TECHNOLOGY ENHANCED
LEARNING INTEGRATION INTO
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This book presents the results of the research which helps organisations to understand how to make transition from traditional learning to technology enhanced learning (TEL).

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ACKNOWLEDGEMENT

There is no doubt that application of digital technologies is one of the drivers of success of an organisation. For a number of years members of a group of researchers at Vytautas Magnus University have applied technologies in their practical work, teaching and learning process, and searched for the best ways of their implementation. The accumulated experience allows us to state that technology enhanced learning (hereinafter TEL) has been implemented in higher education institutions, as well as in other education organisations, either in a fragmented way, using standardised TEL environments and systems, or in a unified manner, but without due respect to the peculiarities of the organisation. The curriculum of the TEL is often designed without taking into account target group needs, and the impact of such curriculum upon innovative activity of the organisation is not assessed. The same conclusions can be applied to the organisations whose major aim is not education, but which use and implement information communication technologies for the development of their processes, communication, and staff professional development.

The study aimed at presenting the complexity of TEL implementation in various organisations, searching for commonalities and researching separate organisational cases. Three types of organisations were analysed (education, business and community) with regard to open education resource reality, its impact upon innovative activities in organisations; the influence of technology integration upon staff competence in organisations; the change of teaching and learning methods applying TEL curriculum.

The study is the outcome of the efforts contributed by a group of researchers – Airina Volungevičienė, Elena Trepulė, Vilma Žydžiūnaitė, Aušra Rutkienė,

Alan W. Tait, Lina Kaminskienė, Sigitas Daukilas, and also by our doctoral students Gintaras Arbutavičius, Daiva Abromavičienė, and Judita Kasperiūnienė. Not all the researchers are the co-authors of this monograph, but everyone's contribution has been of utmost importance. I express my sincere gratitude to all of you. I would also like to extend my exceptional appreciation to prof. Alan W. Tait from the Open University (UK) and thank him for his support and advice in our attempts to adapt the best international examples and seek for the best quality.

We hope that the research results will be beneficial to organisations which aim at consistent and systematic implementation of TEL solutions or development of the current processes.

Margarita Teresevičienė
Project coordinator

FOREWORD

It is a great pleasure to contribute a Foreword to this valuable and important book. The book offers guidance about the transition to Technology Enhanced Learning (TEL), that is to say for the adoption of digital technologies for learning. While the primary academic team responsible for the book from Vytautas Magnus University, Lithuania, working in Higher Education sector, the book has also drawn in the research which lies behind it from business and community organisations who no less importantly must manage the transition for professional updating and education, as well as in core business functions. This broad span of focus is first of the singularly valuable aspects of this work.

The second aspect which should be brought to the reader's attention is the fact that the proposals for managing change derive from the academic team's empirical research. In other words, there is wisdom grounded in real-world understanding that underpins this work.

The book is timely in many ways. Above all, I suggest it is important at this time as we have moved past the tipping point where the adoption of digital technologies for the purposes of learning and teaching is the province of only the most innovative projects or restricted to the world of distance and e-learning. Digital technologies are now widely in use, and at the same time new enough still be the domaine of a wide range of experiments. It is a field where much can be achieved, much can go wrong, and real innovation can take place. While some 10 years ago learning management systems (LMS) were deployed almost solely in e-learning contexts, many campuses, perhaps the majority, now use them. Students on-campus access their learning resources in the

form of study modules, course readings and digital library resources through the LMS, send their work for assessment to the LMS, and communicate with their professors and with each other by email and other messaging systems. Teaching materials now include video and audio and other multi-media, and direct students outwards to the web to find and evaluate resources. Learning analytics monitor student progress using data management systems to underpin interventions to individual students in need. All this is within the formal campus-based sector.

The ways in which the digital revolution enabled informal learning and mobile learning is even greater. Every city in Europe is full of people in cafés, on buses, in airports, at home and in the office, investigating topics of interest to them of every variety personal and professional, using the web.

For many educational institutions, however, the transition remains daunting: how to capitalise on the opportunities for learning and teaching that the digital revolution offers, how to engage students for many of whom it is already a natural medium, and how to motivate and equip staff to change styles of teaching that are centuries old, and which embody professional status, as well as habit. While the term 'digital native' has come under proper critical scrutiny, for the great majority of students leaving school to go to post-secondary education or the workplace, the web is already where they meet old friends and make new ones, investigate and research, discuss important issues both public and private, buy and sell, game, do politics and campaigning, and more generally relax.

For older students in lifelong learning contexts the picture is much more complex, and for much of the last 20 years questions of access have engaged and divided educators. Which cohorts of students are being excluded as digital technologies are introduced? Research tells us that digital exclusion applies principally to 3 domains: the poor, the rural, and the elderly. All three categories are likely to decline in their sharpness over the next 20 years, as technologies become cheaper, broadband reaches further and further out into the countryside, and as the 40 and 50 year olds become the new elderly but with digital competences. However that future is not yet with us. But we are now long past being able to offer programmes of study for the majority that do not include the use of digital resources and demand the development of

digital skills, and there are few remaining voices who still argue we should not use TEL, or online and e-learning. To do so would leave graduates with qualifications that did not equip them for life, either in personal or professional terms, and to fail to engage students for whom the print environment is longer by any means their primary one. The core question now is how best to employ TEL, which is the focus of this book.

That is the background to the need for educational institutions to have access to the analysis in this book of how to manage the transition to TEL. The contents of the volume derive, importantly, from research, which provides an empirical foundation for the conceptual analysis. The approach proposes a framework for integrating TEL based on a number of platforms. These include, crucially, a focus on the 'soft' issues such as the psychological factors that support or impede technology acceptance, and the challenges for teachers in changing practice. Managing the change process across these dimensions is extremely challenging and the effectiveness and quality of work here can, as is clear from the discussion, determine the effectiveness of what is achieved. The 'hard' dimensions are also addressed, of systems across a range of dimensions of technology, administrative support, learner and teacher support, quality assurance and marketing. These approaches are integrated in a range of case studies of very different types, namely an educational institution, a business organisation and a community organisation. These case studies provide a grounded set of readings where the reader can test his or her understandings of the concepts they have been introduced to.

In summary, this volume provides new insights into a change process of central importance to our learners, students and employees, and to our societies built on the pillars of education, business and community organisations. I am very pleased to have had the chance to be associated with the work here, and to recommend it now to colleagues.

Alan Tait
Professor of Distance Education and Development
The Open University, UK
February, 2015

INTRODUCTION
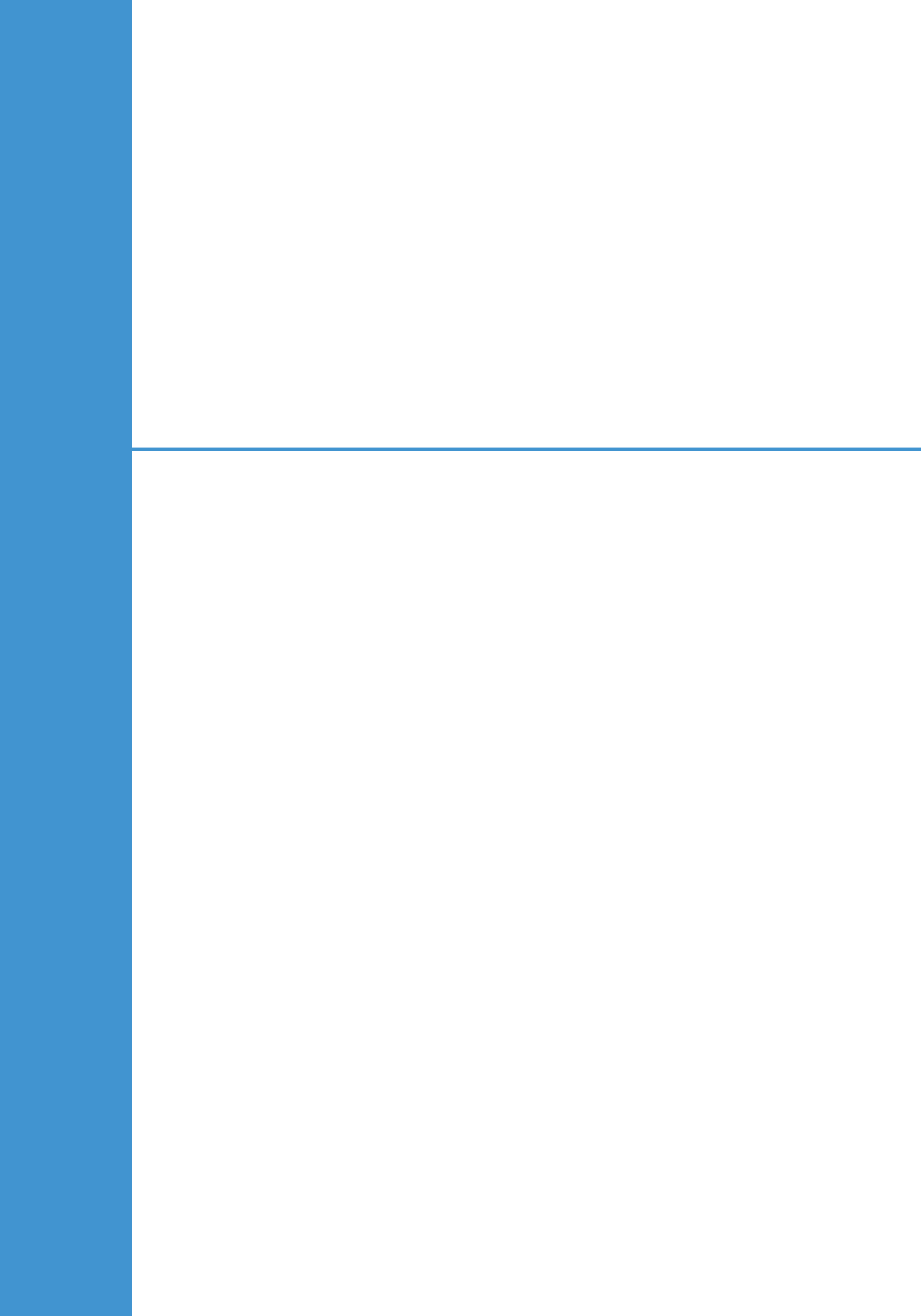
International contexts emphasise cooperation of education and business in search for bilateral profit and science, integration of studies and innovation. Education establishments can contribute to the business development and economic growth through research that is relevant to the business world. While business enterprises lack empirically supported information for their development, launching of new products or ideas, staff change and continuous learning and development.

Big enterprises have wider opportunities for cooperation with different partners; their employees' development needs are analysed and met. Small and middle-sized enterprises, community organisations often lack financial resources to develop their business based on scientific research, as well as to provide training for their employees, e.g., employees lack opportunities to leave their work place in the time of learning. In the European Union (EU) business organisations action learning, e-learning, distance learning and blended learning (generally – technology enhanced learning) are taking over and serve to solve the mentioned problems.

The mission of education institutions – to ensure up-to-date learning service provision – has been facilitated by technology enhanced learning (TEL). The level of the application of TEL into various organisations is a result of many multidimensional external and internal factors. Researchers analyse these factors from different perspectives: environmental challenges (Bottomley, 2000; Schneckenberg, 2010; Wagner, Hassanein, Head, 2008), which include changes in society, economy and social sphere; changes which might be classified as learners' level challenges, such as intrinsic and extrinsic motivation (Ellis,

Hubble, Applebee, Peat, 2006; Robles, 2013); challenges related to institutional (organisational) infrastructure, support, policy (Bottomley, Spratt, Rice, 1999; Boezerooij, 2006; Cook, Ley, Crawford, Warner, 2009; Schneckenberg, 2010), and other areas. External factors affecting changes in education institutions, as well as private enterprises are related to the development of information and communication technologies (ICT), with stronger focus on the use of technologies in everyday activities. Global processes such as globalisation of economic systems, globalisation of high skilled force, expansion of ICT, digital *taylorism* (Brown, Lauder, Ashton, 2011) make organisations reconsider their strategies.

TEL implementation into education institutions is in a more advanced position, while in business organisations TEL is still in its infancy. Researchers are identifying success factors which affect the designing of TEL frameworks, models for organisational context (Nichols, 2008; Elliot, & Clayton, 2009) and the results show (Liu, Huang, Lin, 2012) that management support, organisational learning culture and institutional policy are essential for the implementation of TEL. It is clear that the integration of TEL needs careful and systematic planning to ensure success. Minnaar (2013, p. 104) analysed how to implement open and distance learning (which findings are relevant to TEL) within a university. His findings show that planning starts with strategic planning, followed by the development of TEL policies for alignment with efforts, strategies, and processes.

New technologies have altered the way learners interact with instructor and their peers. Research results prove that internet as online interaction and internet self-efficacy are significant factors for learners' satisfaction in online learning settings (Kaminski, Switzer, & Gloeckner, 2009; Yu-Chun Kuo, Andrew E. Walker, Brian R. Beland, & Kerstin E. E. Schroder, 2013). Usefulness and ease of use are compulsory features for different TEL forms (Sela & Sivan, 2009). TEL environment quality is positively related to TEL service quality (Kettinger, Park, & Smith, 2008). Easy to use systems give users a greater perception of usefulness and promote a positive attitude towards the system, which implies that a system with better quality (such as better response time, reliability and accuracy) can deliver better services. ICT can improve access, equity, and quality of professional learning opportunities, at the same time

establishing online cohorts of teachers in courses. Employing technologies provides rich interactions and ongoing or work-embedded support (Robinson, 2008; Dede, Ketelhut, Whitehouse, Breit, & McCloskey, 2009, p. 9).

Rovai (2002), Thompson & MacDonald (2005), and Shea (2006) explain the role of community that supports online learning in relation to three elements: social presence, teaching presence, and cognitive presence. Social presence is understood as the degree to which learners feel socially and emotionally connected with others in virtual environment; cognitive presence means the ability of learners to construct and confirm meaning through sustained discourse and reflection; teaching presence means the design, facilitation, and, most importantly, the direction of cognitive and social processes in order to achieve learning outcomes.

The strategies and actions taken for implementation of TEL vary depending on the country, prior experience, and other prerequisites established at each individual institution and the country. The interests of the majority of institutions target at improving transparency and quality of learning services, modernizing curriculum by TEL affordances, and meeting the needs of their target learners. A very rapid development of technological devices and software has been another driving force for decades. Society became more and more interactive with the help of mediated communication tools at hand. Learners became aware of the possibilities to receive learning content at any time and in any place, however organisations are not ready for such services. Another existing problem is that even in science and study organisations, the use of technologies is fragmented, related to standardised TEL environments and systems, or unified, not tailored to the type of organisation. TEL curriculum is not being tailored to the target group needs and the impact of this curriculum on the organisation's innovative activities is not being estimated.

Concept of technology enhanced learning

Technology enhanced learning (TEL) or technology enabled (supported) learning does not have a commonly accepted precise definition. According to Kirkwood and Price (2014), the term *technology enhanced learning* is used to

describe the application of information and communication technologies (ICT) into teaching and learning, also to describe a broad approach to using technology to support teaching and learning processes, design and delivery, to enhance learning. TEL has a potential to transform education and to raise the level of education globally. TEL is inclusive of and is broadly synonymous with e-learning, distance learning, online learning, multimedia learning, internet based training, web based training, and etc. However, TEL is a broader concept than e-learning, and it refers to the use of electronic media and ICT in education.

According to Anderson & Dron (2012), "distance education evolved from a Gutenberg era print and mail system to one that supports low-cost, highly interactive learning activities that span both time and distance with equal facility" (p. 10). Distance education, according to the authors, does not follow a single paradigm mode, but is rather diverse and depends upon pedagogical solutions. The authors provide arguments for the classification of distance education pedagogy into three generations of pedagogies that provided solutions for technology affordances and learning scenarios.

E-learning is the most popular form of TEL service in universities, vocational education and training, as well as adult learning institutions. According to Govindasamy (2002), many institutions use e-learning to solve authentic learning and teaching problems.

Mobile learning is related to mobile equipment and its proliferation, consequently, to the growth of possibilities to use these mobile devices and medium which is natural for increasing generations of youth. In fact, mobile learning is considered to be a relevant measure rather than a goal. Mobile equipment itself is not useful in terms of education; therefore, it is relevant to explore its pedagogical value (Bento da Silva *et al.*, 2013) in order to use it in a meaningful and efficient way for interactive learning based on cooperation. Provision of learning resources for mobile learning can enhance the emergence of new teaching methods and practices which will respond to concrete features of these devices. This area is arousing interest among researchers and practitioners and is developing consistently together with the changes in mobile technologies.

Since the first years of the twenty first century the new types of technology called web 2.0 have been implemented. Teachers can use this technology without

technician's assistance. It is now possible to use various design templates for publishing the content online free of charge (because no designer assistance is needed), teachers can upload materials online (no specific programmer skills are needed). Web 2.0 tools make TEL successful when the teacher knows his/her subject, is creative, has cooperation and collaboration skills, is open and shares his/her knowledge and skills peer to peer. Learners can control their own data and other learning material. New technologies enable the transfer of all previous content stored on computers to internet space.

Blended learning is the most popular form of TEL. Garrison & Kanuka (2004), Laurillard (2002) and others proved that integration of blended learning in an organisation is an effective and low-risk strategy for an organisation to re-conceptualise and reorganise pedagogical strategies, even though all blended model designs are absolutely different and no identical strategies exist. However, the unique characteristic of using blended learning introduction approach within an institution is that there is one very significant factor – i.e., engagement of academic community.

Besides on-line learning, e-learning and distance learning (which dominated for the last decades), new forms of TEL emerge. Universities introduce innovative solutions, like Open Educational Resources to widen participation possibilities (Atkins, Brown, Hammond, 2007; Lane, 2008) or virtual and blended mobility forms to contribute to intercultural and multilateral collaboration scenarios (Volungevičienė, Teresevičienė, Daukšienė, 2011). TEL concept has significantly changed the existing dominating practices, introduced innovations and continues changing the landscape of learning services at education institutions. Today TEL concept already carries emphasis as a broader one than previous online, distance and e-learning, and it should be re-considered in the light of common practices.

Research methodology

The integration of TEL into organisations remains a challenge. Good practice experience cannot be directly transferred to new organisations due to different contextual conditions. TEL integration depends a lot upon a very rapid

development of services and ICT themselves. Some organisations managed to go step by step with the development and became leaders in TEL provision. However, others, though having successful examples, did not succeed to reach service uptake they wanted. Even though a lot of examples exist in scientific literature, it is a rare case that institutions had complete strategies or solutions to integrate TEL meeting their specific pre-conditions and meeting quality assurance parameters at the same time. Some organisations have experience in planning and preparation of TEL curriculum, which is underestimated in other education, business and community organisations, because there is a lack of research and implementation of new technology enhancement in teaching and learning solutions.

Globalisation and industrialisation of education, caused by different new forms of open, innovative, massive non-formal and informal learning, as well as by networked society, increased and caused tremendous growth of the number of actors in the field of education services. New forms of online and open education (such as massive open online courses (MOOCs)) opened the way to integrate the innovation, contributed to validation of new forms of online learning, but also brought negative side effects which were discussed recently in European arena. Most of the massive online courses lack consolidated expertise and experience in open, distance and online learning due to the fact that inadequate theoretical frameworks have been applied or established quality learning practices have been ignored. This has misled many to precocious scepticism and disillusion about the potential of open education.

A broader concept of TEL has emerged out of e-learning, on-line learning and distance education. The new TEL concept implies the value of judgment of improved learning services for learners and new, innovative scenarios in learning and teaching. Though new forms of TEL, like OEP (Open Educational Practices), emerge, blended learning forms remain to be the safest for organisations. Mainstreaming of open education implies necessarily some sort of regulation in the field (most probably ongoing in the field of TEL, online and open education) which calls for the need to research new phenomena in the field of TEL and suggest TEL integration framework to be consolidated and adjusted to unique settings of an organisation.

The aim of the research is to design the framework of technology enhanced learning integration into organisations.

The aim of the research is divided into the following objectives:

1. To create a framework of responsible and responsive technology enhanced learning integration into organisations.

2. To implement the framework of technology enhanced learning integration into three types of organisations (vocational education and training (VET), business and community organisations).

Research methodology is based on the implementation of social constructivism and connectivism ideas to identify motivational factors for effective teaching and learning interaction, reflecting qualitative learning patterns that allow to deeper comprehend and explain:

• commonalities of personal and organisational activities and teaching/learning curriculum;

• factors of meaningful teaching/learning focused on learner's EGO level;

• factors of interactive teaching/learning;

• effective communication models.

Theories of connectivism and social connectivism are related to teacher practical activities, where they apply theories in a flexible way aiming at understanding and planning teaching and learning. Teaching and learning theories are based on a premise that teachers teach learners in classes or auditoriums, but they do not provide them with the framework necessary for thinking and acting in the ways related to the world they live (Siemens, 2003, 2004; Thomas, 2008). Therefore, the need arises here to reflect on the theories of connectivism and social connectivism, and application of their components in the teaching and learning both face to face and virtually.

Connectivism based theories about learning in networking (Goodyear, 2001; Cormier, 2008) and society (Castells, 2000) have been created to explain the impact of ICT upon (self-) education, commerce and society in a common sense. Learners, teachers, leaders/managers and politicians attempt to integrate technologies into learning in formal and non-formal settings, searching for

theories which could inform about teacher's and learner's actions (Wiley and Edwards, 2002). To a great extent connectivism is included in Downes' (2005) theory about connecting knowledge. However, both Siememns and Downes agree with the opinion that learning has been rapidly intertwined with the use of technologies and we have to understand how much changes affect our knowing and acting.

Research methods

The following research methods were used in this research:

I. Theoretical literature analysis which was the background of the research and contributed to the definition of technology enhanced learning integration framework criteria groups.

II. Qualitative analysis of content as a qualitative inquiry was used as a research method. Expert interview was used to define TEL integration criteria groups and TEL integration framework parameters.

III. Quantitative research method (using a questionnaire survey) was used in order to find out the possibilities to integrate TEL into different types of organisations.

IV. Case study (three cases reflecting three different types of organisations) method was used to implement TEL integration and to test TEL integration framework in three types of different organisations (vocational education and training, business and community).

Qualitative analysis of content as a qualitative inquiry research

Sample. 10 experts from European Professional organisations (European Distance and E-Learning Network, EDEN, and European Foundation for Quality in e-Learning, EFQUEL) participate in the research data collection and analysis. The age of experts ranged from 27 to 55 years old and professional experience in distance and e-learning from 5 to 15 years. They represented the following countries: Italy (2), Slovenia (1), Germany (1),

Hungary (2), Lithuania (2), Belgium (1), and the Netherlands (1). This group (further referred to as IEG) participated in both data collection, as well as inductive and deductive analysis of research data. Another group that participated in data analysis only consisted of 12 experts from Lithuanian Distance and e-Learning (LieDM) association. The experts represented professionals from adult, vocational education and training, and higher education institutions. All 12 experts were professionals working in distance and e-learning for more than 10 years. Their age ranged from 38 to 58 years old. They occupied responsible positions in the organisation of distance and e-learning in adult, vocational education and training, and higher education organisations in Lithuania. This group will be referred further in the text as NEG.

Data collection. Following Marchall and Rossman (1998), two methods for data collection were used: 1) analysis of documents and materials, and 2) group discussions (which were expert discussions in this research).

For *data analysis* method – inductive versus deductive research method was used (Savin-Baden & Mayor, 2013). The phases of data collection and analysis, as well as their sequence, are presented in Table 1.

Tools. Collaborative online tools were used for data collection and analysis during the whole process of research. Google documents and forms, as well as MS Excel sheets were used for this purpose. Qualitative research data was entered into the document after each phase. The key questions addressed and highlighted during the meeting with IEG or NEG were "How is TEL introduced into an education institution, what are the stages and important factors, what are the quality criteria of this process?" All IEG and NEG meetings were recorded and data collected were inductively inserted into the document. If experts were not able to participate in the meeting, the online form was sent to them to be filled in with the open answer. These answers were again transcribed and copied into data collection document.

During data analysis phases, the data were deductively analysed and intermediate results were presented in the collaborative working document (Google Doc or Excel sheets). All editing versions were saved and reviewed during data analysis, and editing history was used. Online collaborative documents were used among these two groups only.

Table 1. Phases of data collection and data analysis process.

Data collection process	Data analysis process
1. IEG implemented internal meetings with their organisations in order to review existing regulations for technology enhanced learning. First data were selected for IEG meeting discussion.	During the first IEG meeting, the data were analysed and inductive versus deductive analysis was made in order to define the first categories of quality features for technology enhanced learning integration into an organisation.
2. IEG implemented literature analysis and collected data on TEL quality assurance characteristics.	IEG met to analyse the data and to implement inductive versus deductive analysis on TEL curriculum theoretical and empirical quality assurance characteristics.
3. IEG organised national seminars with TEL target groups in order to collect data on quality assurance requirements for TEL.	IEG shared the results and implemented data analysis by measuring the relationships of single criteria with the categories of quality assurance called criteria groups.
4. IEG presented quality criteria to their national and institutional experts for data validation.	IEG members brought feedback from national expert groups and finalised quality assurance categories for TEL integration.
5. NEG collected data on the quality characteristics in terms of quality criteria (features) for TEL implementation in vocational education and training, adult education and higher education institutions.	NEG gathered to review the results of experts from national vocational education and training, adult learning and higher education organisations to establish relationships of criteria and to group individual criteria into criteria groups.

Ethics. All data collection and data analysis records were used anonymously outside the groups. Data collection was implemented using all ethical standards and rules. If data was collected during international expert group meetings with other professionals, outside the group, all discussions were recorded and transcribed anonymously for research purposes only.

Quantitative research

Quantitative research method (using a questionnaire survey) was used to find out the possibilities to integrate TEL in different types of organisations

The research data was collected using an online questionnaire survey as a method of quantitative research (see Annex 1). This research method was chosen in order to collect as much information about all employees of an organisation as possible, aiming to ensure anonymity and to avoid any impact upon the research respondents. As TEL was the analysed object, the questionnaire was posted on the internet website, thus relating it directly to the research respondents' skills in applying TEL.

Data collection and analysis

A quantitative questionnaire survey was formed, apart from the main variables from theoretical analysis (presented in Annex 1). The questionnaire was posted on the internet (in Google survey area). The data was collected in May-June 2014. The respondents were anonymous with regard to researchers, as not only the instrument was anonymous but also its sharing and information collecting: the survey was administered on the internet on the basis of a voluntary principle of the respondents.

Later all collected surveys were coded and processed using the SPSS (Statistical Package for Social Sciences) programme for further analysis. The analysis was performed applying appropriate statistical methods, using MS Excel and SPSS Version 22. To generalise the data, descriptive statistics, parametric and non-parametric criteria, reliability calculations were applied. Hypotheses were verified choosing the level of significance at $\alpha=0.05$. Data analysis was performed using descriptive statistics (frequencies, percentage, graphical representation), parametric statistics (analysis of variance ANOVA), reliability calculations (Cronbach α, Guttman coefficients), and non-parametric criteria (Kruskal-Wallis one-way analysis of variance); calculation of response index. For each block (integration criteria groups) a summarised indicator was calculated, as the sum of responses presented by the respondents to each of the provided seven criteria groups. As each questionnaire consisted of

10 questions, with the response value from 1 to 5, the range of changes in the assessed criteria group index was from 10 to 50. Seven indexes were calculated for each respondent which reflected each respondent's evaluations. Further analysis of the respondents' evaluations used these constructed indicators which are called indexes hereinafter.

Tool

Research instrument was a 7 block questionnaire; each block consisted of 10 questions:
1. Strategy and management;
2. ICT infrastructure;
3. TEL curriculum;
4. Continuing professional staff development;
5. Support systems;
6. Quality assurance procedures;
7. Marketing and business.

All research fields are based on theoretical analysis to ensure content validity. Internal consistency was estimated by calculating Cronbach α value. The total Cronbach α value of the whole questionnaire is 0.978 – which shows a very high internal consistency indicator appropriate for the analysis. Indicators of internal consistency of separate parts of the questionnaire are presented in Table 2.

Table 2. Cronbach α values for separate parts of the questionnaire

Parts	Cronbach α
Strategy and management	0.913
ICT infrastructure	0.920
TEL curriculum	0.923
Continuing professional staff development	0.901
Support systems	0.932
Quality assurance procedures	0.932
Marketing and business	0.834

High Cronbach α values for separate parts of the questionnaire indicate good internal consistency of the questionnaire. To check the additional consistency of the questionnaire, a method of split-half was employed: Cronbach α of part one is 0.961, of part two Cronbach α = 0.958. Mutual correlation of parts equals to 0.869; Guttman split-half coefficient equals to 0.930 (good consistency is indicated by value higher than 0.8).

Sample selection

The research sample was chosen according to the identified target organisations, where case study analysis was planned to be performed in: community, education and business organisations. The necessary sample size was calculated applying Yamane's formula (G. D. Israel[1], 2013) and its correction. Initial sample size was calculated according to the formula (here z is a quantile of the standard normal distribution level of 0.05, equal to 1.96; e is the desired level of precision, for the selection of a sample in this research, a 5 percent margin of error was applied; p and q equal 0.5, as this way, if distribution is unknown, a maximum size of sample is obtained):

$$n = \frac{z^2 \cdot p \cdot q}{e^2} \approx \frac{1.96^2 \cdot 0.5 \cdot 0.5}{0.05^2} \approx 384 \qquad n = \frac{z^2 \cdot p \cdot q}{e^2} \approx \frac{1.96^2 \cdot 0.5 \cdot 0.5}{0.05^2} \approx 384$$

Thus, the research aimed at surveying at least 384 respondents.

Limitations

The research focused on the same target audiences where the case analysis was performed; therefore, respondents working in the area of information communication technologies were surveyed as business organisation representatives; and employees of vocational education and training institutions were surveyed as representatives of educational organisations. Representatives of community organisations were persons who live in rural communities. Consequently, generalisations can be applied only to such type of organisations that research was performed in.

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[1]   http://edis.ifas.ufl.edu/pdffiles/pd/pd00600.pdf

Sample

Out of 466 respondents who participated in the research only a little more than half were females (307 respondents or 65.9 percent), the rest were males.

Table 3. Distribution according to gender

Gender	Number	Percent
Female	307	65.9
Male	159	34.1
Total	466	100.0

The youngest respondent was 18 years old, the oldest – 70, the average age was 38.18 (st. deviation 11.11), the lowest work experience in years was – 0, the highest – 45 years, the average work experience was – 8.63 years (st. deviation 8.13).

The absolute majority of the research participants had higher education (362 respondents out of 466).

Table 4. Distribution according to educational background

Educational background	Number	Percent
Higher	362	77.7
Unfinished higher	16	3.4
Post-secondary vocational	51	10.9
Vocational	7	1.5
Secondary	30	6.4
Total	466	100.0

The research participants represented organisations of various sizes. However, mostly big size organisations were represented, i.e., those enterprises which employ more than 200 employees. The number of respondents from smaller organisation groups was almost equal (Fig. 1)
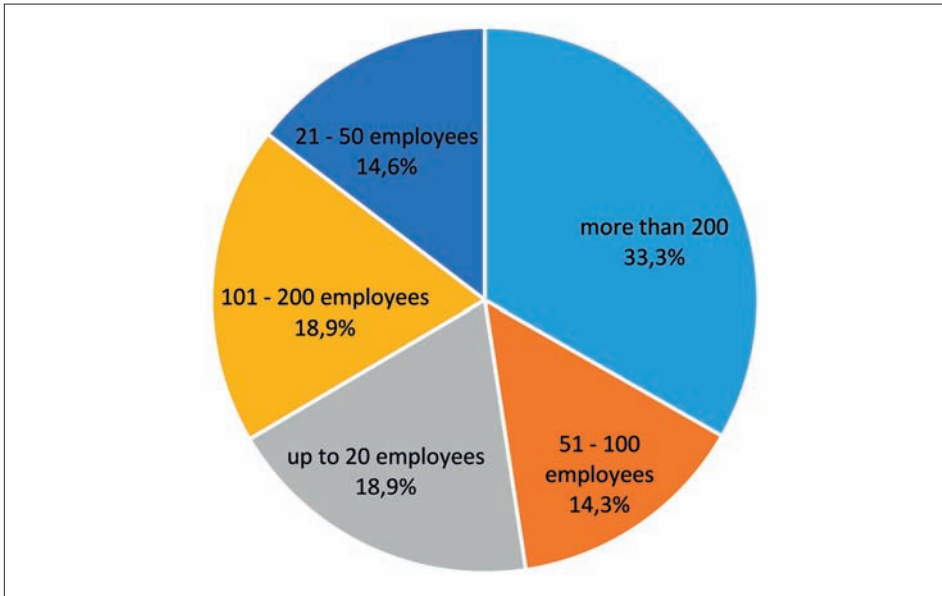
Figure 1. Size of organisations

The research respondents were purposefully selected from organisations of three types: community, education and business. The distribution of the respondents from all three types of organisations was almost equal: 158 respondents were from community organisations, 153 from education and 155 from business organisations.

The distribution of the respondents according to the gender, age, work experience and educational background in different types of organisations is presented in Table 5.

The prevailing tendencies with regard to the distribution according to the gender are similar in all types of organisations – females comprise the major part of the employees. Part of senior age persons prevails in educational organisations (consequently, with increasing duration of work experience), whereas in community and business organisations a great part of the respondents are young, under 31 years of age. Educational background of Community organisation representatives is diverse, i.e. from secondary to higher education, whereas representatives of education and business organisations were mainly those with higher education.

Table 5. Distribution according to the gender, age, work experience and educational background in different types of organisations

	Community organisations		Educational organisations		Business organisations	
	Number	Percent	Number	Percent	Number	Percent
Gender						
Females	109	69	117	76.5	81	52.3
Males	49	31	36	23.5	74	47.7
Age						
18–31	72	45.6	20	13.1	65	41.9
32–42	46	29.1	52	34	60	38.7
43 and over	40	25.3	81	52.9	30	19.4
Work experience						
Up to 4 years	71	44.9	18	11.8	63	40.6
4–9 years	53	33.5	49	32	58	37.4
10 and over	34	21.5	86	56.2	34	21.9
Educational background						
Higher	67	42.4	143	93.5	152	98.1
Unfinished higher	16	10.1	0	0	0	0
Post secondary vocational	39	24.7	9	5.9	3	1.9
Vocational	6	3.8	1	0.7	0	0
Secondary	30	19	0	0	0	0

Case study

The case study method was used to implement TEL integration and to test TEL integration framework in three types of different organisations (vocational education and training, business and community). The case study focuses on

one or several cases, and simultaneously takes account of the context, and so encompasses many variables and qualities.

Definition of a case study. The case study is an empirical inquiry that investigates a particular phenomenon, when the boundaries between phenomenon and context are not clear, and in which multiple sources of evidence are used (Yin, 1984). The case study method enables a researcher to closely examine the data within a specific context. In most cases, a case study method selects a very limited number of the subjects of the study. Case studies explore and investigate contemporary real-life phenomena through a detailed contextual analysis of a limited number of events or conditions, and their relationships (Zaidah, 2007). The case study research is not a sampling research (Tellis, 1997).

Design of a case study. Case studies are designed to bring out the details from the viewpoint of the participants by using multiple sources of data (Tellis, 1997). Researchers can adopt either a single-case or multiple-case design depending on the issue in question. In cases where there are no other cases available for replication, the researcher can adopt a single-case design. A multiple-case design can be adopted with real-life events that show numerous sources of evidence through replication rather than sampling logic (Zaidah, 2007). The case study is known as a triangulated research strategy. Triangulation can occur with data, investigators, theories, and even methodologies (Feagin et al., 1991). The need for triangulation arises from the ethical need to confirm the validity of the processes. In case studies this could be done by using multiple sources of data (Yin, 2009).

Denzin et al. (2008) identified four types of triangulation: i) *Data source*, when the researcher looks for the data to remain the same in different contexts; ii) *Investigator*, when several investigators examine the same phenomenon; iii) *Theory*, when investigators with different viewpoints interpret the same results; iv) *Methodological*, when one approach is followed by another to increase confidence in the interpretation.

Yin (2009) suggested three principles of data collection for case studies: a) use multiple sources of data; b) create a case study database; c) maintain a chain of evidence. The rationale for using multiple sources of data is the triangulation of evidence. Triangulation increases the reliability of

the data and the process of gathering it. In the context of data collection, triangulation serves to corroborate the data gathered from other sources (Tellis, 1997).

The data that are collected during this phase need to be organised and documented just as it is in experimental studies. The two types of databases that might be required are the data and the report of the investigator. The design of the databases should be such that other researchers would be able to use the material based on the descriptions contained in the documentation. All types of relevant documents should be added to the database, as well as tabular materials, narratives, and other notes (Tellis, 1997).

Categories of a case study. Case studies are multi-perspective analyses. This means that the researcher considers not just the voice and perspective of the actors, but also of the relevant groups of actors and the interaction between them (Tellis, 1997).

There are several categories of a case study. Yin (2009) mentions three categories:

i) *Exploratory* case studies set to explore any phenomenon in the data, which serves as a point of interest to the researcher. Exploratory cases are sometimes considered as a prelude to social research.

ii) *Descriptive* case studies set to describe the natural phenomena, which occur within the data in question; the goal set by the researcher is to describe the data as they occur. Descriptive cases require a descriptive theory to be developed before starting the project.

iii) *Explanatory* case studies examine the data closely both at a surface and in a deep level in order to explain the phenomena in the data; explanatory cases are also deployed for causal studies, where pattern-matching can be used to investigate certain phenomena in very complex and multivariate cases. Explanatory case studies may be used for doing causal investigations.

Stake (1995) adds three other types of case studies such as:

• *Intrinsic* – when the researcher has an interest in the case.

• *Instrumental* – when the case is used to understand more than what is obvious to the observer.

• *Collective* – when a group of cases is studied.

The unit and the process of case study implementation or application. The unit of analysis is a critical factor in the case study. It is typically a system of action rather than an individual or group of individuals. Case studies tend to be selective, focusing on one or two issues that are fundamental to understanding the system being examined (Tellis, 1997; Hensler *et al.* 2000). The case study research proposes six steps that should be used (Yin, 1984; Hamel *et al.*, 1993; Wholey *et al.*, 1994; Stake, 1995): 1) determine and define the research questions; 2) select the cases and determine data gathering and analysis techniques; 3) prepare to collect the data; 4) collect data in the field; 5) evaluate and analyse the data; 6) prepare the report.

What types of cases did we choose for our case studies? We could not hope to reflect the full diversity of TEL learning actions with three institutional cases; therefore, we decided to focus on three case types from education, business and community organisations. We wanted to study a mix of TEL experiences within the three institutions we selected. Although we oriented ourselves to institutional types, the information was collected from individually realised quantitative surveys, interviews and focus groups.

How did we choose our case studies? The overarching point to note about our case selection process is that the process was not random but as impartial as we could make it. As we wanted to focus our attention on TEL experiences in education, business and community organisations, we excluded cases from other types of organisations.

What kind of sources did we use to search for particular information? The process was implemented in three steps:

1. The semi-structured interview was applied in order to reveal the possibilities to integrate the Technology Enhanced Learning (TEL) curriculum into the three chosen organisations (cases).

2. The small-size survey was implemented in every organisational case in order to highlight the needs for TEL curriculum integration.

3. The document analysis was performed in order to highlight the situation of readiness to implement and manage the TEL curriculum in the chosen organisational case.

What kind of methods did we use for data analysis? Quantitative data analysis was implemented through calculating descriptive statistics. The

qualitative and quantitative data analyses were summarised by applied descriptive content analysis. Descriptive content analysis examines quantitative and qualitative data collected through methods, such as document analysis, interviews or surveys, with the aim of summarising the informational contents of the data with respect to the research questions. The informational content is presented in a straight and descriptive summary, structured according to the needs of the study (Feagin *et al.*, 1991).

The steps of the descriptive content analysis were as follows (Denzin *et al.*, 2008): i) defining the research questions; ii) review of the collected data (excerpts from document analyses, interview transcripts, survey and questionnaire evaluation reports) with respect to the research questions; iii) identification of the informational content with respect to the research questions; iv) preparation of a concise descriptive summary of the key information contents.

For the data analysis in our research, the following quality criteria were applied for the integration of TEL curriculum into organisation[2]:

1. Strategy and management;
2. ICT infrastructure;
3. TEL curriculum;
4. Continuing professional staff development;
5. Support systems;
6. Quality assurance procedures;
7. Marketing and business.

Advantages of a case study. There are a number of advantages in using case studies. First, the examination of the data is most often conducted within the context of its use (Yin, 2009), that is, within the situation in which the activity takes place. Second, variations in terms of intrinsic, instrumental and collective approaches to case studies allow both quantitative and qualitative analyses of the data (Zaidah, 2003). Third, detailed qualitative accounts often produced in case studies not only help to explore or describe the data in real-life environment, but also help to explain the complexities of real-life situations which may not be captured through experimental or survey research (Zaidah, 2007).

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[2] http://www.reviveproject.eu/vet/quality-criteria/revive-vet-curriculum-design-quality-criteria/

Disadvantages of a case study. Yin (1984) discusses three types of arguments against case study research. First, case studies are often accused of lack of rigour. Second, case studies provide very little basis for scientific generalisation since they use a small number of subjects, some are conducted with only one subject. Third, case studies are often labelled as being too long, difficult to conduct and producing a massive amount of documentation. Yin (1993) considered case methodology 'microscopic' because of the limited sampling of cases.

Target organisations

Education organisation

The education institution which participated in the research is a modern and dynamic education institution, which responds to labour market changes rapidly and responsibly, and applies innovative forms of education bravely. Qualified specialists employed in the Centre of Vocational Training and Education (hereinafter CVET) provide qualitative services of formal and non-formal education (initial vocational education and training, lower secondary (Grades 9 and 10) and upper secondary education, adult education, pre-school education), offering attracting and perspective specialities which are acquired in premises allocated for practice and equipped with modern technologies. Teaching is carried out in *beauty, health care, social well-being,* and *business service* areas according to 20 secondary vocational education and training programmes. A particular attention is devoted to nurturing of Christian values and developing general competencies.

The mission of the Centre for Vocational Education and Training is sociality for lifelong learning aiming at professionalism as responsibility for the performed work. Its **vision** is a modern centre of vocational education and training, open to innovations and recognised in Europe, which ensures continuity between vocational education levels and grounds its activity on coherence of professionalism and Christian values.

The Centre cooperates with various enterprises, universities, participates in the activity of a number of associations. The Centre was recognised on the

European level and certified as the "**International Education Society" (IES)**. Each student who accomplishes the chosen programme of vocational education and training can acquire an international certificate. The quality of CVET activity has been assessed according to LST EN ISO 9001:2008 standard.

Business organisation

A representative of business organisation in this research is an ICT company which has more than sixteen years of experience and is one of the leaders in the development of information systems in Lithuanian and foreign markets. The company takes an active part in scientific research activities financed by the European Union funds.

Currently more than 50 employees from different areas work in two of the company's offices in Kaunas and Vilnius: systems analysts, programmers, specialists of quality assurance and documentation, systems engineers, data operators, project managers, teachers, practitioners of law, economics, and others. The company is constantly recruiting new staff and expanding. On demand and according to the specificity of the project, part-time employees and experts of the project are employed. Some of the staff members are working on long-term assignments abroad. During the 16 years of activity, the company has participated and implemented ICT projects in African, Central American, Asian and European regions.

The company's training centre has a considerable experience in organizing information technology and especially computer literacy trainings. It is a certified ECDL (European Computer Driving Licence) training centre included in the civil servants' professional development institutions' list, having trained a number of employees from important public institutions, budget institutions and private companies. The training centre has a highly qualified team of lecturers who apply the latest teaching methods, and fully equipped modern classrooms which allow organising trainings in any city. The centre has created a distance learning system which is used in a variety of training processes. The participants can join the trainings anytime and anywhere where internet connection is. The distance learning system helps the listeners to consolidate knowledge and newly acquired skills. The training

centre adapts and distributes literature – methodological material for each training course.

Community organisation

Research is conducted in a Community Centre (CC) which has been active for almost ten years. The mission of the CC is to encourage community members to be involved in a public life, promote healthy neighbourhood and partnership of all the community organisations, strengthen the traditions of volunteering, represent community interests in the governmental institutions. The main activities of the Community Centre are: building the social capital in the community; promotion of social activities and civic participation; forming the policy of harmonious development and the system of non-formal learning; support and encouragement of community leaders; organisation of clubs and unions according to age groups and interests; adaptation of good practice examples from a foreign community life; organisation of project activities. The Community Centre organises lectures, seminars, courses, annual national adult education week events. Computer literacy courses, lectures and seminars in psychology, politics, healthy lifestyle and other topics organised by the Community Centre are very popular among local community members. The Community Centre collaborates with other institutions and organisations in a township, district education centre, clubs, centres, unions of the disabled, community organisations, is a member of a local rural activity group, a member of the union of Lithuanian rural communities.

There are 49 members in the Community Centre who pay membership fee. There are no employed workers in the CC, all the members work on a voluntary basis. Active members of the community successfully solve community problems and help the township to find its competitive advantage; consequently economic and social climate in the township is friendly. The township is well integrated in the common region situation and could be characterised as having growing economy and population.

Each integration criteria group will be presented and described along with the research results further in this research study.

FRAMEWORK FOR TECHNOLOGY ENHANCED LEARNING INTEGRATION INTO ORGANISATIONS

Scientific literature analysis and expert interview qualitative research resulted in the development of the framework of TEL integration into organisations. The first version of the framework was already published in a scholarly article by Volungeviciene, Tereseviciene & Tait (2014).

However, the research continued and resulted in a broader definition of success factors of TEL integration and extended results, namely, applicability of TEL integration framework into three different institutional case studies (vocational education and training, business, and community organisations).

Having analysed successful innovations and their cases, Tidd and Bessant (2009) provided the following successful innovation implementation criteria identified in their empirical research:

- product advantage (superiority in the eyes of the customer);
- market knowledge;
- clear definition of the product (including target markets, benefits, positioning strategy, product requirements);
- risk assessment (market, technological, manufacturing and design sources of risk);
- project organisation (cross-functional, multidisciplinary teams);
- project resources (financial, material resources, human skills, management and technological skills);
- proficiency of execution (quality assurance and pre-commercialisation business analysis);
- top management support (from concept to launch).

The authors claim that "these factors have all been found to contribute to new product success, and should therefore form the basis of any formal process of new product development" (Tidd and Bessant, 2009, p. 160).

According to Groff and Mouza (2008), there are six critical factors influencing integration of technology and innovations into the classroom: legislative factors (McMillan-Culp, Honey, & Mandinach, 2005, cited in Groff & Mouza, 2008), institutional level factors, factors associated with the teacher (staff in this research, McKenzie, 2003, cited by Groff and Mouza, 2008), technology enhanced project factors (Honey, McMillan, & Carrigg, 1999, cited by Grodd & Mouza, 2008), student factors, and factors inherent to technology itself.

The authors agree on the outcomes of the research and indicate the following obstacles to the successful integration of technology enhanced projects into the classroom: lack of teacher input on the development of innovations, insufficient support in the form of resources, time, professional development, human and technological infrastructure, inadequate institutional culture, teacher attitudes and concerns about technology use – inexperience, technology itself and others (Groff & Mouza, 2008, p. 42).

Having analysed the factors indicated by Tidd & Bessant (2009), as well as critical factors and obstacles named/indicated by Grodd & Mouza (2008), the representation of TEL integration quality criteria groups can be derived and tested (Table 6).

The criteria of risk assessment and TEL organisation have been analysed in the scope of the integration concept rather than parameters for qualitative service development.

Applying the theories of integration of innovation into an organisation, the main of criteria groups TEL integration quality assurance (further to be referred as integration criteria groups) have been identified and listed down in this study in the following sequence: 1) Strategy and management, 2) Information communication technologies and infrastructure, 3) Continuing professional staff development, 4) TEL curriculum, 5) Support systems, 6) Quality assurance, and 7) Marketing and business development.

Table 6. TEL integration quality criteria groups

Theoretically supported successful innovation implementation criteria (by Tidd and Bessant, Groff and Mouza)	TEL integration quality criteria groups (derived)
Legislative (and top management support)	Strategy and management
Technology (and resources)	Information technologies and infrastructure
Teacher (and proficiency of implementation)	Continuing professional staff development
TEL project (also product advantages, clear product definition)	TEL curriculum
Student	Support systems
Institutional level factors (and proficiency of implementation, time and support with resources, culture issues)	Quality assurance
Market knowledge	Marketing and business development

As discussed above, TEL should be introduced into an organisation responding to the needs of an organisation and taking into consideration the existing contextual preconditions. TEL integration into an organisation will be affected by 7 organisation activity areas (see Fig. 1) which are described in the model as 7 quality criteria groups.

An educational institution which is willing to integrate TEL should see the process of integration as embedded into the issues that the organisation can and cannot control. The first block represents the quality parameters that the organisation cannot control. It is called "Identifying preconditions" in Figure 2. However, this is exactly the first step that should be made in the process of TEL integration into an organisation. The preconditions, such as global and regional trends and dimensions in education policy, TEL demand, and information technology infrastructure in terms of internet permeability in the country, new devices and trends, should be examined and described.

As a second step, an institutional case study should be developed. Self-assessment based on the seven key quality parameters of TEL integration (namely, 1 – Strategy and management, 2 – IT (information technology) infrastructure, 3 – TEL curriculum and programmes, 4 – Continuing professional staff

development for TEL service design and provision, 5 – Support systems for TEL participants, 6 – Quality assurance of TEL services, and 7 – Marketing and business plans) should be implemented by the organisation, which would result in a case report. The case study report should describe how TEL is addressed in all seven key areas and how it meets quality criteria: how TEL is represented in the strategy of the organisation, how information technology infrastructure is developed, what experience the organisation has in TEL curriculum and program development, what policy and practice are implemented in the area of continuing professional staff development, what kind of teacher and learner support system is implemented, how quality assurance systems work for TEL and innovations in the organisation, and if new TEL services are linked with the marketing and business development (see Fig. 2).
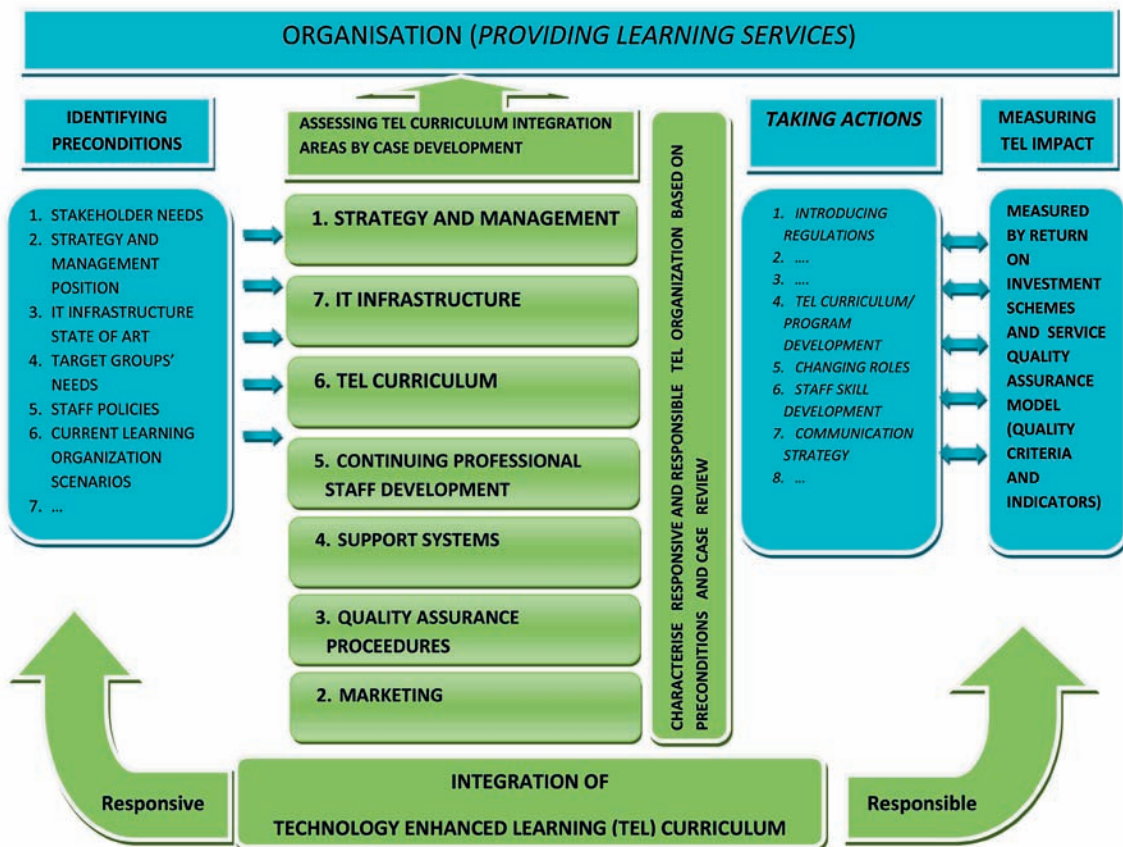

Figure 2. Framework of TEL integration into an organisation

The case study report should characterise TEL development status in an organisation, as well as include the needs described by all stakeholders of the organisation. When the needs and the demand are agreed on and described in the case study report, the process of integration becomes *responsive* to the existing preconditions, needs and demands of the organisation stakeholders and potential target groups, and is described by the case study which records all this data. As the case study is developed against TEL integration criteria groups (the seven key quality criteria groups), the case study and the process of integration becomes *responsible,* as it carries the information of the primary causes and ensures that they are taken into account and are credited for further development of the case.

Following the logic sequence of the framework, the results of the case study report are presented for the next phase of TEL integration, namely, for reviewing the case study by an expert or experts and preparing the *action plan* for TEL integration. Characteristics and pre-conditions for TEL integration into the organisation represent the data, the expert(s) implement data analysis and the action plan is the outcome of the expertise. The organisation should consider the action plan as direct recommendations for TEL integration.

The principle of responsive integration ensures reflective character of the process and decisions taken during it. It implies the need to reflect upon the preconditions existing and demand expressed by the stakeholders of the organisation before any decision is taken for change or integration of innovation. During step three, when the case should be reviewed and TEL integration should be characterised in a responsive manner, the consistency is ensured between the preconditions existing (within and outside the organisation, needs of the organisation, the demand, etc.) and further actions to be taken.

TEL integration process can be described as responsible, if the case study development is based on the framework of integration criteria groups and if taking actions is agreed upon and confirmed by both, external experts and stakeholders of the organisation. Otherwise, it can hardly be treated as responsive to the needs and responsible in terms of carrying responsibility or targeting at changing the primary cause/situation and seeking for agreement on the actions proposed.

The most difficult phase of the framework proposed is the phase of measuring the TEL impact upon the quality of organisation services. First, it should be decided what indicators demonstrate the TEL impact and what data should be collected at which stage of the implementation. Second, the organisation should give consent and allow measurement of change. Subjective and objective measurement should be implemented at different stages of pre and post integration of TEL.

Seven integration criteria groups have been identified during the research: 1) Strategy and management, 2) IT infrastructure, 3) TEL curriculum designing, 4) Continuing professional staff development, 5) Support systems, 6) Quality assurance procedures, and 7) Marketing and business. All these criteria groups do not carry direct subordination to each other; however, some groups are prior in the process than others. First, internal pre-condition in the organisation is to have TEL identified in the strategy and on the management level. Second, ICT infrastructure needs to be established in place, as well as support system and quality assurance regulations. Third, staff development should be in place and running, and TEL curriculum designing implemented. Even though quality assurance procedures will be running after TEL curriculum is designed, the quality criteria are needed well in advance in order to set the requirements for the curriculum designing. Marketing and business planning should be running from the very beginning of the process.

All the seven quality assurance criteria groups have direct correlation to preconditions of TEL integration, case development and action plans. All the criteria groups and their development will have direct impact upon TEL impact within the organisation and TEL success indicators.

The process of TEL interaction has the aspirations to be characterised as responsive (towards preconditions, organisation needs and demand from the market), as well as responsible (as case development is based on quality parameters and is implemented in the organisational context). Moreover, there is one more step in the process of TEL integration, namely, the phase of measuring TEL impact upon the organisation activities, success and service quality. Even though this research does not propose recommendations on how to measure the TEL impact upon an organisation, this is an important phase

of the process of TEL integration. In case the model is applied by experts, it is important to include negotiation and agreement with an organisation into which TEL is being integrated about the possibilities and measures of how to measure TEL impact in due time.

The following chapters in this study provide the results of the theoretical analysis as well as empirical quantitative research, which was implemented on the basis of the seven integration criteria groups.

1. Strategy and management

Many organisations are still in the initial stages of incorporating TEL into their repertoire of strengthening capacity and creating education services. TEL creates new variables, constrains and issues, making learning fundamentally different from face-to-face environments (Veletsianos & Kimmons, 2012). Gaining experience incorporating TEL into their practices and learning scenarios, institutions begin to find their niches in new virtual environments. Yet documentation of the issues, constrains, and challenges in implementing online courses continue to be limited in both, educational institutions and business organisations.

TEL implementation into educational institutions is in a more advanced position; however, it is still in its infancy in business organisations. Researchers are identifying success factors, frameworks, models for organisational context (Nichols, 2008) and results (Liu, Huang & Lin, 2012) which show that management support, organisational learning culture and institutional policy are crucial for implementation of TEL.

Bates (2010) argues that resistance to change and integration of a new TEL form arise from the issues related to funding, vision development and TEL organisation. Kukulska-Hulme and Jones (2012) state that restriction also origins from inability of universities to design new models of learning and emphasise resource constraints, and reduction of staff-student ratios.

It is clear that the integration of TEL needs careful and systematic planning to ensure success. Minnaar (2013) analysed how to implement TEL and pointed out that "planning starts with strategic planning, followed by the development

of [open and distance learning] policies for alignment with efforts, strategies, and processes" (p. 104). Technologies are chosen by individuals with different experience, sometimes long before the management faces solutions. This is a contrast to the effective technology integration, which, according to Iansiti (1998), should start with the decision makers' visualisation and perspective planning, including technological outlook.

The level of the application of TEL in various organisations is a result of many multidimensional external and internal factors. Researchers analyse these factors from different perspectives: environmental challenges (Bottomley, 2000; Schneckenberg, 2010; Wagner, Hassanein, Head, 2008) which include changes in society, economy and social sphere; changes which might be classified as a learner's level challenges such as intrinsic and extrinsic motivation (Ellis, Hubble, Applebee, Peat, 2006; Robles, 2013), new behaviour and cognitive models; challenges related to institutional (organisational) infrastructure, support, policy (Bottomley, Spratt, Rice, 1999; Boezerooij, 2006; Cook, Ley, Crawford, Warner, 2009; Schneckenberg, 2010), and etc. Accordingly, researchers analyse these factors from different theoretical paradigms: social cognitive theory, constructivism theory, motivation theory, contingency theory, stakeholders' theory and many others.

Boezerooij (2006) suggests that one of the theories dealing with the explanation of the relationships between organisations and their environments is the contingency theory. Contingency theorists argue that organisational choice and actions are limited by various external pressures and demands, and that organisations must be responsive in order to survive. The contingency theory, according to Donaldson (1995), holds that the most effective organisational structural design is where the structure fits the contingencies. Similar approaches are suggested by Bottomley (1999) and others who consider that external factors or contingencies should be taken into consideration, therefore, visions how organisation should cope and meet with these contingencies should be reflected in their strategies. As Boezerooij (2006) explains, the main basic assumption behind the contingency theory is that organisation's contexts and its environments are important for understanding actions and structures of organisations.

Environmental factors affecting the changes in education institutions are related to the development of ICT, thus, appearing stronger reliance on the use of technology in the teaching/learning. Educational institutions become open systems for diversified types of learners in terms of their age, geographical location, occupation, ethnicity, and etc. The main ideas linking the above mentioned factors are related to global processes such as globalisation of economic systems, globalisation of high skilled force, massification of education, expansion of ICT, development of the digital taylorism, which is characterised as a movement from "knowledge work" to "working knowledge" where "what is in the minds of employees is captured and codified in the form of digital software, including online manuals and computer programmes that can be controlled by companies and used by other often less skilled workers" (Brown, Lauder, and Ashton, 2011, p. 173).

A number of theories and models serve as a basis for organisations to develop their strategies responding to ICT innovations and TEL integration into their practices. One of the widely applied approaches is the stakeholder analysis. Stakeholder analysis was originally introduced by Freeman (1984) as a tool for managers to proactively engage their external environment in the face of a rapidly changing global marketplace (Moustakas & Oliveira, 2012). Other researchers (Bhuasiria, Xaymoungkhoun *et al.*, 2011) try to identify critical success factors for e-learning in developing countries. In their research they try to combine several theories such as social cognitive theory, information system success model, technology acceptance model (which is adopted from the theory of reasoned action). The latter theory (or model) is one of the widely applied theories for TEL integration within the organisation (Davis, 1989; Bhuasiria, Xaymoungkhoun *et al.*, 2011). The technology acceptance model has four main constructs such as perceived usefulness, perceived ease of use, behavioural intention to use, and actual system use.

1.1 Psychological factors for technology acceptance

The theory of reasoned actions is a model of social psychology which is concerned with the determinants of consciously intended behaviour (Davis *et al.*, 1989). This theory is formulated as generalised explanations of a broad range of individual behaviours (Kim *et al.* 2007) and suggests that a person's behaviour is determined by the individual's intention to perform the behaviour and that this intention is, in turn, a function of his/her attitude toward the behaviour and his/her subjective norm. The attitudes towards the behaviour describe positive or negative feelings toward a specific behaviour, and subjective norm assesses the social pressures on the individual to perform or not to perform the behaviour (Davis *et al.*, 1989).

The technology acceptance model provides a basis with which one traces how external variables influence belief, attitude, and intention to use. Two cognitive beliefs are posited by this model: the perceived usefulness and the perceived ease of use. The perceived usefulness is defined as the degree to which a person believes that using a particular system (for example, TEL) will enhance his or her job performance. The perceived ease of use refers to the degree to which a person believes that using a particular system will be free of effort. These two beliefs create a favourable behavioural intention towards using a particular system that consequently affects its self-reported use (Davis *et al.*, 1989). What is more, technology acceptance model postulates that behavioural intention is viewed as being jointly determined by the person's attitude towards using TEL and perceived usefulness (Davis *et al.*, 1989). According to the technology acceptance model, actual use of a technology system is influenced directly or indirectly by the user's behavioural intentions, attitude, perceived usefulness of the system, and perceived ease of the system (Davis *et al.*, 1989). The model also proposes that external factors affect intention and actual use through mediated effects on the perceived usefulness and the perceived ease of use.

According to the technology acceptance model, the intention to use is determined by the attitude toward the behaviour and perceived usefulness, along with the perceived ease of use and the influence of external variables. Figure 3 depicts the technology acceptance model (Davis, 1986).
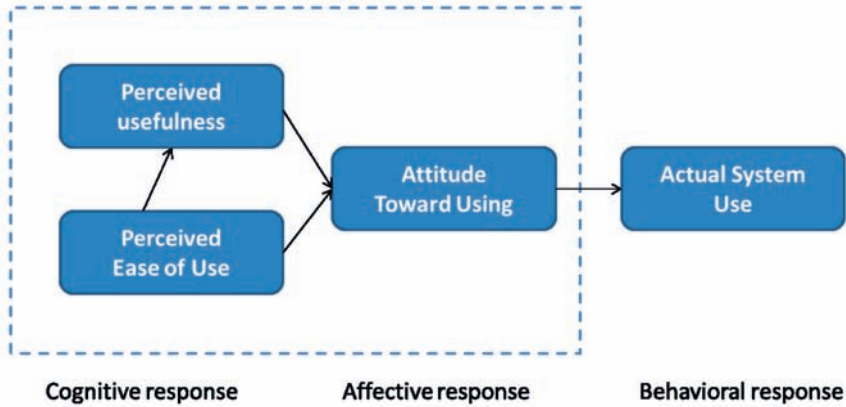
Figure 3. Technology acceptance model proposed by Davis (1986)

Davis (1989) and Davis *et al.* (1989) proposed that the first model should be extended to explain why a user accepts or rejects information technology.

The technology acceptance model can be developed to help business organisations integrate TEL. It is useful for organisation management to understand how employees will react and try to deal with novelty, such as improvement of their competencies and skills with TEL. The technology acceptance model could suggest what kind of support, motivation and promotion is needed for employees. Nevertheless, the technology acceptance model, as it is, cannot comprehensively predict all motivational systems of today's rapidly changing business organisation. That is why it is necessary to involve new variables into the model.

Expansion of technology acceptance model

There are many factors influencing TEL integration into business organisation, and these factors should be taken into account.

The technology acceptance model can explain 40% of the research sample (Legris *et al.*, 2003, Al-Gahtani *et al.*, 2007). While trying to explain people's motivation to use ICT (for example, for qualification improvement by distance learning) different researchers included other variables into the model (Legris *et al.*, 2003; Yi, Hwang, 2003; Mun *et al.*, 2006; Roca *et al.*, 2006; Porter, Donthu,

2006; Schepers, Wetzels, 2007; Al-Gahtani *et al.*, 2007; Kim *et al.*, 2007; Al-Somali *et al.*, 2009; Aggelidis, Chatzoglou, 2009; Wu *et al.*, 2010; Al-Gahtani, 2010; Djamasbi *et al.*, 2010). Variables included in the technology acceptance model can be grouped into subjective norms, organisational support, individual context and cognitive absorption. Suggestions for technology acceptance model are presented in Figure 4.
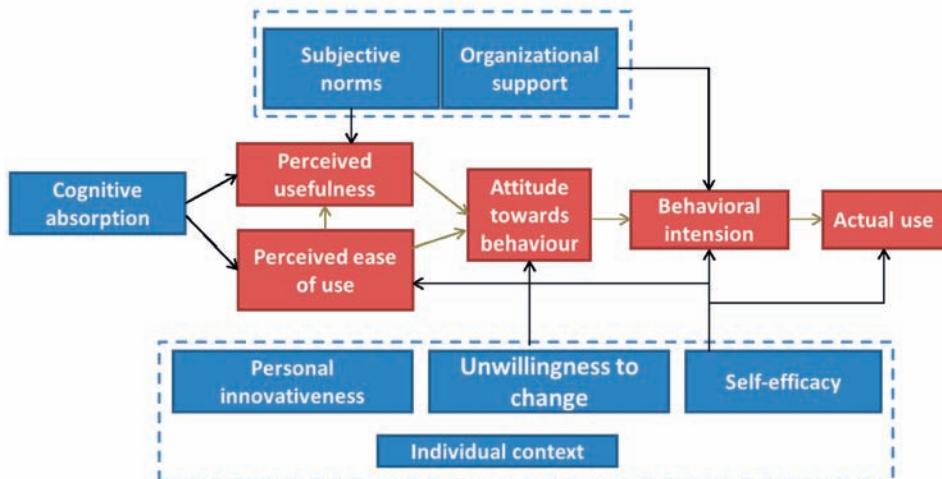
Figure 4. Technology acceptance model with additional variables

Social influence plays an important role in human behaviour and decision making. Taylor and Todd (1995) found that subjective norms are a better predictor of intention with inexperienced subjects. Davis (1989) believed that people might use technology to comply with the mandates of others rather than their own feelings and beliefs. Over all, a subjective norm (also called a social norm) is the perception of a person that other people consider important for him or her to perform the behaviour (Aggelidis, Chatzoglou, 2009; YI *et al.*, 2006). Bandura (1977) in the Social learning theory suggested that people learn and use behaviour based upon what he or she sees in social groups. Subjective norms and interpersonal communication play significant roles in adopting new decisions, in this context it would be engaging in TEL while integrating it into business organisation. There can be different kinds of social influence, for example, interpersonal influence (when employee is seeking support of family members, colleagues or friends) or external influence (influence of some

kind of information sources). Schepers and Wetzels' (2007) research results indicated a significant influence of subjective norm on perceived usefulness and behavioural intention to use. On the other hand, subjective norms do not influence actual system use (Kim *et al.*, 2007).

While integrating TEL into a business organisation, it is important for the organisation to support its employees during the changes. Lack of organisational support can be a predictor of failure to make changes in the organisation. Kim (2007) found that organisational support significantly correlated with perceived ease of use, when the employee thinks that organisation will support him/her for doing some kind of job (for example, for improving his qualification on-line) (Kim, 2007). This means that organisational support is necessary for employees' motivation to engage into TEL.

Organisational support could be defined in two ways: as documentation, management and as technological and resources support. TEL integration into educational institutions is in a more advanced position, however, for business organisations it is still in its infancy when researchers are identifying success factors, frameworks, models for organisational context (Nichols, 2008) and results show (Liu, Huang, Lin, 2012) that management support, organisational learning culture and institutional policy are crucial for the implementation of TEL. It is clear that the integration of TEL needs careful and systematic planning to ensure success. Minnaar (2013) analysed how to implement open distance learning at an existing university and pointed out that "planning starts with strategic planning, followed by the development of open distance learning policies for alignment with efforts, strategies, and processes" (p. 104). The wider possible range of modern technologies is offered for employees to use in the learning process, the more effective learning outcomes will be achieved. 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) summarise that 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). Specht and 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. These tools support: mobile content and LMS (Learning Management System) 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).

Self-efficacy is one of the predictors of motivation to get engaged in TEL. The Social cognitive theory (Bandura, 1977) states that people are neither driven by inner forces, nor simply by external stimuli. Bandura (1977) explained human behaviour via a model of triadic reciprocity in which behaviour, cognitive and personal factors, and environmental events all operate interactively as determinants of each other, where self-efficacy is a key regulatory mechanism for dynamic relationships. Self-efficacy can be defined as one's judgments and beliefs of his/her confidence and capability to perform a specific behaviour. Belief in own forces determines how people feel, think, motivate themselves and behave. Shen, Cho, Tsai & Marra (2013) argue that self-efficacy is affected by prior experience, by student participation in learning activities, by social interaction of students, by students' ability to handle tools and content management systems, and by gender differences. Analyzing self-efficacy in the context of motivation to use technology or engage into TEL, it can be separated into computer self-efficacy and internet self-efficacy. A higher level of individual's computer self-efficacy will positively associate with a higher level of performance expectations for blended e-learning system use (Wu *et al.*, 2010). Rocaa et al. (2006) argue that computer self-efficacy and internet self-efficacy have a positive effect on the perceived ease of use of the e-learning system. Aggelidis and Chatzoglou (2009) confirm that computer self-efficacy has a positive direct effect on ease of use. Kim *et al.* (2007) added that internet self-efficacy has a positive effect not only on perceived ease of use, but directly influence perceived usefulness, subjective norm, and actual usage of the internet and cognitive absorption. Aggelidis and Chatzoglou (2009) research showed that computer self-efficacy positively affects the intensity of behavioural intention too. Al-Somali *et al.* (2009) findings of the study suggest that the quality of the internet connection, awareness of online banking and

its benefits, social influence and computer self-efficacy have significant effects on the perceived usefulness and perceived ease of use of online banking acceptance. All these researches show that self-efficacy is associated with the perceived usefulness, perceived ease of use and even can positively affect the intensity of behavioural intention to involve in TEL.

Personal innovativeness or unwillingness to change is also one of the factors predicting motivation to involve in TEL in business organisation. Sometimes our ambitions can help to achieve something (for example, to improve our qualification), and resistance or even fear to try something new can prevent our development. Innovators find it easier to imagine, understand and appreciate the benefits of some kind of innovation; they are more willing to try something new. As a result, more innovative employees will be more willing to engage into newly integrated system of TEL for qualification and skill development. Yi *et al.* (2006) research confirmed a significant role of personal innovativeness in the domain of ICT in determining the antecedents of physician's intention to use a technology. It had a significant effect on the perceived ease of use, result demonstrability, subjective norm, and perceived behavioural control. Al-Somali *et al.* (2009) came to the conclusion that resistance to change has a significant impact on customer's attitude towards using online banking.

For the motivation to involve into TEL it is important if a person is enjoying learning and if he or she feels a deep engagement into learning. The trait of absorption defines individual's state of deep attention – the state whereby people are so involved into activity that nothing else matters, while the concept of engagement refers to playfulness and intrinsic interest (Saade, Bahli, 2005). Prior research studied the impact of cognitive absorption on the perceived usefulness and perceived ease of use. Agarwal and Karahanna (2000) found that cognitive absorption had a significant effect on the perceived usefulness and perceived ease of use. Saade and Bahli (2005) applied the technology acceptance model, including cognitive absorption, to explain the acceptance of internet-based learning systems. The results suggested that cognitive absorption was a stronger predictor of the perceived usefulness than of perceived ease of use. Rocaa *et al.* (2006) found that cognitive absorption while using the e-learning system has a positive effect on the perceived usefulness and perceived ease of

use. In a study of determinants of on-line shopping, Shang *et al.* (2005) also found a positive relationship between these constructs. These findings indicate that users' perception of the complexity and the usefulness of the e-learning system are influenced by the degree to which they feel involved and have a sense of enjoyment.

To summarise, technology acceptance can be expanded by various variables. The analysed scientific research suggest that variables of social influence (subjective norms and organisational support), individual context variables (personal innovativeness, unwillingness to change and self-efficacy) and cognitive absorption should be involved in the model of technology acceptance for better understanding of how to promote successful integration of TEL into business organisation.

1.2 Organisational strategies for integration of technology enhanced learning

Attempts to find strategic approaches for technology-driven educational innovation within educational establishments have been widely discussed in the recent years (Bottomley, Spratt, Rice, 1999; Boezerooij, 2006; Schneckenberg, 2010). Nonetheless, all authors finally argue for one common objective – to develop strategies or the so-called eStrategies (Schneckenberg, 2010) as institutional innovation frameworks which guide universities and other institutions to undertake measures to sustainably integrate ICT into their work processes. Bottomley, Spratt & Rice (1999) argue that universities should develop flexible learning framework supporting the variety of teaching models required to meet the needs of a diverse student body and curriculum; accommodating change and the need to continually improve; providing academic staff with on-line tools and systems to support the administration of teaching and learning.

Researchers suggest various strategies and steps towards a more systematic implementation and integration of technology enhanced learning. Collis & Moonen (2001) think that the following steps should be taken:

• Pre-initiation and initiation, in which activities are predominantly bottom-up experiences;

• Implementation, in which a more strategic approach is developed;

• Institutionalisation, in which the change becomes institutionalised and becomes an integral part of the core processes in higher education institutions.

Collis & Moonen (2001) introduced the 4-E model, which explains factors influencing individual's use of technology. These factors are classified into the following groups or clusters: Environment (Institution), Education effectiveness (gain from technology use), Ease of Use, Engagement (personal engagement about technology use for learning purposes).

In the initiation phase, Collis & Moonen (2001) particularly stress environmental subfactors, which mostly deal with the institutional component: vision of the institution about technology, actual level of the use of technology, readiness to change, funding and incentives available, experience in the past with technology, adequacy of technical infrastructure. Education effectiveness is understood as learning effectiveness and a long-pay-off. A subfactor of Learning effectiveness, according to Collis & Moonen (2001), relates to TEL as an innovation, which should solve personally related learning problems, provide new forms of learning experiences as well as provide support for the existing curriculum. A long-term pay-off subfactor makes the institution consider if the innovation is likely to create a long-term pay-off for the institution and individual.

Some researchers stress that institutions should be careful about considering the pay-off of TEL. There is a risk to evaluate only ROI (return on investment) subfactor, which is not applicable when speaking about the institutional strategies. A tendency of organisations to focus on ROI may encourage cheaper program development at the expense of effectiveness (Weller, 2004; Wagner, Hassanein & Head, 2008). In the opinion of these researchers a learning effectiveness factor should be considered in terms of learning outcomes (Romiszowski, 2004). An e-learning exercise can only be considered effective if learning took place (Wagner, Hassanein & Head, 2008).

Table 7. Factors influencing an individual's use of a technology innovation in learning-related practice (according to Collis & Moonen (2001)

Cluster	Key Subfactors and Indicators
Environment: the institution's profile with respect to technology	*Organisational – context subfactor* The vision, support and actual level of use within the institution for technology use for learning-related purposes. The readiness to change among the people in the institution when it comes to the use of technology in education.
Education effectiveness: gain from the technology use	*Long-term pay-off subfactor* Likelihood of long-term tangible benefit for the institution or individual.
	Short-term pay-off subfactor Pay-off such as efficiency gains, doing routine tasks associated with learning more quickly.
	Learning effectiveness subfactor New forms of valuable learning experiences, improved communication, improved capacity to individualise aspects of the learning experience, valuable support to the existing curriculum.
Ease of use: ease or difficulty in making use of technology	*Hardware/network subfactor* Network is convenient to access, adequate in terms of speed and bandwidth, and reliable. Computer and printer access are convenient.
	Software subfactor Software associated with the technology is user-friendly, does what the user wishes and is easy to learn.
Engagement: personal engagement about technology use for learning-related purposes	*Self-confidence subfactor* Personal orientation towards trying out new ways to carry out learning-related tasks, being interested in new technological developments and sharing these interests with others.
	Pleasure with the WWW subfactor Particular interest in new technologies, currently the WWW.

In the implementation phase, the subfactors such as *ease of use* and *engagement* are important. The ease of use factor makes the institutions move to such issues as modern technology (computers, networks available in the institution), arranged network connections which allow learning process notwithstanding the location of instructors and students, choosing software which does not require additional training, and is familiar to the institutional community. The engagement subfactor, as Collis & Moonen (2001) explain it, speaks about two main issues that have to be considered: technology used fits with the instructor's experience and beliefs about the learning; building the instructor's self-confidence starts with a successful experience. Although many researchers, such as Collis & Moonen (2001), speak about personal engagement (mainly students', teachers', instructors') one can also discuss engagement as an institutional (for example, faculty or organisational) factor.

Many e-learning strategy development approaches refer to Rogers' (2003) model for the diffusion and adoption of innovations (Schneckenberg, 2010). Davis (1989) characterised these approaches as innovation adoption models. Typically, the innovation process starts from innovation development and is followed by dissemination, adoption, implementation, maintenance, sustainability, and institutionalisation. According to Rogers (2003), the innovation-decision process involves five steps: (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation. Oldenburg and Glanz (2008) presented key concepts and stages of innovation diffusion following Rogers (2003) and Oldenburg and Parcel (2002) models (Table 8).

Rogers (2003) described the innovation-diffusion process as "an uncertainty reduction process" (p. 232), and proposed attributes of innovations that help to decrease uncertainty about the innovation (Sahin, 2006). Attributes of innovations include five characteristics of innovations: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability. A relative advantage is when innovation is realised as "better than the idea, product, or program it supersedes. Advantages considered can be economic, social, utilitarian, and so on" (Rogers, 2003). Compatibility characteristic speaks about compatibility of innovation with users' values, expectations, norms, etc. Complexity (which is closely related to Collis & Moonen's identified sub-factor

Ease of use) means that the more easily the innovation can be used, the easier adoption is expected. Trialability is a characteristic which speaks about a possibility to experiment easily with the innovation. Observability means that if the benefits of innovation are observable, the innovation is likely to be adapted more easily.

Table 8. Key concepts and stages of diffusion (adapted from Rogers, 2003, and Oldenburg and Parcel, 2002, cited in Oldenburg, Glanz, 2008)

Concept	Definition
Diffusion	Overall spread of innovation, the process by which innovation is communicated through certain channels over time among the members of a social system.
Dissemination	Planned, systematic efforts designed to make a program or innovation more widely available. Diffusion is the direct or indirect outcome of these efforts.
Innovation	An idea, practice, or object that is perceived as new by an individual or other unit of adoption.
Communication Channels	Means by which messages are spread, including mass media, interpersonal channels, and electronic communications.
Social system	Set of interrelated units that are engaged in joint problem solving to accomplish a common goal. Social systems have structure, including norms and leadership.
Innovation development	All the decisions and activities (and their impacts) thatoccur from the early stage of an idea to its development and production.
Adoption	Uptake of the program or innovation by the target audience.
Implementation	Active, planned efforts to implement innovation within a defined setting.
Maintenance	Ongoing use of innovation over time.
Sustainability	Degree to which innovation or program of change is continued after initial resources are expended.
Institutionalisation	Incorporation of the program into the routines of an organisation or broader policy and legislation.

1.3 Strategies for technology enhanced learning integration into education institutions

A strategy model for TEL integration, proposed by Schneckenberg (2010, p. 981), is based on the assumption that "a successful implementation of technology-driven innovation in universities depends on the capabilities of the leadership management to actively involve faculty in organisational change". He speaks about the need for the institutions to develop the so-called eCompetence model, which is understood as a complex unit of personal and institutional dimension (covering micro, meso and macro levels). eCompetence model is composed of competence, academic staff, competence development measures, eStrategy in universities and pervasive potential of ICT in educational contexts. As a tool to develop eCompetence of the faculty and the institutions, Schneckenberg (2010) suggests a portfolio which is based on the constructivist learning paradigm, thus, stimulates more efficient learning practices within the organisation. The appropriate measures to be taken by organisations in order to develop eCompetence were described by Kerres *et al.* (2005, cited in Schneckenberg, 2010), who defined two types of measures: direct and indirect. There are four direct measures: (1) to provide information, (2) to foster positive attitudes, (3) to organise educational supplies, and (4) to offer consulting support. The four indirect measures are as follows: (5) to increase action readiness, (6) to establish learner-active quality development, (7) to foster dialogue and collaboration, and (8) to make innovation mandatory. In the opinion of Schneckenberg (2010), Kerres *et al.* (cited in Schneckenberg, 2010), eCompetence approach is a relevant measure for internal strategy development, taking into consideration peculiarities of faculties as internal and rather autonomous structures within universities.

Development of eStrategies based on university development scenario approach is exhaustively discussed and analysed by Boezerooij (2006). He refers to the contingency model, which allows looking for relations between external and internal contingencies as independent variables with the institutional scenarios (strategies) as a dependent variable. Following scenarios described by Collis and Gommer (2001) and Boezerooij (2006) name four

strategic scenarios for universities: 1) back-to-basics; 2) stretching-the-mould; 3) global campus; 4) new economy.

The Back-to-basics scenario (strategy) is focused on further development of traditional university education, mostly targeted to face-to-face contacts and direct interaction with instructors. Most of the learning is organised and takes place in campus: libraries, auditoriums, laboratories, etc., though eventually virtual learning may occur.

In the scenario of Stretching-the-mould, a student has no particular interest in being involved in a program or course offered at a distance but would appreciate more flexibility in his local study setting. Students are interested to undertake courses from other universities. The institution responds to the learner by increasing flexibility in a number of ways, including multiple technological, instructional and other related support. The institutions may cooperate with foreign partner institutions in order to widen the choice for international on-line options within a common course management, and credit transfer and recognition system.

The scenario called Global Campus speaks about a strategy where a more flexible learning takes place. Even though a well-planned learning programme exists, students prefer to stay in their own locations. Students are provided with possibilities to participate in an on-line program. For this reason technology is very important and is used for multiple purposes (registration to on-line programmes, access to course materials, communication with colleagues and teachers, etc.).

The New Economy scenario is based on the principle of independent, personalised and self-managed learning. In this scenario students are participating in university provided study programmes all over the world, they may often be already working professionals who are encouraged by their employer for life-long learning activities. Technology enhanced learning becomes extremely important as it provides many possibilities for the student (variety of learning options, interactive communication, etc.), teachers and the institution. In principle, as Boezerooij (2006) puts, the student does not study for a degree, but he or she will require certification of acquired competencies and/or credit accumulation for professional recognition purposes.

The external contingencies analysed and identified as independent variables were named by Boezerooij (2006) and classified into four large groups (Table 9).

Table 9. External contingencies (according to Boezerooij, 2006)

Contingency	Characteristics	Variables
Technological factors	Connectivity of a country Access to internet	Number of internet hosts per capita Number of PCs per capita Number of internet users
Demographic factors	Students markets	Participation rate of higher education % of international students % of life-ling learning students
Governmental factors	National steering model Influence of governmental actors	Types of steering models Actors involved
Economic factors	Public spending Competition/collaboration	% GDP spent on education % Education budget spent on higher education Actors involved

The internal contingencies group was composed of such elements as institutional governance, institutional profile and institutional technology (Table 10).

Having analysed the interrelation between the external and internal contingencies in 174 higher education institutions distributed over seven countries, Boezerooij (2006) found that the Back-to-the Basis and The Global Campus are dominant strategies in universities. Statistically significant relations between external and internal contingencies were identified. For example, such a factor as the "use of ICT for income generation" is the case for institutions oriented towards the world campus strategy with more advanced use of technologies. The strategy named as Stretching-the-mould was not among the dominant strategies of the universities. Boezerooij (2006) explains that the latter strategy usually characterises the transitional phase of the universities from Back-to-the Basis to The Global Campus.

Table 10. Internal contingencies (according to Boezerooij, 2006)

Contingency	Characteristics	Variables
Institutional governance	Leadership	Actors responsible for setting strategic directions
		Types of decision-making
	Management	Actors with formal responsibility for ICT-related policy
		Actors involved in committees
		Actors involved in group communication
		Actors involved in implementation
	Administration	Policy instruments
		Problems with implementation
Institutional profile	Type of institution	Type of institution
	Sise	Number of students
	Location	Location of the institution
	Type pf program	Degrees offered
	Mission	Aspects in mission
	Type of delivery	Aspects offering good education
		Student demands for flexibility
	Institutional policy	Objective of ICT policy
		ICT budget
		ICT use for strategy
		ICT and personnel policy
	History	Year of foundation
	Students characteristics	Type of students
	Future mission	Aspects of the mission that involve future use of ICT
		Future students demands for flexibility
	Future type of delivery	Objective of future institutional ICT policy
	Future institutional policy	Future type of students
	Future students characteristics	
Institutional technology	Infrastructure	Level of infrastructure
	Types of technology	Types of technology
		Important mission aspects that involve the use of technology
	Teaching practices	Common teaching practices
		Extent ICT is being used for teaching practices
		Impact of ICT

10 years later Collis & Moonen (2011) argued about the progress towards flexible learning implementation in the education system. They discussed the findings of the research carried out in the UK universities in 2010, which revealed that "It is not uncommon for institutions to make a commitment to new technologies in their strategy documents but in reality they are watching the field and hope they are ready to 'switch on' quickly if and when necessary. In a very person-to-person oriented learning system (e.g., Oxford/ Cambridge) technology has a limited impact on teaching and learning, but it does make resources available" (Collis & Moonen, 2011, p. 17). One of the major obstacles for technology enhanced learning integration is a long-lasting research tradition and culture of universities, as identified by Schneckenberg (2010), who says that traditionally the priority in higher education is given to research but not to teaching activities. For this reason tertiary education is still focused on scholarly products but not on teaching innovations.

1.4 Strategies for business

Similar approaches may be taken by private companies while developing their eStrategies; however, some peculiarities of the sector must be taken into consideration. Hamburg & Hall (2013) note that previous studies (such as the projects Ariel and SIMPEL), examined barriers which make SMEs (Small and Medium-sized enterprises) fail to apply e-learning or utilise the web for effective CVET (Continuing Vocational Education and Training). The main are the following:

1. A reactive approach to learning;

2. A lack of electronic content which can be found easily;

3. A lack of time to explore relevant training options to achieve the competitive strategy;

4. A lack of relevant ICT applications;

5. A lack of staff motivation;

6. A lack of understanding of all the advantages of e-learning particularly by managers and persons responsible for further education in companies.

Doris Beer *et al*, (2008); Hamburg & Hall (2013) suggest that a successful implementation of technology enhanced learning in SMEs depends on the implementation of the following aspects:

- Identification of needs and objectives of training.
- Engaging employees: The literature suggests that there are many barriers to employees undertaking e-learning, i.e. e-learning is not very closely linked to day-to-day tasks.
- Time factors and form of training used: SMEs staffs are often burdened by the daily business pressure and devote little time to learning activities. So they prefer informal forms of learning to take place, often on the job, through sharing experience with colleagues about the job tasks.
- Courses/Learning Content: The most important topic for training courses in SMEs being the "core business" of the company refers to the competencies the staff need for their work tasks. Other themes should be norms and procedures helping SMEs to survive/integrate into the market. Besides, management skills, accounting and language skills are also important to be learned.
- Tutor support for e-learning and integration of it with more traditional forms of learning: The evidence suggests that the learning experience within traditional forms is helpful for users and that the completion rates are greater as there is tutor support in the way of face to face, on-line or over the telephone.
- Learning infrastructures: space, time, clime, etc. to support e-learning.
- Organisational perspective, transfer of knowledge: Communities of practice, teaching groups, partnerships supported by learning platforms and special connections have to be developed in order to strengthen dialogical transfer.
- Economic aspects: a business part of the model should represent economic aspects of the e-learning strategy (costs, needed human resources, etc.).
- Quality and (self) evaluation criteria: Quality criteria have to be established. Evaluation tools for efficiency and results of the training efforts should be developed that can be easily handled because SMEs lack staff and know-how and do rarely some evaluation.

According to these authors, a more applicable approach for eStrategy development would be based on Roger's (2003) innovation diffusion model. However, other models for a more effective integration of the technology enhanced learning could be explored. These models or approaches are not necessarily linked to the development of specific eStrategies but on a deeper understanding of e-learning processes. For example, Chang & Guetl (2007) speak about the development of e-learning ecosystem. Following the idea of ecosystem, they

elaborated the concept named "learning ecosystem", (later the concept narrowed to e-learning ecosystem), which consists of the three basic components: 1) specifics of the learning communities and other stakeholders in e-learning ecosystem, 2) restricted learning ecosystem conditions of e-learning ecosystem; 3) specifics of the learning utilities in e-learning eco-system. This allows to assessing and or developing the learning strategies in SMEs taking the holistic approach.

Stakeholders in all the discussed models and strategies play a very important role. Stakeholders' analysis is still one of the widely used tools to learn and define external and internal needs, changes and challenges for technology enhanced learning within an organisation.

1.5 Stakeholders analysis

The concept of stakeholders appeared in the system theory literature starting from 1963 (Elias & Cavana, 2000); however, mainly after Freeman's book "Strategic Management: A Stakeholder Approach" (1984), the concept of stakeholders became embedded first in management sphere and later expanded to other spheres, including education. According to Wagner, Hassanein & Head (2008), stakeholders' involvement in education is based on the constructivism paradigm which stresses the importance of learning personalisation according to individual's special needs. While implementing technology enhanced learning within organisations, it is vital to ensure that this process should be organised following a bottom-up principle; however, the interests and needs of the main stakeholders identified by the organisation should be taken into consideration. As Wagner, Hassanein & Head (2008) put, the stakeholders of e-learning are those that are affected by it. Moustakas & Oliveira (2012) specify that the stakeholders' concept refers to individuals, groups or organisations that need to be taken into account by leaders and managers contemplating any action on an issue. Wagner, Hassanein & Head (2008) identify the main groups of stakeholders for the e-learning implementation and characterise them in terms of their motivation and concerns for e-learning. According to Wagner, Hassanein & Head (2008), stakeholders should undertake certain roles or responsibilities for effective e-learning within the organisation. In other words, stakeholders' interests are important not only for the development of eStrategies but are directly or indirectly "employed" in their implementation. This approach may be explained

by a rather extended practice within the educational sector today to apply the basic principles of the New Public Management, which involves stakeholders in the governance and activities of educational establishments.

Stakeholders' analysis may be done following different models and scenarios. For example, Freeman (1984) uses a generic stakeholder map as a starting point. As Elias & Cavana (2000) discuss the stakeholders' analysis steps for system thinking and modelling, a stakeholder map could be developed around one major strategic issue. Following Freeman (1984), a two dimensional grid is further developed in order to identify stakeholders' interests (or stake in case of private sector organisations) and characterise them in terms of power. Moustakas & Oliveira (2012) extended stakeholder analysis to the context of mobile learning. They identified five primary groups of stakeholders and grouped them into internal (learners, academics, administrators) and external (government, enterprises and communities) stakeholders. Through the stakeholders' analysis they tried first to realise their involvement within the organisation (institution) and objectives while using the 3G mobile application.

Depending on the issue the organisation has to deal with, the importance of various stakeholders may differ. Susnienė & Vanagas (2007) suggest that stakeholders' analysis could be done following four steps:

1. Identification of stakeholders;
2. Prioritisation of stakeholders;
3. Understanding stakeholder needs and interest;
4. Integrating stakeholder needs into organisation's performance plans.

Similar ideas can be found in the works of Bates (2000). As many other researchers, he also speaks of the clear vision and mission of the institutions towards technology enhanced learning integration. He suggests identifying new target groups that could be reached through the use of technology, prioritizing these groups and defining what programmes might be offered to these groups.

Wagner, Hassanein & Head (2008) consider that effective e-learning depends a lot on the collaboration of various stakeholders. They identified the main groups of stakeholders for e-learning in educational institutions: students, instructors, educational institutions, content providers, technology providers, accreditation bodies and employers. The summarised motives and concerns of the above listed stakeholders are presented in Table 11.

Table 11. Motives and concerns for e-learning within educational institutions (according to Wagner, Hassanein & Head, 2008)

Stakeholders	Motives	Concerns
Students	A better access to higher education	New skills required More motivation Higher incidence of withdrawal or incomplete grades
Instructors	Encouraged or pressured by the institution Reaching a broader audience Interested in TEL learning benefits	New skills required Changed role from source of knowledge to knowledge manager Acceptance of e-tools by students Increased time consumption
Educational institutions	Facilitation of lecture delivery and creation of new technology mediated learning opportunities for students	Budgetary restrictions Costly technology upgrades Measuring effectiveness of e-learning Resistance from faculties Acceptance of online learning by employers
Content providers	Provide content modules that will result in effective learning. Commercial content providers are motivated by profit to develop content modules that are flexible across institutions with minimal adaptation efforts	Intellectual capital rights Selling (providing) products to multiple customers
Technology providers	Provide learning environments for effective learning	Technology standards Provisions for personalised learning Regular investments on innovations
Accreditation bodies	Encompassing e-learning in accreditation standards	Increasing number of institutions offering e-learning Proper quality standards and accreditation process
Employers	E-learning as an alternative learning path	Decreased interpersonal interaction

Wagner, Hassanein & Head (2008) developed a stakeholders' matrix (Table 12) which explains the roles and responsibilities of the stakeholders identified. The matrix is read from right to left which allows developing understanding how various stakeholders may interact.

Table 12. E-learning Stakeholders' Responsibility Matrix (according to Wagner, N., Hassanein, K., & Head, M. (2008).

	Student	Instructor	Institution
Student	participate in collaborative exercises share experiences and encourage use	participate proactively in exercises provide feedback regarding overall effectiveness	use e-learning technologies according to institutional policies
Instructor	provide effectively designed courses incorporating e-learning content provide technical and motivational support to encourage use	share experiences and encourage use promote standardisation	use e-learning technologies according to institutional policies
Institution	standardise the e-learning experience across courses provide technical support protect sensitive students information	promote training in instructional design and technology provide technical support provide incentives enforce standardisation	recognise e-learning credits share e-learning experiences and courses encourage standardisation
Content Provider	select appropriate content and media for e-learning comply with usability standards	provide content that meets course & programme needs comply with learning & usability standards	provide content that meets institutional needs comply with learning standards
Technology Provider	consider learning principles when designing allow adjustments for individual learning styles comply with usability standards	consider usability and teaching principles when designing comply with learning & usability standards	comply with standards for interoperability provide technical support and training
Accreditation Body	enforce standards to ensure quality of accredited courses	provide clear guidelines for requirements	provide clear guidelines and timely services
Employer	recognise the validity of e-learning	provide feedback regarding success of graduates	provide feedback regarding success of graduates

The matrix proposed above outlines the actions that each stakeholder group should take in order to address the motivations/needs and concerns of the other groups. The matrix may be used by various institutions while initiating new technology enhanced ideas. As the authors of the developed matrix argue, the future steps in the development of this matrix are related to the validation of this framework across various institution types, educational programmes, and cultural settings.

Content Provider	Technology Provider	Accreditation Body	Employer
provide feedback regarding the appropriateness of content for e-learning	provide feedback regarding the effectiveness of technologies	demand accreditation for e-learning programmes provide feedback	promote the validity of e-learning during interviews
ensure protection of copyright provide feedback regarding the level of effectiveness experienced by students collectively	provide feedback regarding the effectiveness of technologies	adhere to accreditation standards	educate on the validity of e-learning
ensure protection of copyright provide funding for content development	provide feedback to improve future versions supply appropriate infrastructure to support technology	adhere to accreditation standards provide evidence for quality assurance	seek course accreditation to provide evidence for quality assurance educate on the validity of e-learning
comply with standards for interoperability	comply with standards for interoperability	adhere to accreditation standards	provide content relevant to work environment
comply with standards for interoperability provide technical support	comply with existing standards, and collaborate to develop new standards when necessary	adhere to accreditation standards	provide an effective learning environment to maximise learning of potential employees
provide clear guidelines for requirements	provide clear guidelines for requirements	collaborate to ensure consistency	enforce effective standards to ensure quality of graduates
provide feedback regarding relevance in workplace	provide feedback regarding success of graduates	ensure that standards provide appropriate measures	share experience and encourage acceptance of e-learning

The support from the management, strategic planning and TEL service policies in an organisation are crucial factors for TEL service development. Resistance to new forms and services may result in the issues related with the lack of resources and reduction of staff, whereas failing to respond to stakeholder interests may also decrease the effectiveness of TEL in the organisation.

To summarise and to conclude, this chapter focused on the analysis of scientific literature discussing how institutions are ready for TEL integration in terms of strategy measures and management, and administration preparedness for this. Scientific research proves that management support and institutional policy are crucial for TEL implementation; however, resistance to change and funding, as well as resistance to new models of learning and teaching culture still prevail.

The results show that institutions begin with the development of technological infrastructure mostly establishing new virtual learning environments, and indicate these as measures in their strategy. However, research proves the need to start with decision maker's visualisation and perspective planning. Perspective planning should correctly estimate external and internal factors such as environmental, economic, social, learning paradigms, psychological, institutional changes, return on investment, development in education policy, policy support, technology development, and others.

The strategic models on TEL strategy development have been reviewed in this chapter, as well as the process of innovation development. As a conclusion, it can be stated that the decision of TEL integration should start with the management vision, assessment of external and internal factors, and evaluation of TEL integration areas affecting organisation activities. Support and funding should be planned for TEL integration, impact indicators should be agreed upon, and all the areas of organisation activities, like curriculum designing, information technology infrastructure, staff professional development, support system, quality assurance, as well as internal and external communication, should be taken into consideration.

2. Information and communication technologies and infrastructure

Educational system is considered to be influenced by three main driving factors: (1) educational practice, (2) educational research and (3) educational technology (Westera, 2010). These three factors are interrelated and influence each other. New educational technology requires new educational practice which in turn triggers educational research to test or prove its efficiency or possibilities. The sequence of these three factors may also vary: new educational research may lead to new educational practice that will in turn require for new educational technologies and also the other way round.

According to Westera (2010), *educational practice* today is still mostly derived from the 19th century, meant to prepare workers for factory work, and students are still treated as ignorant learners to be converted into skilled workers. However, the target to equip students with skills, knowledge and competencies for the modern knowledge society has failed. Innovations are often added to the existing curriculum but not instead, thus increasing the workloads. *Educational research,* according to Westera (2006), still has on the most part supported the idea that pedagogy is the main driving force for the education innovations and not the new technologies. While the new technologies are met even more sceptically as not fitting into existing pedagogic models, the reality is directing to the opposite as the existing technological achievements have been attained due to close cooperation of science and practice. Today's learners are immersed into using digital technologies in their daily lives and expect to use *education technologies* as tools in their learning process. No technology is a remedy as such but it may be efficiently employed in order to achieve higher learning results or reach otherwise unreachable persons, however, only when it is adequately used and integrated into the learning process. Furthermore, didactic solutions for successful technology enhanced learning require not less input, effort and investment than technology itself.

New technologies have altered the way learners interact with instructor and classmates, and internet self-efficacy is a significant predictor for learners' satisfaction in fully online learning settings (Kaminski, Switzer, Gloeckner,

2009; Kuo, Walker, Beland & Schroder, 2013). Usefulness and easy to use are compulsory for TEL services (Sela & Sivan, 2009), and system quality is positively related to service quality (Kettinger, Park, & Smith, 2008). Easy-to-use systems give users a greater perception of usefulness and promote a positive attitude towards the system, which implies that a system with better quality (such as better response time, reliability and accuracy) can deliver better services.

Learning management systems are the critical element of an institutional online learning infrastructure. Salinas claims that it is perhaps the most widely used and most expensive educational technology (Salinas, 2008). An e-learning environment is more than just the sum of a technical system and quality learning 'content'; its success, or otherwise, is strongly mediated by actions taken in the management of the system (Hilgarth, 2011). Palmer *et al.* (2013) suggest "distributed models of leadership" for virtual learning environments that would be "proposed as appropriate for the good governance of both large IT systems and higher education" (p. 73). The authors ensure this is an important insight into the quality management of virtual learning environments.

Blumenfeld *et al.* (1991, cited by Edelson, Gordin & Pea, 1999) identified six contributions that technology can make to the learning process: 1) enhancing interest and motivation; 2) providing access to information; 3) allowing active, manipulative representations; 4) structuring the process with tactical and strategic support; 5) diagnosing and correcting errors; 6) managing complexity and aiding production.

2.1. Enhancing technologies

The changing landscape of education demonstrates that technology plays an important role in the world today. Although the development of technology and software is progressing in the direction of intuitive user-friendly design, technology as a medium is not something natural and requires efforts to learn how to use it. Although people feel uncomfortable with it, at least some types of technology have been used increasingly in any education setting ranging from traditional learning to distance learning. The technology might be synchronous, such as video-conferences that are enabled by such software as

Skype, Moodle or VoiceCafe. Such software allows for an on-time interaction and immediate feedback between teachers and learners or learners and their peers. It is a way to replace the face-to-face interaction for those who choose distance or blended learning due to time limitations, working patterns, or higher costs of traditional learning. Asynchronous technology, such as E-mail and online discussion via Yahoo or Google groups allow for a delayed communication. However, even if asynchronous technology is widely used, learners are not necessarily satisfied with it due to delays in teachers' or peer's responses (Bentley, Shegunshi, Scannell, 2009).

Olapiriyakul and Scher (2006) summarise three types of technology that are required for an effective hybrid-learning course that would also be required for online courses. There is a need to have an adequate technology infrastructure, consisting of network facilities, database resources to enhance connectivity and links of various learning and pedagogical technologies together, effective instruction technology to support teachers, and technology to support learners, providing opportunities for learners to learn and interact with teachers and peers.

In their study, Chen, Lambert and Guidry (2010) showed that technology does have an impact on student's engagement, especially in the earlier years at college. Their results indicate that use of the technology positively affects both student engagement with the course and learning outcomes as well. Similarly, teachers may sometimes prefer teaching an on-line course (Díaz, Entonado, 2009) to traditional face-to-face course due to less cognitive resources needed to make their point.

Web 1.0, 2.0, 3.0.

Internet technologies are widely used in education. From early days of internet development, teachers used World Wide Web (www or Web 1.0) for creating educational content and spreading different kinds of text and graphics materials. When using internet technologies, teachers were faced with the need to learn internet programming or had to ask technicians to help them. At least three persons needed to work in a team – teacher, who knew the content of materials needed to be uploaded to the net; technician

(programmer), who knew HTML (Hypertext Markup Language) skills and programming languages (java, css, internet databases) and internet designer. Besides that a big computer, called workstation, was needed to store all the material. In Web 1.0 times web was used as a platform. It is still possible to find examples of such a type of internet technology. A big and well known example is Encyclopedia Britannica http://www.britannica.com/.

Since the first years of the twenty first century, the new web technology, called Web 2.0, has been implemented. Teacher could use this technology (called read-write web) alone, without technician's assistance. It is now possible to use various design templates for publishing the content online free of charge (because of that no designer assistance is needed) and teacher may upload materials online with no specific programmer skills needed. In order to use Web 2.0, it is necessary to know your subject, be creative, have cooperation and collaboration skills, be open, and share your knowledge and skills peer to peer. Learner may control his own data and other learning materials. All main services, previously performed by computers, have been moved to the internet space. A well-known example of such a type of web is Wikipedia.

In the rapid change of internet technologies, semantic web (or Web 3.0), a common framework that allows data to be shared and reused across applications, educational settings, enterprises, and community boundaries, becomes a reality. Web 3.0 is approaching the point where the computer rather than humans is generating new information. Web 3.0 includes these components: TV-quality open video, 3D simulations, augmented reality, human-constructed semantic standards, and pervasive broadband, wireless connection, and sensors.

Blogs

Blogs are used to write and publish educational content online. The only one possibility to influence content is commenting. Blogging can archive lessons learned by providing opportunities for reflection through commenting the blog post. This kind of active engagement has the potential to promote deep learning of materials. The traditional classroom walls can be easily extended by providing opportunities to interact with other cultures and people. Research

on blogging (Eide, 2014) show that blogging promotes critical and analytical thinking, emphasises creative, intuitive and associational thinking, and combines the best of solitary reflection and social interaction.

Forums

Forums are virtual places of communication. They provide asynchronous opportunities of communication, but they have certain limitations that slow down the learning process. Because the communication is elongated in time, learners' questions are answered later. In some cases an answer is needed as soon as possible and waiting for feedback stops the learning process for a while. The greatest advantage of traditional face-to-face education is the personal interaction with learners, and the opportunity for both learners and teachers to take advantage of relative cues to make points and to verify that a point or a question has been understood. But the learners in forums do not have contextual discussion or explanation for a certain concept. Forums are still used but with rapid development of technologies they become synchronous, it is possible to receive frequent and continuous feedback from peers. Forums grow to virtual online discussions and social networks.

Wiki technologies

Using wiki technologies, it is easy for the teacher to organise virtual class management, share assignments and activities, organise collaborative social writing exercises, do formative assessment. The main wiki features are simple and very easily understandable rules: no any downloads to user's computer, and learners do not claim ownership of their ideas and texts presented, because texts could be changed and deleted by other learners and contributors. This promotes and drives collaborative online activities. Wiki may become a focal point of interest for developing communities of practice, within which teachers and learners can store their knowledge. In classroom learning, as well as in virtual settings, teachers will need to encourage learners to contribute; thereby fostering a sense of community, but it is inevitable that some students may contribute more content than others (Wheeler *et al.*, 2008).

Other

Workgroup – projects and tools for common text creation, provided by big companies such as Google or Microsoft. These tools are now available to be used not only on desktop and laptop computers, but also on tablet and mobile devices. This availability is very important for the learner, because it broadens the learning space available.

E-portfolios are a valuable learning and assessment tool. It could be used to collect learner's resources (text, multimedia, graphic, internet sources) as well as represent an individual, group or institution. The same time e-portfolio could serve as an administrative tool to organise, manage and control the learning process. E-portfolios are very useful for personal reflections, exchanging ideas and receiving feedbacks.

Infomous is a tool to customise in one virtual place the learning content that is relevant to the subject. This content can be keywords, news feeds, blog posts and comments, social steams. Learners click on keywords to reveal links to the related content. Infomous clouds could be prepared by teacher to visualise study materials. Student can prepare an individual cloud on the study topic (Fig. 5). Online registration is needed to use it as a free of charge tool.
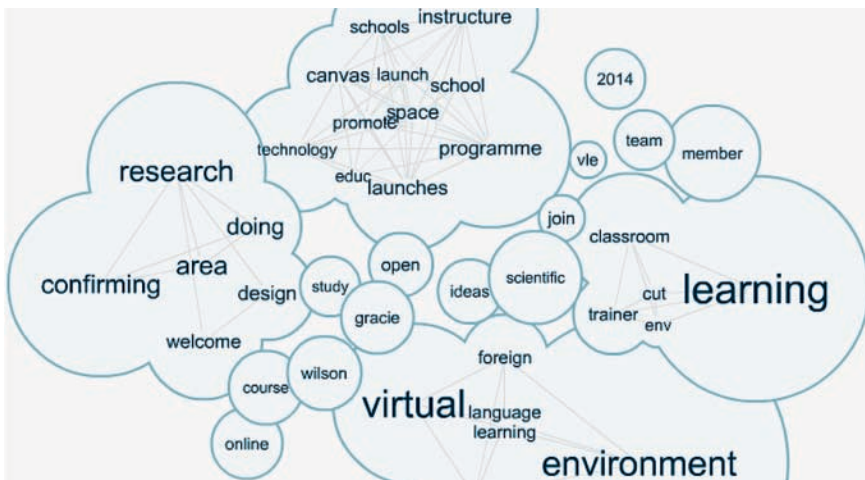

Figure 5. Word cloud from Vytautas Magnus University news, prepared using Infomous technology

Wordle is an educational online free of charge service for generating "word clouds" from text that a teacher or a learner provide. The clouds give greater prominence to words that appear more frequently in the source text. There is a possibility to tweak these clouds with different fonts, layouts, and colour schemes. The images that a user creates with Wordle could be included in different educational programmes. It is possible to print them out, or save them to the Wordle gallery to share with the members of educational community later on. It is possible to prepare a "word cloud" from a text or from any educational site that has Atom or RSS feed (Fig. 6).

Figure 6. Word cloud from Vytautas Magnus University, prepared using Wordle technology

Wordle could be used to graphically represent a lecture or a speech, a book, historical documents, blogs, wikis, twitter or conference posts. Learners can brainstorm thoughts and memories about learning materials and teaching/ learning process and generate questions for further study or research. It could be used in language learning to represent educational ideas or create reports.

Brainstorming and mind mapping techniques raise creativity, and are very useful when learners need to solve problems, visualise outline presentations and papers, taking notes and lecture memos rather than copying or rewriting everything the teacher says (Davies, 2011). Mind maps help to discover new relationships between ideas. It could be used by a group of learners in a virtual learning environment or a workplace to solve problems. These methods help learners to analyse and solve complex and strategic problems.

Technologies could be organised to six clusters depending on web-based collaboration and communication practices in education (Fig. 7).
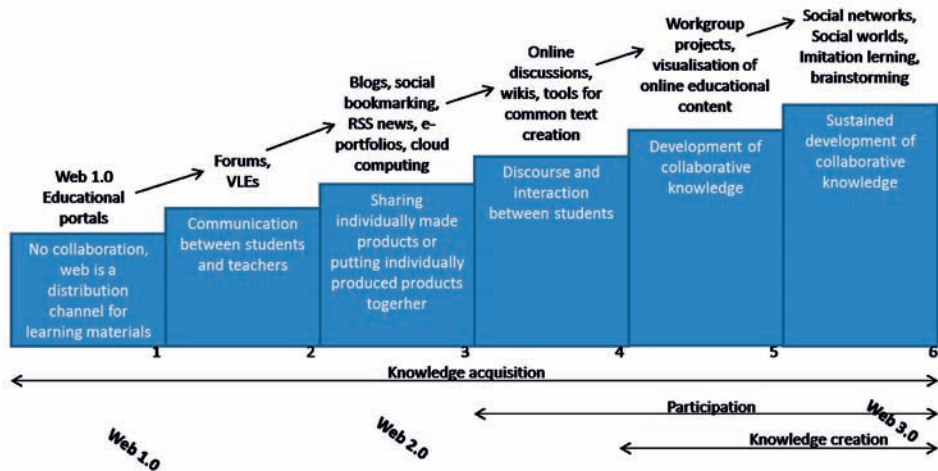

Figure 7. Web-based collaboration in education (based on Lakkala et al, 2009)

Step 1 represents Web 1.0 educational portals, where web serves just as a channel to distribute information and educational content prepared by the teacher. Learners only read the information, and no collaboration occurs. With the development of read-write web, a possibility for teacher-learner and learner-learner communication occurs (Step 2). Step 3 describes a situation when interaction (one to many or peer to peer) is possible. There could be situations when learners write and comment on blogs, prepare and share educational materials. An extensive interaction between students starts with the possibility to use virtual discussions, twitting, chatting, video communicating, discussing in groups. This includes voice presenting group and individual works, arguing,

commenting, sharing and learning not only from the teacher but also from each other. The most challenging are Steps 5–6 when learners start to create knowledge themselves. The teacher serves only as a moderator, facilitator, and mentor. The technologies that are helpful at these steps are social networks and social worlds, brainstorming, mind-mapping and imitation learning techniques, various types of visualisations and workgroup creation techniques. In Steps 5–6, the teacher needs to be very creative, because in many cases the process of teaching-learning is cyclical – the teacher mentors, however, learners could also mentor not only each other but their teacher as well.

To summarise and to conclude this chapter, information technologies are an important part of TEL integration into an organisation, strongly dependent upon educational practices and TEL service forms. Development of technological tools is an important factor for successful TEL integration. Most important enhancement brought by technology integration is interaction among learning participants, accessibility to learning content, and self-efficacy of online solutions. Learning management systems are critical elements for online learning services.

Technology enhances learning when it increases motivation, provides access to information, allows active learning and support, and facilitates management of complex resources and communication channels. Technologies become enhancing when they meet these criteria and suggest these functions for the learning services.

As a conclusion, technologies are a crucial element in TEL integration, but they should be selected on the basis of educational practices and needs of educators. Technologies should be enhancing learning through user friendly solutions, through self-efficacy characteristics, communication and management process facilitation. Technological infrastructure chosen should enable collaboration and communication practices in education and should follow research recommendations from education and information technology areas in order to be effectively chosen. Development and update of ICT tool kits and handbooks, as well as continuing staff training on the use of ICT are crucial elements in the organisation while integrating TEL. Training should be focused adequately on the potential created by the use of ICT and enhancement of the learning process rather than technical functionalities.

3. Technology enhanced learning curriculum

Learning and technology are no longer considered as didactic rivals; they are increasingly treated among educators as compatible and synergizing each other. Learning has penetrated in people's daily lives in so many multiple ways and spheres that the learning process may not be thought or planned separately from technology. Young people and other generations included may not imagine their daily routines without different bits of technology, so why should they be excluded from technology in their learning? Researchers agree that ICT as such cannot improve educational processes, but ICT may trigger and enable the use of innovative methods that make learning more efficient and attractive to learners (Van Merrienboer & Brand-Gruwel, 2005).

In knowledge economies organisations need to educate and train anyone, anytime, and from anywhere (Govindasamy, 2002). It is also about training the right people with the right skills in the right time, i.e., timely access to the necessary resources. The results from a large-scale experiment demonstrate the power of a TEL curriculum to deepen the learning of mathematics in the middle school mathematics across diverse ethnic and economic settings (Roschelle *et al.*, 2007). Designing TEL curriculum opens many attractive opportunities and liberties for teachers and course organisers, such as increasing technological opportunities to combine different environments and platforms, easily replicable content, avoidance of time and space limitations and etc. However it also (Fang, 2001) binds to certain limitations related to increasing numbers of different computing platforms that require different plug-ins and software to get the sound and view functioning. Easy replication of digital data does not always mean easy modifications, the content is still depending on the target group – so when the target group changes, the content may lose its effectiveness, therefore the development of online course is no less time consuming than the face-to-face one as well as providing feedback for online students is as demanding as face-to-face (see Table 13).

Table 13. Opportunities and dilemmas of TEL related to content development (Fang, 2001).

Opportunity	Dilemma
Technology is becoming more open and versatile to overcome barriers of different computing platforms.	• One of the top complaints for web masters is that users are not able to see and hear data that require special software or plug-ins. • Compatibility among different versions of web browsers or operating systems, performance and availability of broadband delivery, etc. are still unstable issues for developers and users.
When data are digital, contents could be replicated easily.	• Many people equate replication with maintenance. • Digital data that are built with rigid technology cannot be easily modified.
Re-purposing a digital course could offer the following flexibilities: • Course enrolment is no longer bound by the physical limitations of lecture theatres • Course could benefit more off-campus students from different geographies	When the target group of a specific course is changed and not the contents, then the learning effectiveness would be lowered. The learning objectives and outcomes would be unlikely to align with the new user needs.
Seemingly "one size fits all" course content has significant cost saving advantages for increasing enrolment base quickly.	One size does not usually fit all. • If learning outcome is the priority then the process of "resizing" contents to "fit" learning could be costly.
Lecturers who no longer have to meet their students regularly in the classroom could spend more time for their research.	Lecturers who now become content providers might find developing an online course that engages students more work requiring than developing a face-to-face classroom course. • Lecturers have to get used the different roles such as developer in a team, eTutor, e-facilitator, etc.
Monitoring on-line students does not require the same rank of teaching staff as lecturers, therefore, could be more cost effective.	Some lecturers might start to question if their on-line development efforts are actually helping the university to decrease expensive high calibre staff in the long run. • Lecturers do not realise their development efforts are on-going in order to adjust to the changing needs of students. • On-line monitoring should be on-line exchange; therefore, the quality of the feedback from the teaching staff is very important.

Curriculum can be researched as a philosophy of education, connected to organisation's mission and vision; as a content – intended learner outcomes and results reflecting the attitudes and values an organisation believes are appropriate to its personnel (members); as learning experiences (the mental operations that students employ in learning the subject matter) – the more related to real life experience, the more understandable and acquired; as continuous assessment and improvement of quality, fostering learners to develop the defined organisational and individual curricular outcomes.

Morrison & Anglin (2012) argue that curriculum authors should have attributes and affordances to create efficient and effective instructional strategies. They claim that curriculum designers should be ensured with applicable technologies for presentation of information, for interactions, and pacing of the instruction. Feedback should be ensured in any type and manner, and pacing possibilities should ensure full control over curriculum sequence and openness. The characteristics of an effective activity design were described by Macdonald & Black (2010), claiming that effective activity design makes use of interaction in an online community when participants have a sense that they belong to an active group of fellow participants.

3.1 A shift of paradigm for teachers

Schools, businesses and other types of organisations invest in technology. Many educators advocate the enhancement of learning with technology (Hoffner, 2007; o'Bannon & Puckett, 2007), while others are apprehensive about the impact of technology integration into classrooms. Research literature discuss factors that prevent using new technologies in classrooms: socio-cultural, such as economics and location, personal variables of educator such as age, gender, attitudes, beliefs or teaching philosophy, ICT skills. Teachers and their learners often hold distinct views on the integration of technologies into schools. This distinction is reflected in their beliefs about the benefits and disadvantages of technology. Some teachers argue that "technology is replacing teachers".

Learning how to use technology is a challenge for both teachers and learners, but learning TEL curriculum creates more problems than just learning a few

software programmes. For example, according to Olapiriyakul and Scher (2006), an online course requires more preparation time than a traditional course. The authors also add that more money and strong knowledge in technology is needed in order to use web-based technology. It is important for the technology enhanced teaching that instructors fully understood the process of such teaching and the structure of the changed learning environment, were aware of the way to build relationships with students and the ways of supporting them in their self-regulated learning (Olapiriyakul, Scher, 2006). Kyei-Blankson (2010) reports the results from other studies by mentioning the main challenges with TEL which are as follows: a lot of time devoted to learn how to use new and various technologies, frustration if the technology is not functioning well, also lack of support from the institution and peers.

It is often said that TEL, much more than traditional learning, can highlight negative sides of teaching (Anderson, Dron, 2012). Successful organisation of TEL process is determined by good preparation and good communicative skills. The teacher's position with regard to students is seen here more vividly than in traditional teaching. It is due to the fact that learners have more time in a virtual teaching and learning environment to reflect and think over the presented material.

Jahnke *et al.* (2012) prepared a conceptual paper to investigate the challenges that teachers and learners face in mobile learning. For example, the authors observed a shift from a textbook to learning to be creative. This creates difficulties for administrators in academic institutions as they have to make new policies, visions and strategies. Furthermore, it creates uncertainty for a teacher in how to teach students creativity, and for students how to deal with uncertainty in finding ways to become creative to solve complex world problems. The second challenge, noted by Jahnke *et al.* (2012), is that informal learning is integrated in the formal education what requires new teaching methods. The shift from reading and learning textbooks is transferred to using textbooks in order to solve problems at hand. Thirdly, traditional teaching routines are disrupted by innovative ways which put additional workload on the teaching staff and learners, as they have to learn how to exploit these innovations for the enhanced learning. Finally, technology enhanced learning

connects informal learning and collaborative work. This creates challenges to learn to cooperate and participate in the team what opposes to the traditional approach where individuality is promoted as the lecturer is speaking on his own and the students are learning on their own.

Finally, there is an issue of different understanding of challenges created by technology-enhanced learning from lecturers' perspective and stakeholders' perspective. Studies of the teachers' views of technology-enhanced learning are concerned about teachers' knowledge and capabilities of using technology (e.g., Beck, 2008), engagement (e.g., Kyei-Blankson, 2010), institutional support, changing teacher roles (e.g., Ocak, 2011), satisfaction (Wasilik, Bolliger, 2009).

Discussions in scientific literature relate to effective practices in the use of emerging technologies for online education, but there is lack of empirical evidence and guidance on how to use such tools effectively (Kim & Bonk, 2006). The survey conducted with 562 online instructors in the US in 2003 showed that the pedagogical skill (22.9% of respondents) was treated as more important than the technological skill (15.3%) in online training (Kim & Bonk, 2006). It is a task for educators to penetrate different aspects of technology into learning curriculum and learning process. Research shows that the teacher is a central figure in the process of technology rich curriculum integration (Cviko *et al.*, 2011) as he is the one who makes decisions about technologies to be employed and pedagogical approaches to be used. The authors acknowledge that teacher's role changes considerably in online training (Sammons, 2003). According to Hermans *et al.* (2008), teachers who hold constructivist beliefs with a learner-centred approach to teaching and learning have a more positive attitude on classroom use of technology, whereas teachers holding teacher-centred approaches have a negative approach to teaching and learning. According to Partlow and Gibbs (2003), online courses designed on the basis of constructivist principles should be interactive, project-based, and collaborative and providing learners with some choice and control over their learning. The survey conducted by Kim & Bonk (2006) indicated a shift from traditional teacher-directed approaches to learner-centred techniques in online learning. This implies a more active use of collaboration, case learning and problem-based learning in online learning. The teacher is the central

figure in making decisions regarding the use of technologies in a course, but the methods employed need to be learner-centred.

Successful integration of technologies is not as simple as it may appear from the first glance. As Govindasamy (2002) put it, e-learning is another way of teaching and learning, but all pedagogical principles that apply to traditional classroom delivery also count in technology enhanced learning; however, they need to be extended to accommodate technological progress. Successful technology penetration into learning process requires a totally different mindset from teachers. It is also related to increasing requirements for ICT skills of teachers but not limited to those. According to Fang (2001), the interval between each generation of technology will get shorter and shorter, and that trend poses a constant threat to the users who are not technically proficient or lack motivation. Teachers' eagerness to use technologies in their teaching process is related to technical support offered to them (Ian and Lowther, 2009). Their perception of technology, which is related to them integrating technologies intoclassroom practice, is influenced by support from administration and availability of resources (Cviko *et al.*, 2011). The situation and the context allow sharing the attitude of Rosenberg (2001) who suggests that the question is not whether organisations will implement online learning, but whether they will do it well. It is not so much a question whether it should be done, but how well it is done. Besides, student's feedback is vital in course quality assurance, its revision and improvement (Brew, 2008).

Effective employment of technologies in learning requires a considerable shift of planning and activity organizing for teachers. According to Fang (2001), introduction of technology enhanced learning causes trends that appear to be so strong to make it a shift of paradigms. Preparation of high quality contents appears to be a complex task. There is a tendency to reuse the exiting learning material as it is considered that learning content could be used many times in different instructional settings (Van Merrienboer & Brand-Gruwel, 2005). Besides, different learning environments may address different learning styles and influence learner performance (Dunn *et al.*, 1995). It is also important how well the software is aligned with the learning curriculum (Whittier, 2005) and responsibility of achieving the expected learning outcomes, while using the right technologies lies on the teacher or program designers (Fang,

2001). According to Govindasamy (2002), the prerequisite of successful implementation of e-learning is the need for careful consideration of the underlying pedagogy, or how learning takes place online, as in practice this is often the most neglected aspect in any effort to implement e-learning.

The more remote/distant learning is in terms of teacher/learner relation, the more different didactic and technological decisions are to be made by those who plan and design the learning process. E.g., a simple social interactivity that may easily be achieved in the classroom because of eye-contact and emotional rapport is not so easy to be planned in distance e-learning even in case of synchronous teacher-learner communication in video connection, not to mention how difficult it is to create interactivity in asynchronous distance learning. There is a need for different technological and didactic solutions and even more – a need for a different didactic paradigm in technology enhanced learning. Fang (2001) outlines user readiness trends with technology change (Table 14).

Table 14. User readiness trends in TEL (Fang, 2001)

Trends in technology compatibility	The interval between each generation of technology will get shorter and shorter. This trend poses a constant threat to users who are not technically savvy or motivated.
Trends in the concepts of curriculum development and assessment	The curriculum design and assessment criteria both become more learner focused, and instructional design and usability become increasingly important issues.
Trends in the perspectives of learning, teaching in relationship to needs of the workforce	Today our skill-based society has transformed to a knowledge-based society where human resources are valued for their abilities to solve real world problems. These skills are knowledge driven, thus need to be sharpened continually for both graduates and lecturers.

After analyzing the different trends, Fang (2001) concludes with certain emerging common factors, such as (1) user needs and user readiness would drive the means in technology, (2) learners are the centre of learning and teaching and their role is becoming increasingly autonomous, (3) learning is no

longer limited to subject-base but rather it is becoming more comprehensive, integrated, and lifelong.

Technology has enabled a highly effective information search and storage and, therefore, there is no point in people passively gathering and remembering the information when it is available online, in the computer files, etc. and can be acquired at any time using search engines such as Google which only requires internet connection and this retrieved information can be used immediately or stored in a hard-drive. Consequently, this has changed learning patterns and the new type of education is getting the edge (Garrison, Vaughan, 2013). This type of learning is called inquiry learning, active learning (Pundak, Herscovitz, Shacham, 2010), problem-based learning or student-centred (Park, Ertmer, 2008). According to Pundak, Herscovitz & Shacham (2010), active learning is a natural evolutionary product of a changing society and is more adaptive than traditional ways of learning. Besides, this is a more meaningful type of learning and promotes curiosity and creativity of the student. As the authors observe in other studies, active learning deepens the understanding of a study material, increases student engagement and responsibility taken for student's own learning outcomes. They also noted that instead of learning the content of a course students tend to focus more on how they learn and on their thinking strategies. The most important aspect of active learning is to learn how to handle the information made available to students by internet and other resources, and use it meaningfully while developing ways of its effective organisation, analysis, application and evaluation. Pundak, Herscovitz and Shacham (2010) also state that problem-based learning enables and is enabled by higher level thinking with its key products such as argumentation, judgment of advantages and disadvantages, dealing with uncertainty and making decisions accordingly. The content is learnt as well, however, not by memorizing the material given, but by hands-on approach in solving complex problems (Park, Ertmer, 2008). Students must also learn to work independently and with less guidance in online compared to traditional face-to-face learning.

TEL may offer attractive task automation for teachers (Fang, 2001), but this aspect is not as simple as it may appear and for the qualitative learning results, more content and task automation may be needed as well (Table 15).

Table 15. Opportunities and dilemmas of TEL related to task automation (Fang, 2001)

Opportunity	Dilemma
Computerised automation allows users not to depend on a chain of division of labour by different people. • Fewer mistakes might be made as a result of less division of labour.	This is only true if the users want to be in control and welcome extra work, otherwise, they might feel they are trapped in chain of unfamiliar tasks, thus more likely to make mistakes.
Users are in total control of each task procedure; therefore, they are in control of time for delivery.	Users are easily spoiled by the deceiving speed and ease of automation and they would procrastinate on executing the tasks. • Making changes digitally is too easy so users could become indecisive in making the final version.
Users could become professionals in certain task quickly with the help of advanced software. • Users are able to visualise their ideas on the computer more quickly.	Sometimes, if users are not aware of their limited skills with the computer, their ideas can be visualised differently if they rely on professional help. • Novice users are easily deceived by professional grade software that is meant to empower professionals in the field.

As Paechter, Maier and Macher (2010) have concluded from their study, the teacher does not lose his importance in e-learning but is more valued for his expertise and support for students. Teacher's expertise in the field and in e-learning contributes hugely to students' knowledge, skills, competencies and student satisfaction with the course. A study by Graham, Woodfield, Harrison (2012) compared typical teachers in problem-based learning with experts in this area and the main differences appeared in that expert teachers collaborate more with other teachers, promote student self-evaluations and reflections on the learning process and provide students with guidelines for self-monitoring.

Overall, the authors show that teachers are becoming more of instructors, facilitators and coaches who are concerned with study materials as much as

the development of student' higher thinking skills, and soft skills enabling them to solve complex solutions. Meanwhile, students are considered to be more independent, to learn ways to be creative, organised, manage their time effectively and be active in their learning process by asking questions, being curious and taking full responsibility for their learning.

3.2 Technology enhanced learning curriculum designing

Technology enhanced teaching and learning (TEL) is a concurrent part of teaching/learning and training which has become indispensable in any form of teaching/learning or (self-)education during last decades. TEL creates independence and convenience in organizing the teaching/learning process in a comfortable way using technology-based methods of interaction and providing opportunities to choose the intensity of communication between the participants of teaching/learning process. A particular characteristic of TEL is its virtual learning medium which eliminates the limits of time, accessibility of technological equipment and information. TEL includes all ways of teaching which existed hitherto (distance, e-learning, and etc.) and can be integrated with a traditional form of teaching/learning (blended TEL). The extreme form of TEL (when face-to-face interaction in one physical area is impossible) proceeds only in virtual community on the internet.

There have been a number of discussions in research literature (Anderson, Dron, 2012, Martinez-Caro, Cagerra-Navarro, Cepeda-Carrion, 2014) on the curriculum of distance/online learning and e-learning. Although TEL curriculum is comparatively a new concept in the research literature, it is considerably broader and includes all other technology-based forms of teaching/learning (including distance, e-learning and etc.) (Martinez-Caro, Cagerra-Navarro, Cepeda-Carrion, 2014); thus, the requirements for TEL curriculum differ from specific requirements for other, narrower technology-based teaching/learning forms, as TEL curriculum elements directly depend on the teaching/learning scenario (as well as on the intensity of the use of technologies in the teaching/learning process in terms of interaction, content accessibility, support for its organisation and implementation, performance of assessment).

As stated by Cleveland-Innes and Garrison (2009), attention in TEL curriculum is focused on the community of learners itself which is sustainable and created in the virtual learning medium for a certain period of time. The planned and designed TEL curriculum can be evaluated taking into account three aspects: a) virtual learning environment planned and designed for TEL curriculum, b) TEL scenario for TEL curriculum to be used in the process of teaching/learning, c) teaching/learning taking place during TEL process, and learner success to achieve certain learning outcomes.

The most important task for TEL curriculum developers is to find an optimal TEL scenario and to prepare a TEL curriculum according to its general plan; therefore, TEL curriculum designing has a direct impact upon TEL curriculum parameters and TEL success. TEL has undergone various developmental stages in the interdisciplinary research field. Scientific research works on technologies explored technological possibilities of equipment used to access TEL curriculum, transfer data, participants' interaction issues. Social science research dealt with TEL curriculum ethics, social, psychological, cultural factors of the teaching/learning process. Whereas teaching/learning activity planning and designing in the curriculum of TEL is the most urgent issue for education science. Further TEL curriculum planning and designing and requirements for qualitative TEL curriculum will be discussed.

According to Laužackas (2008), teaching/learning curriculum should be understood in education science in its broadest sense; therefore, aiming at evaluating its quality, it is necessary to assess the processes of teaching/learning curriculum designing and teaching/learning organisation. TEL curriculum designing process can be viewed as the existing planning and designing models, highlighting their peculiar components and discussing model designing principles.

In recent years, teaching/learning curriculum designing ideas have been related to designing of constructive teaching/learning curriculum. It is the designing of the teaching/learning process which is based on experience and personal assessment, and aims at improving activity, which is constantly renewed and updated, designing distinctive individual teaching/learning curriculum projects and teaching/learning organisation scenarios.

Proponents of constructivist theory explain knowledge construction on the basis of cognitive theories, creation of social environment (Jarvis, 1999) and humanistic psychology (Rogers, 1969). As TEL mainly differs from traditional teaching/learning by interaction principles, support system, variety of used resources and feedback provision means, forms and ways, it is possible to conclude that TEL curriculum designing can also be based on traditional teaching/learning curriculum designing principles, supplementing them by additional components.

TEL curriculum planning and designing is the process of formulating teaching/learning aims which are pursued by choosing teaching/learning organisation methods consistently and foreseeing learning achievement assessment strategy; open education resource analysis is performed, teaching/learning organisation methods and teaching/learning scenarios are planned and implemented using information communication technologies. TEL curriculum is based on didactical teaching/learning curriculum designing and planning principles.

Researchers who analysed peculiarities of TEL curriculum designing (Reigeluth, 1999; Mizoguchi, Bourdeau, 2000; Verpoorten, Leclercq *et al.*, 2006) agree that neither well used TEL curriculum designing theory nor properly designed scenarios used separately cannot ensure TEL curriculum quality – harmony of all constituents is necessary. A well designed TEL curriculum which does not meet learner and teacher needs will result in unqualified studies and poor learning results. Bad TEL organisation can also fail the implementation of best designed TEL curriculum.

TEL curriculum planning and designing is presented in Fig. 8, where didactical TEL curriculum characteristics, TEL organisation decisions, IT choice decisions and curriculum development in virtual environment as well as its reflective evaluation are presented. Further, each of the constituents of TEL curriculum planning and designing will be discussed.
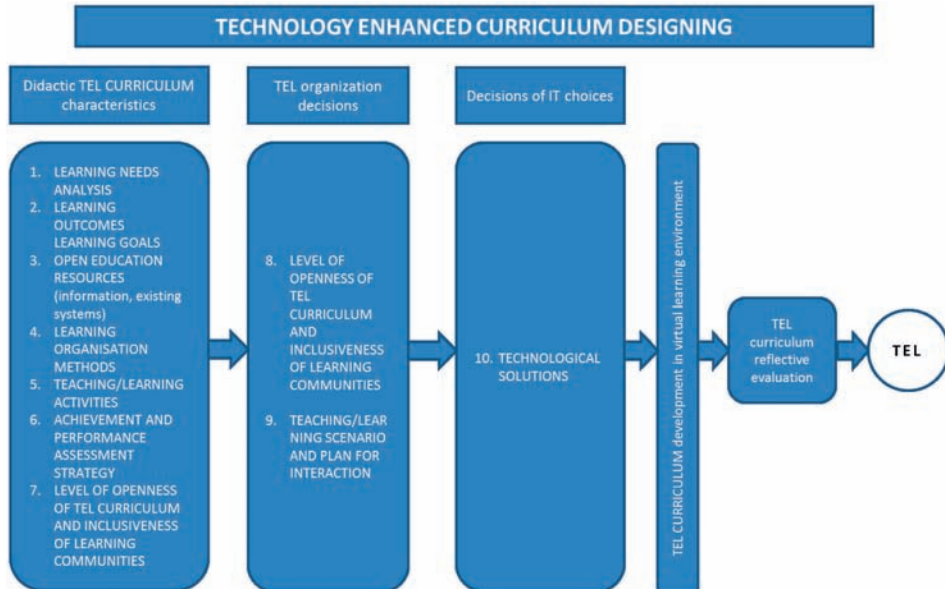
Figure 8. TEL curriculum planning and designing

3.2.1. Decisions on technology enhanced learning organisation

Another TEL curriculum requirement concerns teaching/learning scenarios. TEL curriculum activities have to enable learners to select appropriate teaching/learning methods. Various learning method classifications have been presented in research literature. Teaching/learning organisation methods are clearly classified and presented in the teaching/learning curriculum designing theory by Leclercq and Poumay (2003) (here dual (double-sided) teaching/learning organisation methods are provided). Here the first one corresponds to the learner learning method and the second – to the teacher teaching organisation method:

1) imitation/modelling;
2) obtaining information/providing information;
3) practical activity/guiding during experimentation;
4) exploration/resource analysis and recommendation;
5) creativity/enhancement;

6) discussion/moderating;

7) metareflection/formulating questions.

All teaching/learning organisation methods described in classical education science theory can be realised through TEL and offered in TEL curriculum. Variety of teaching/learning methods allows for both active and passive, individual and group work; possibility to realise the teaching/learning differentiation is an exceptional feature of TEL curriculum.

TEL organisation directly depends on possible TEL curriculum decisions. All requirements for TEL curriculum are assessed during TEL organisation. Exceptional TEL curriculum features which determine successful organisation of TEL are as follows: interaction, support systems, learning scenarios, and feedback measures and forms. Successful teaching/learning organisation depends on feedback received from all learning participants.

Learning scenarios are one of the prospective examples of future studies which join together the principles of the main future studies. They try to analyse possible future in unknown situations and prepare students for all possible situations in the future. The concept of a learning scenario in its broadest sense is explained by researchers by defining typologies of scenarios. Several scenario typologies have been presented (Börjeson *et al.*, 2005):

1. Decision;

2. Point of reference;

3. Specification of identified, stable scenarios;

4. Sequence of events;

5. Backcasting or retrospective foreseeing of the future;

6. Uncertainty dimension;

7. Cross impact analysis;

8. Modelling (Bishop, Hines, Collins, 2007).

TEL curriculum scenario has to be realised and clearly presented in virtual environment, accessible to every participant of the learning process. It is mostly realised in the form of a study or learning guide, where the whole teaching/learning or study plan is presented, responding to all possible questions. Formally such a learning scenario is a part of support provided in advance; however, it is often considered to be a separate criterion of quality.

Technology-based and traditional teaching/learning differ from each other by their means and methods of creating teaching/learning environment. Different realisation of the teaching/learning environment is particularly obvious for participants of teaching/learning process during their interaction. The importance of interaction was evaluated by researchers who analysed it: V. Thurmond and K. Wambrach (2006).

According to these authors, no clearly defined and unanimously perceived concept of interaction in education science exists. V. Thurmond and K. Wambrach (2006) state that interaction is realised on the basis of seven main principles:

- interaction is enhanced to identify student skills;
- developing reciprocity and cooperation;
- engaging in active learning;
- providing quick feedback;
- identifying the amount of time dedicated to a task;
- communicating expectations and providing knowledge about innovations and diversity;
- proper self-education and learning outcomes.

Interaction is defined using definitions of social processes. Interaction, according to scholars, happens due to the need to understand and help to understand the technology-based teaching/learning curriculum better (Thurmond, Wambrach, 2006). Researchers state that at least two participants and/or objects should be involved in the process of interaction in technology-based studies. Furthermore, at least two interactional actions have to be performed to ensure communication of agents, objects and events. Interaction can be synchronous and asynchronous. Synchronous interaction happens when its participants communicate via information technologies at the same time. Asynchronous interaction happens when participants communicate at a different time, for instance, via e-mail, exchanging messages in a discussion forum (Thurmond, Wambrach, 2006). Technology-based teaching/learning participants' interaction (synchronous and asynchronous) enables virtual learning user communities to exchange opinions, information, create a common product. Teaching/learning in a natural (traditional) environment is totally imitated in a virtual learning environment by supplementing human

communication and their reciprocal interaction by interaction technologies based teaching/learning curriculum (teaching/learning resources) increasing the accessibility to information.

Biocca *et al*. (2006) justify interaction by participation in a virtual medium, as it helps the participants of virtual teaching/learning to comprehend and foresee as well as to control specific experiences, be aware of cognitive reciprocal relations. The theory of social participation explains interaction in a virtual medium. As stated by Biocca *et al*. (2006), social participation becomes increasingly significant, as virtual space becomes more social. Social communication increases not only among users, i.e. people in this medium, but also among users and computer as well as technologies. Thus virtual space is the place for social interactions, where an increasing number of quazi-social relations are created by more innovative and complex technologies.

Social contact in technology-based teaching/learning proceeds in online learning. It is either agreed on or happens by chance. Biocca *et al*. (2006) assume that social contact is used purposefully aiming at self-expression in technology-based environment. Social participation is significant in improving teaching efficiency in technology-based studies. The authors also state that social participation can be cultural, as technology-based learning participants represent different cultural and social groups.

The perception of the impact of social participation is greatly determined by the student's understanding of the situation and his/her approach. Student's perception of interaction which is created by mass media determines the quality of participation. It is possible to state that each participant of technology-based teaching/learning partly creates his/her own social participation in interaction which proceeds in the learning environment, social being manifests individually itself for each participant.

Technologies enable not only oral communication, reading in the virtual space but also depicting one's own behaviour, information transmission by movement. As stated by Biocca *et al*. (2006), for some time a number of tasks were limited only to symbolic or oral agreement. However, interactions often lacked eye-contact, non-verbal reflection of the mind, and etc. The most obvious model of behaviour manifestation in virtual space can be computer

games. Seeing each other and being able to imitate the behaviour, players are totally engaged in the game.

To summarize, it is possible to draw a conclusion that social participation enables, enhances and motivates communication and interaction in the internet space. Interaction in online studies needs medium or link via which human-human or human-object interaction takes place. Engagement of each participant is also important as well as a possibility to express one's ideas and behaviour in internet space. All this creates social presence and helps online participants to communicate. Thus, increase in the scope of social presence phenomenon in internet environment contributes to the improvement and facilitation of interaction in technology-based studies.

3.2.2. Building social presence

Distance learning has a number of advantages, such as accessibility of materials from home, a possibility to use convenient timing for learning or posting remarks, as well as a possibility for deeper reflections in written form, when posting remarks on forum rather than participating in an oral discussion (Petrides, 2002). However, lack of interaction and feelings of isolation are often mentioned as disadvantages associated with distance learning (Blanco *et al*, 2011; Vonderwell, 2003). Social interaction among learners themselves and learners and their teacher has a huge motivating impact on the learner's morale and achievements. Social interaction allows giving and receiving direct feedback, exchanging ideas and reflecting one's own ideas. In conventional learning and in technology supported learning, supporting learners' meta-cognitive activities, like reflection and self-reflection, may increase their performance and motivation through support and guidance (Means *et al.*, 2009). According to Kirschner *et al.* (2006), providing support and guidance for novice learners during the learning process leads to a more effective approach to learning. Teachers' support can be classified in meta-cognitive, procedural, contextual and technical types of support.

Cooperative activities in learning are very important as talking to others may trigger self-reflective processes of a learner (Sandi-Urena *et al*, 2010). Despite the potential of cooperation with peers, some researchers are

sceptic regarding the use of asynchronous discussion groups. According to the research performed at the Open University in Netherlands (Puls & Van den Munkhof, 2010), students indicated that they did not use discussion groups, while those who did – indicated that it did not fulfil their expectations. In order to understand the reasons for such a failure of discussion group trainers and teachers from different faculties were asked for the feedback of the situation. The teachers reported that they felt a lack of intervention from teachers and due to the lack of time and lack of overlapping schedules of students and teachers, the discussions were not smooth, as they did not provide immediate feedback that was important for students. However, according to Rovai (2007), who has over a decade experience of online courses, online discussions are important for motivation of learners and also building a community feeling among those in the course. Trusting on the theory of social constructivism, the author argues that learning does not happen in isolation (Vygotsky, 2006) but in cooperation, when learners are building and expanding their notions, experiences and understanding in the process of discussion and sharing. Rovai (2007) suggests providing social presence in a virtual classroom and encouraging discussions, where a teacher should not be the centre of all discussions, but student-to-student interactions should be encouraged to build knowledge, learning and community. Rovai (2003) suggests that grading student participation in discussions for 10–20% of the grade considerably increases their participation in online discussions. The goal is to create the environment of positive social interaction for knowledge construction and learning. Provision of task oriented discussions may be course-wide or group-work targeted. Rovai (2007) also suggests creating a special forum rubric for socio-emotional discussions in order to build social bonding of participants and create a possibility for emotional interaction. The instructor is suggested to post a welcome message for such a socio-emotional introduction and interaction of the participants. According to other authors (Brown, 2001), socio-emotional discussions facilitate further development of social connections of participants and camaraderie in the group. According to the research performed with students in Hong-Kong (Table 16), technology enhanced learning has its own advantages as well

as limitations (Fang, 2001) in terms of learning environment, content development, information access, task automation and communication. Teachers may consider the possibilities and potential dilemmas that may be related to such aspects as possibility to compose messages at the students' own time and pace, to communicate with teachers and classmates more personally and more on equal terms.

Table 16. Opportunities and dilemmas of TEL related to communication (Fang, 2001)

Opportunity	Dilemma
Learners are able to compose their messages at their own pace and communicate to their audience selectively without pressures from their peers.	Surprisingly, learners are not proactive in using e-communication. It appears that reticent students in class could also be reticent students online. If these learners are subject to peer pressure, then communicating online or offline does not offer significant incentives.
Learners are able to exchange ideas more personally and directly.	The speed and ease of sending messages in discussion forums could also invite messages that are fragmented, irrelevant or irresponsible.
Learners can communicate frequently and directly with their tutors.	Some learners would become very dependent on their tutors and would expect response quickly regardless of the time.
Lecturers could participate in the communication as an equal partner or as a tutor, providing timely input to individuals or groups.	Lecturers who are using their mailbox to communicate would find their incoming mail quota filled quickly. • Learners might feel they are being "watched" in their discussions. • Monitoring and sorting large classes for e-communicating could be a very time consuming and difficult job.

Course designers may develop very highly structured courses with little room for learner autonomy in setting goals, execution or evaluation, or may develop much unstructured courses, allowing learners to exercise a high degree of autonomy. Using this logical construct, courses may be designed for different degrees of learner autonomy – by varying dialog and structure.

It is suggested to provide social presence in a virtual classroom and encourage discussions for student-to-student interactions to build knowledge, learning and community (Rovai, 2007). In different global open environments, learners need specific private corners for synchronous-asynchronous discussions with instructor such as a private chat, private video consultation rooms or e-mailing.

3.2.3. Developing technology enhanced learning activities

Reeves, Herrington, and Oliver (2002) identify guidelines for educational applications of authentic activities within online learning environments. They describe authentic activities as characterised by the following features: having real-world relevance, comprising complex tasks to be investigated by students over a sustained period of time, providing the opportunity for students to examine the task from different perspectives, using a variety of resources, establishing the opportunity to collaborate and reflect, having the capability of being integrated and applied across different subject areas and lead beyond domain-specific outcomes, being seamlessly integrated with assessment, creating polished products valuable in their own right rather than as preparation for something else, and allowing competing solutions and diversity of outcomes.

While designing TEL curriculum, first, the analysis of teaching/learning needs, expected competencies, existing resources and their applicability is performed; conclusions and recommendations of this analysis are drawn. On the basis of the needs analysis, the second TEL curriculum designing stage is launched, during which teaching/learning aims are formulated (on the basis of the expected competencies or learning outcomes, in separate cases – teaching/learning participant needs and teaching/learning resources), teaching/learning organisation methods are planned and teaching/learning organisation strategy is developed, TEL support system and assessment strategy are formulated.

By explaining how different learning aims and needs affect the designing of TEL curriculum, Reeves (1997) states that learner expectations are related to the most efficient form to achieve teaching/learning material. This way the expected outcome determines the organisation of the TEL process. Therefore, teaching/learning participants' expectations and continuous self-evaluation,

taking into account teaching/learning aims and learning achievements, are some of the most important TEL curriculum designing elements.

Expected learning outcomes or teaching/learning aims are essential in planning and designing any teaching/learning curriculum, programme or module. As mentioned above, TEL curriculum planning and designing are based on traditional teaching/learning curriculum planning and designing theories, thus didactical requirements remain similar. While designing TEL curriculum, coherence of learning aims, TEL organisation methods and TEL assessment strategy should be maintained. Leclercq (1998) notes that Tyler used the concept of triple consistency as far as 1950:

a) consistency between learning objectives and evaluation;

b) consistency between learning objectives and teaching/learning administration methods (also called educational strategies, according to Leclercq, 1998);

c) consistency between teaching/learning administration methods and evaluation strategy.

TEL curriculum has to realise the ideas of open learning (Collis, Moonen, 2002; Bates, 2010; Lane, 2008). While designing teaching/learning activities, the requirement is set for TEL curriculum to use and create open education resources, which is an indispensible feature of TEL curriculum. Online resources come in video, audio, media and other formats and have clearly defined Creative Commons licenses which provide opportunities to use these resources in designing TEL curriculum, where they enrich and expand the diversity of opinions, open networking possibilities in social networks, fulfil a number of TEL principles and its mission. However, learners themselves have to be the creators and users of these resources, ensuring proper utilisation of copyright and Creative Commons licenses; whereas TEL curriculum authors have to create a clear strategy and scenarios of such learning. This is undoubtedly the most significant TEL curriculum feature of the recent period, which ensures learning openness, quality and continuity after the end of the formal learning process.

Information and new knowledge presented in TEL curriculum differ from the traditional teaching/learning curriculum, as resources used for presentation of information (including open education resources) can be presented via

various cognition enhancing forms (sound, image, writing, video material, animation and etc.). This TEL curriculum peculiarity enriches the teaching/ learning curriculum, facilitates acquisition of new information and this way contributes to learning efficiency.

TEL curriculum activities and learning tasks have to be properly formalised. According to the requirements of TEL curriculum quality assurance procedure, task descriptions should contain as detailed information as possible on the compliance of the task or activity with teaching/learning aims, regulations with regard to time and means, if they are applied, and task outcome description, if applied. TEL curriculum activities and tasks have to be clearly oriented towards open search for solutions, choosing resources and means necessary for cooperation or individual learning, involving open community into discussions, and search for meaning. This way, the link between tasks and professional activity is ensured and the activity is brought nearer to the world of work.

TEL curriculum should allow learners to make decisions on the choice of technological solutions, qualified curriculum resources, curriculum format, means of communication, and all these have to be favourable for active learner (Laurillard, 2002). It is also noted that TEL curriculum should enhance independent learning and help to develop a responsible and critically thinking person who is able to make decisions on his/her own (Florian, 2012, Cleveland-Innes, Garrison, 2009).

While planning and designing meaningful teaching/learning activities in TEL environment, the initial teaching/learning aim remains the most important – to strive for and obtain new knowledge and skills. TEL environment expands the participants' opportunities and makes activity designing meaningful by creating opportunities for information accessibility, teaching/learning participant active communication and cooperation, applying information communication technologies. TEL curriculum activity definition is enriched by action or active learning scenarios (Brown, Voltz, 2005). Such an activity fosters active learner participation in decision making process deciding on how to perform the activity and what result to obtain (Muirhead, Haughey, 2003). TEL curriculum activity complexity also creates premises for continuity of the teaching/learning activities even after the end of the formal teaching/learning

process, resulting in motivation to continue the teaching/learning process and adapt it to the world of professional activity.

While designing and developing TEL curriculum activities, it is recommended to take into account the following elements (Fig. 9):
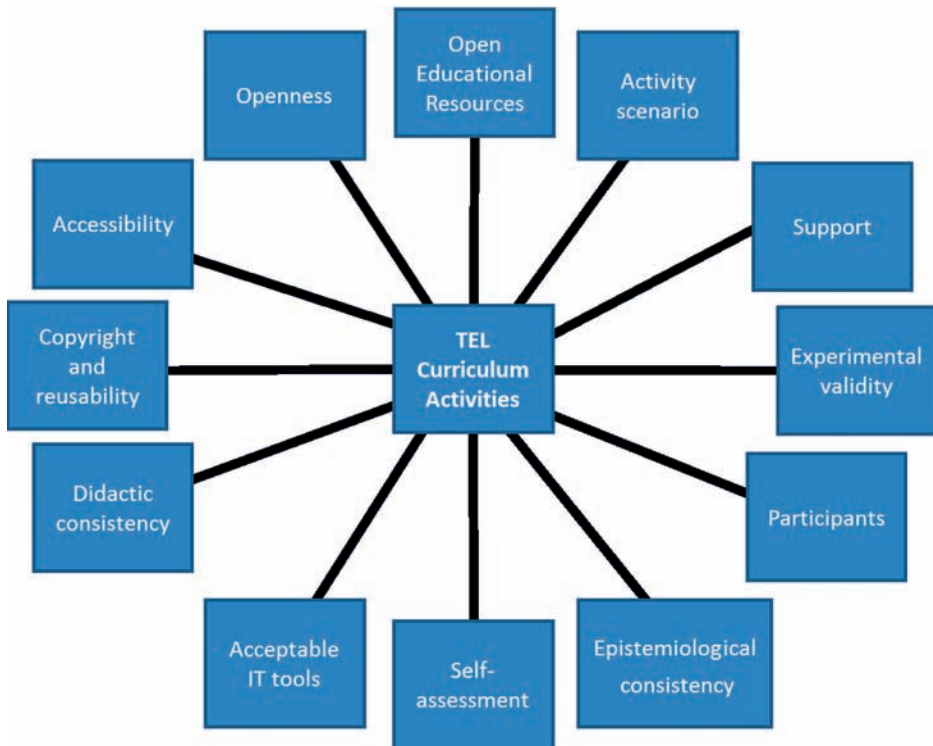

Figure 9. Elements of TEL curriculum activity planning and designing.

- Activity scenarios which would allow its smooth administration;
- Support opportunities and measures (technical and didactical);
- Possible links with the world of work;
- Teaching/learning participant preparation and motivation;
- Opportunities to present the content in epistemologically consistent way;
- Self-assessment which is performed not only by evaluating one's learning achievements but also by reflection and metareflection;
- Proper choice of ICT;
- Didactic consistency thinking about the necessity of the activity and its links with aims, methods and assessment;

• Copyright and its proper use;
• Curriculum accessibility;
• Opportunities for curriculum openness;
• Use of open education resources.

Researchers (Leclercq, 1998; Laužackas, 2008) agree that teaching/learning process is administered in a qualified way only when all study parameters – aims, curriculum, teaching/learning administration methods and etc. – comply with each other. As stated by Laužackas (1998), foreseeing teaching/learning outcomes is an essential precondition for teaching/learning curriculum quality.

An especially important didactic requirement is designing and implementation of assessment strategy into the virtual study or learning environment. All assessment methods (feedback, accumulative assessment, examination) are created in the virtual environment. During learning, the assessment can be performed in a virtual or face-to-face mode, however, all records and journals are accumulated in the virtual environment data base; every task is assessed separately providing feedback to an individual learner. Assessment criteria, related with the evaluation point, should be presented next to each task.

It is particularly recommended to use feedback as an assessment strategy. Qualified TEL curriculum activity planning will be implemented only when feedback provision and learning assessment measures are planned for the participants of active learning. Feedback interaction measures should ensure reciprocal group and individual cooperation among all participants using various measures and methods. Technological medium and virtual learning environment offer these measures to meet different communication needs; therefore, their choice and use depend of participant needs (Green, 2002).

Feedback provision is and should be implemented differently in TEL curriculum. As stated by Kulhavy and Stock (1989), learners are equal feedback providers during TEL. Impact of feedback upon learning according to Krause (2007), depends on two factors: on how it is provided and how it is received. Feedback provision is most often related to TEL curriculum with checking the right answers or reaction to information source or

expanded cognitive discussion on a certain topic. According to Moreno (2004), an expanded discussion is a much more useful form of feedback in comparison to the reactive checking of information. Opportunities of TEL curriculum to provide additional information and expand feedback by examples, links, and reflections help learner to participate in TEL curriculum development at the same time eliminating gaps of knowledge or information.

Requirements for qualified choice of TEL curriculum information technologies should ensure feedback provision by a multitude of measures: text form, video material, sound format. It is the advantage of TEL curriculum and an indispensable condition for the development of efficient feedback (DiMicco, Bender, 2007), additional interaction and learning openness as well as cooperation enhancement.

Anderson and Dron (2012) encourage development of various online teaching/learning measures which help learners to perceive new information, relate it to the earlier acquired knowledge, thus employing one's metacognitive capacities. Anderson and Elloumi (2004) state that in order to achieve good teaching/learning results and meet individual learner needs, it is necessary to ensure active teaching/learning and its analysis, reflection about one's progress, new knowledge and skills, application of new knowledge in task performance, particularly in those cases when the provided feedback is further related with the final teaching/learning outcome.

Openness is based not only on accessibility of resources but also on accessibility of learning itself for all members of society. Openness is realised by curriculum accessibility with the help of technologies and also by revealing the essence of curriculum using open education resources, information storage and other necessary information and measures. TEL curriculum should enhance accessibility of open resources, recognition of open learning, and ensure the qualified use of good quality resources (Lane, 2008; Minaar, 2013). Morrison and Anglin (2012) stress that TEL should enhance openness and diversity of resources, participants, opinions, forms and learning outcomes.

In TEL supporting learners' meta-cognitive activities, like reflection and self-reflection through support and guidance, may increase their performance

and motivation (Means *et al.*, 2009). Providing support and guidance for novice learners during the learning process, leads to a more effective approach to learning. Teachers' support can be classified into meta-cognitive, procedural, contextual and technical (Kirschner *et al.*, 2006). Supporting learners to develop their meta-cognitive skills and self-efficacy will help them to achieve learning outcomes (Blanco *et al.*, 2011). Self-efficacy, a learner's perceived ability to achieve the desired outcome, helps to focus energy on analyzing and solving problems. People with high levels of self-efficacy tend to achieve more. The research (Blanco *et al.,* 2011) shortlisted a list of topics related to the development of meta-cognition and self-development when designing and running a course: support learners in their self-reflection, provide instructional guidance, individualise instruction, support collaborative learning, plan and monitor the learning process, strengthen learner self-efficacy.

The suggested guidelines are good practices supported by theoretical and empirical research (Blanco *et al.,* 2011), and aim to help the designers of learning curriculum to create learning environments that support self-assessment and meta-cognition (Table 17): create a safe learning environment, provide easy to learn/use interfaces, thoughtfully design the learning, provide feedback/guidance throughout the learning process, promote self-assessment, collaborative learning, time management, apply progress tracking, keep up motivation.

Table 17. Guidelines to support self-assessment (Blanco et al, 2011)

No	Guideline to support self-assessment	Actions
1	Create a safe learning environment.	Provide students with a safe environment, where they feel free to express themselves, to ask questions.
2.	Provide easy to learn/use interfaces.	Mental fatigue and lack of time are the main challenges identified by students and education experts (Mok *et al.*, 2006). These characteristics make time and effort optimisation a priority in adult distance education.

3.	Thoughtfully design the learning environment.	1. Provide structured and clear learning context. A good design can improve the quality of the learning environment by structuring the visual and interactive display of learning contexts to facilitate meta-cognition.
		2. Adapt the content, format, infrastructure and strategy to individual needs of the course.
		3. Create a flexible learning environment which can be used by learners with different learning styles:
		   a. Address different learning styles by presenting material in multiple modes, such as text, graphics and audio.
		   b. Learners struggle to develop meta-cognition due to lack of awareness of their own learning process. Providing materials in different modes can help them find out which presentation type fits them best.
		   c. Learner's achievements and satisfaction benefit from learning environments where their learning style is addressed.

4.	Provide feedback/ guidance throughout the learning process.	1. Provide meaningful and in-time feedback. Appropriate teacher feedback in online courses helps students develop meta-cognitive skills. Also feedback is more effective when delivered near in time a task is performed.
		2. Provide guidance during the learning process:
		   a. Teacher's support is related to the development of meta-cognitive learners' skills ;
		   b. Additional support to instruction is more effective than minimally guided instruction. The level of support can be reduced as the learner's level of expertise increases.
		3. Keep timely contact with learners. Learners need support and appreciate teachers following their progress.

5.	Promote self-assessment	1. Self-assessment is related to development of meta-cognitive skills as well as to other skills like critical thinking, self-reflection, problem solving.
		2. Provide self-assessment throughout the whole learning process. Continuous self-assessment causes better results than post course self-assessment or no use of self-assessment.
		3. Provide different ways of self-assessment to cover all stages of the learning process:
		   a. Using computer-based quizzes as formative self-assessment method benefits learners;
		   b. Practice exams can be a good method of self-assessment before a summative evaluation;
		   c. Collaboration among learners and with teachers may assist students to assess their knowledge.

6.	Promote collaborative learning.	1. Collaboration is an effective way of enhancing meta-cognition and may increase learning effectiveness of distance learners.
		 2. Provide learners with different ways of collaboration:
		    a. Discussion groups in forums (asynchronous). Teachers may also participate, but it is important to provide an opportunity to discuss without teachers' intervention;
		    b. Chats (synchronous) ;
		    c. Choosing between synchronous and a-synchronous collaboration depending on the nature of the course and learner preferences;
		    d. Provide the infrastructure required to set up conferences.
		 3. Facilitate the creation of small collaborative groups. Students feel more comfortable and find it safer to ask, answer and contribute within small groups.
		 4. Collaboration contributes to motivation.

7.	Promote time management	1. Time management relates positively to perceived control of time, job satisfaction, health, and negatively – to stress. 2. Specify the goals of the course and highlight the important issues. 3. Provide learners with estimations of time needed to deliver a task. 4. Provide a calendar.
8.	Progress tracking	1. Using monitoring strategies in online course can help maintain motivation. 2. Set milestones. Progressive calendar deadlines help avoid procrastination and improve self-fulfilment.
9.	Keep up motivation	1. In distance education, it is difficult to maintain motivation, because learners might feel isolated, but it is desirable to maintain motivation to have a positive attitude for learning. 2. Creating a sense of community can help maintain motivation 3. Recognise learner's effort – it helps them in mastering a subject. 4. Use real life examples as it can raise motivation.

As Beck (2008) implied, a teacher has to learn ways to make students learn the material as well as develop their competencies and higher thinking skills. Students must be taught to discuss and challenge the existing knowledge, and to apply subject discourses to simple and complex problem solving in different

situations. In TEL, learner's self regulation and skills of self-directed learning play a vital role and teachers have to design TEL curriculum in a way that it supports learner's meta-cognition.

3.2.4. Successful learning process

Advantages of ICT employment in the learning process may enable cooperation among learners that are separated in time and distance. TEL opens possibilities to better engage creative, cognitive and mental potential of learners, e.g., using graphical modelling enables students to experiment, formulate hypothesis and evaluate their own model rather than just use textual representations; using online tools has a positive effect on the dialogue structure and quality of the writing product (Van Merrienboer & Brand-Gruwel, 2005). Besides, research shows that use of blended learning tools increases satisfaction not only among junior learners but also among adults in in-service training. ICT allows to present students with more information than it has ever been possible without the internet. The major pedagogical value of TEL, according to Van Merrienboer & Brand-Gruwel (2005), is a possibility to use simulations in education, as it very well relates to contemporary learning theories that emphasise real life tasks (Merrill, 2002) and focus on performance. However, there are certain aspects to be taken into consideration in order to take a better advantage of the possible opportunities and lessen the potential limitations when designing the curriculum for TEL.

The essence of learning is active information processing, classification and re-processing. Learning cannot happen only by observing others, feeling or listening. Thinking structures which are developed on the basis of the person's experience and activity are important for successful teaching/learning; furthermore, teacher activity, defined by roles and responsibility areas, is also very important for teaching/learning. These roles and responsibility areas are very much alike in traditional and technology enhanced teaching/learning: to help learners to achieve teaching/learning/study outcomes, to consult them on the issues of teaching/learning curriculum. Teachers often assume responsibility for learners' learning; however, it is necessary to create conditions which help teachers to perform their roles (they are created by teachers themselves or by

a responsible institutional unit: teacher has to know learners well, orient their learning in proper direction and trust learners, help them assume responsibility for learning). Responsibility increases while planning teaching together, learning together and evaluating learning outcomes together.

Cockbain *et al.* (2008) define successful teaching/learning as active learning. Active learning happens when in initial stages of learning the initiative and responsibility is in the teacher's hands, but gradually it is transferred to the learner, engaging him/her into activity, fostering participation and masterful acquisition. The authors indicate some active teaching/learning planning criteria:

1) dependence – it is important for learners to feel respect and approval from others as well as feel belonging to a group, then they feel recognised and are more self-confident;

2) aspiration – it is important for learners to be confident in their success and seek for it; perceive that learning has a goal;

3) security – it is important for learners to feel safe in group where they are learning, then they will take risks more often, will assume responsibility for their learning;

4) identity – learners have to know their strengths and weaknesses, know themselves as personalities, perceive their roles;

5) success – learners have to believe in their own powers and skills, as only then they will have the greatest possibilities to succeed.

Another successful teaching/learning method – problem based teaching/ learning – is based on four ideas: 1) learning is related to activity and experience, i.e. such environment has to be created for learners which provides opportunities for action; 2) cooperating community is very important in the learning process, when teachers and learners cooperate together seeking for common goals; 3) while learning, concrete outcomes and aims have to be set; 4) in the learning process a great attention has to be devoted to problem solving which requires teacher's assistance. Teacher, according to Norton and Hathaway (2008), should be a co-worker, monitor, assessor, and also a counsellor and feedback provider.

The third successful learning method is learning cooperatively in groups. Cooperation and communication during teaching/learning administration can become a successful teaching/learning support system in itself. During

technology enhanced teaching/learning administration, it is possible to implement this method particularly successfully, having chosen proper use of technologies and proper measures necessary to perform a teaching/ learning activity which is meant for group work. Suitable decisions can create spontaneous support measures, when learners cooperate, assist each other, share material. Consequently, TEL curriculum can be characterised by developed communication and cooperation measures, as an indispensible part of learning, applying both individual and multilateral communication and cooperation.

Two or more individuals who interact with each other, influence each other and are interdependent, are attributed as a group by themselves or others, have impact upon the activity, accept group norms and interests, seek for common goals – are defined in research literature as a group. Communication is very important in group activity as it is through language that individuals try to understand each other's perception, ideas and possessed experience. The goal of a number of groups is to improve learner results; therefore, learning groups should set social and academic goals. Group members have to communicate positively with each other and be able to achieve a common goal. Five major aspects are necessary for a group to be called cooperative:

1) reciprocal interdependence – learners have to know that they are necessary for each other, and are directly related in order to fulfil the assigned task;

2) enhancing interaction – group members have to support each other, encourage, enhance sharing their opinion and feelings;

3) individual responsibility – each group member must feel responsible for the task performance;

4) social skills – group members have to apply communication, leadership, conflict solving skills;

5) group processes – it is important to discuss the achieved result and set goal after each activity.

Designing the teaching/learning curriculum for traditional studies, most often the following problems arise: lack of responsibility for group members' contribution, complicated assessment of individual contribution to the common group work, moderating group work. Research indicates that absolute majority of learners wish for more contribution from group members during

the group work. During TEL curriculum designing, these problems can be solved easily using Web 2.0 technologies and applying other methodological solutions. An important and necessary condition is to properly plan the support and its administration during teaching/learning.

According to Shon (1994), during technology enhanced teaching/learning administration, it is necessary to think about what the learner has to do to perform the task. It is also worth remembering that planning an activity and designing tasks, the decisions that have been made will ensure the quality of TEL curriculum. Teachers have to immediately react to learner's needs and expectations and provide learning achievement assessment and feedback. This way teacher's liberty is ensured to act and participate reflectively in the teaching/learning administration.

In virtual learning environments, learners have their liberty of choosing when to start learning and the pace of learning. Monitoring of planning and learning relates to the development of meta-cognitive skills, as meta-cognition appears when learners plan, monitor and evaluate their learning achievements (Sandi-Urena, 2010). However, in this case the success of learning strongly depends on the level of self-regulation of learners, their ability to discipline themselves and plan their learning activities. In traditional learning environments, learning pace monitoring comes more naturally, as the teacher meets students on a regular basis and is able to monitor their progress. However, in virtual learning environment learners have to manage their learning pace and task performance themselves. This relates to potential problems as well. If learners have not developed their independence and self-reliance, a liberty of time choice may result in easily failed deadlines. Fang (2001) discusses possibilities and limitations related to learning environment (Table 18). Adults tend to have better developed time management skills than their junior peers (Trueman & Hartley, 1996), but lack of time is still a problem for adult learners as well. Therefore, the teacher's or system' support in time management in order to take most of the time available is very important to be offered for learners in technology enhanced learning environments, as it has a positive influence on their learning (Blanco *et al.*, 2011).

Table 18. Opportunities and dilemmas of TEL related to learning environment (Fang, 2001)

Opportunity	Dilemma
Learners have the freedom of choice to decide their own time, place, pace, or path to study. • Learning materials could be designed with various entrance and exit points that allow the learners to formulate their own learning strategy. • Learners can use the on-line materials as preview or/and review depending on their background and knowledge levels.	Learners are not able to fully take advantage of the opportunities. • Due to the educational experience, some students are reactive rather than proactive to learn. • Learners who are used to a teacher centred environment would be weak in self directing their study or formulating their own study strategy. • Learners visit the on-line materials or activities mostly only before examinations, therefore, they would find the learning experience overwhelming, unclear, and hard to digest.
Learners would enjoy the freedom to study at their home and avoid early classes or commuting in heavy traffic.	Some learners, mostly undergraduates, actually miss the physical congregation at a centralised place to learn. This appears to be a deep rooted institutionalised concept that exists in our learners, not to mention their social needs to elicit and validate learning experiences with peers.
Learning materials that are enhanced with various media, such as sound, narration, video, animation, graphics, etc., provide learners' choices to enhance their different intelligence or learning styles.	When students are not clear how to use the media to their advantage, they would end up having information overload and printing everything they see or hear.

According to studies at OU (Open University in the Netherlands) (Blanco *et al.,* 2011), students identify the following main challenges in their distance learning: time management, personal circumstances that interfere with the studies, concentration and motivation. According to Govindasamy (2002), e-learning content should be designed and developed in smaller manageable chunks known as learning objects (LOs) – small units of instruction that can be taken as stand-alone units of instruction even when they are not presented

within a wider content. Due to the fact that LOs are smaller fractions, they have increased shareability and reusability.

A survey conducted with seventy six graduate students in the US indicated that course design, learner motivation, time management, and ICT skills impact the success of an online learning experience (Song *et al.*, 2004). It also indicated such challenges as technical problems, a perceived lack of sense of community, time constraints, and difficulty in understanding the objectives of online courses.

Reflective TEL curriculum assessment emphasises teacher's responsibility to critically assess the developed curriculum. Education science research highlights the importance of learner's preparation for their prospective professional practice (Grogan, Andrews, 2002). In spite of this, researchers have identified a number of shortcomings in the area of teacher education and training for professional activity, indicating that most often lecturers and teachers are not inclined to learn from their colleagues (Florian, 2012); in particular, little attention is devoted to the reflective activity of self-assessment. According to researchers (Jans, 2000; Bozorgian, Alamdari, 2013), the majority of teachers consider self-assessment to be an educational fad. Reacting to this opinion, it is necessary to explain that to teach each learner how to perform the process of self-assessment, how to use the assessment results in identifying teaching/learning guidelines and applying one's skills in the labour market are the most complicated tasks.

Summarising it is possible to state that TEL curriculum is planned and developed following didactical teaching/learning curriculum (understood in its broadest sense) principles, but raising additional requirements for open, flexible and innovative learning implementation. TEL curriculum in its broadest sense is the use of technologies in teaching curriculum planning and development, estimating the needs and necessity for technology-based interaction, support system, information accessibility, activity and task performance intensity.

TEL curriculum consists of information presented through different technological tools and formats (including open education resources), learning activities and tasks, communication and cooperation measures, assessment and feedback tools and measures, which are developed in virtual

learning environment. The level of TEL curriculum openness is planned and determined during curriculum planning and designing. TEL curriculum teaching/learning scenario is developed before TEL process, however, it can be changed during TEL. Exceptional TEL curriculum features are open education resources, TEL activities, openness, TEL scenarios, support systems and use of technologies in learning.

Requirements set for TEL curriculum can be divided into didactical, learning administration, and adaptability of information technologies. A planned and developed TEL curriculum exerts a direct impact upon TEL organisation; however, TEL curriculum and TEL depend on each other and can affect each other.

To conclude, TEL curriculum design is the key component to create efficient and effective TEL services. TEL authors should ensure effective activity design scenarios, openness of learning process, integrated assessment solutions and authentic activities online.

3.2.5. Decisions on selection of information communication technologies

Paulsen (2003) presents a description of teaching methods, devices and technologies, indicates various mechanical instruments, audio and video means, physical tools and material which can increase the efficiency of adult teaching/learning process. However, Paulsen uses the classification of computer communication devices presented by Rapaport (1991, cited in Paulsen 2003), where all devices of communication and support are divided into four groups: information devices, e-mail systems, notice board systems and computer conferences. These devices comply with four methods when the interaction is "one and internet environment", "one to one", "one to many", "many to many" (Figure 10).

Paulsen (2003) also includes teaching/learning technologies which help to achieve learning aims, and presents them according to the classification of devices used for computer communication.
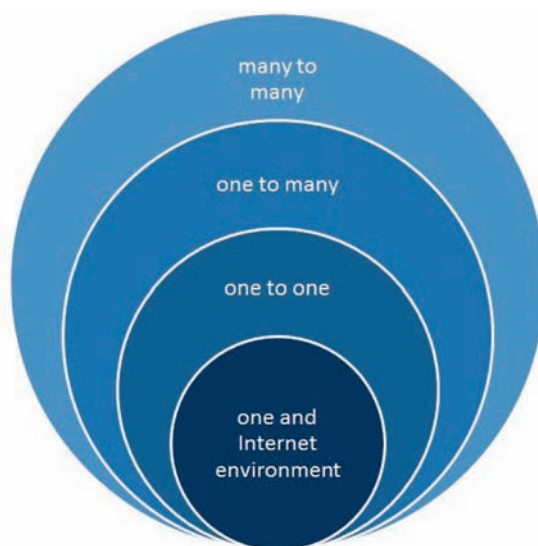
Figure 10. Computer communication device classification according to Paulsen (2003)

Today a number of users use services which allow receiving and transmitting digital information of various kinds. It means that there are excellent conditions in the market to develop teaching/learning curriculum projects and education services, which provide benefits both to users and to the whole economy. However, the advancement of this area is still slow, as sector lack of ICT competence is often encountered in the education. Atkins, Brown and Hammond (2007) note that TEL curriculum has to be accessible via all digital forms and that various digital forms have to be supported by different technological devices. Besides, TEL has to ensure all possibilities for interaction (Biocca et al., 2006): synchronous, asynchronous, blended, individual, group, meant for cooperation with support of environment, in image or sound format – according to learner possibilities and choices.

Teachers who develop TEL curriculum in virtual environment have to be supported in selecting technological tools with regard to TEL curriculum project, not on the contrary. The provision of support would prevent from deduction of methodologically appropriate solutions based on lack of teacher competence; on the contrary, sharing experience and case study descriptions, presentation of experience and good practices analysis would allow teachers to

develop individual teaching/learning curriculum projects, the implementation of which would be supported by technologies.

In higher education area research, the following groups of information technology devices are mentioned as most often used for TEL curriculum implementation in virtual environment: communication and social interaction devices enhancing cooperation in groups, communication with the teacher, feedback provision measures, sources accessible via internet such as databases, library catalogs, teaching/learning administration tools as well as assessment measures.

In TEL curriculum, all didactical measures and learning scenarios can be realised through information technology devices. However, it is important how these devices are selected. Bates and Sangra (2011) suggest the following criteria for technology selection: accessibility, price, learning didactical characteristics, interactivity maintenance and user friendly solutions, organisational aspects and needs, novelty and speed (see Fig. 11).
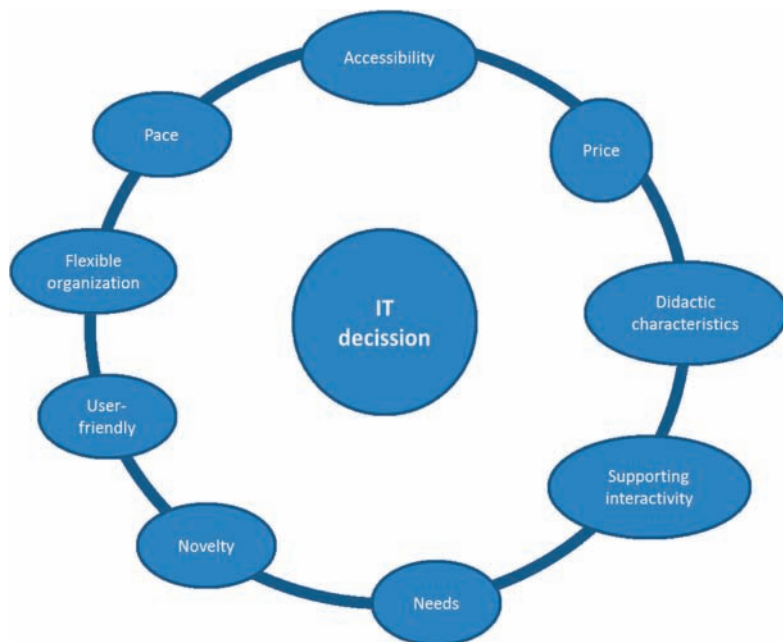

Figure 11. Technology selection criteria (according to Bates and Sangra, 2011)

3.3. Open educational resources for technology enhanced learning

In recent years, scientists around the world have been widely discussing about Open educational resources (OER), and a great number of OER have been used all around the world. To understand this growing trend, it is important to define OER and understand the influence, spread and popularity of this phenomenon. A lot of repositories of learning and teaching resources are accessible freely for everyone. Numerous scientists (Smith, Casserly, 2006; Hylen, 2006, 2012; Atkins, Brown, Hammond, 2007; Downes, 2007; Geser, 2007; Wiley, 2006, 2007; Friesen, 2009; D'Antoni, Savage, 2009; Butcher, 2011; Wiley, Green, 2012) analyse the beginning and development of OER. The term of Open Educational Resources (OER), first adopted at a meeting sponsored by the William and Flora Hewlett Foundation at UNESCO in 2002, refers to digitalised materials offered freely and openly for educators, students and self-learners to use and re-use for teaching, learning and research. The initial concept was further developed as technology-enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes. OER are teaching, learning and research materials in any medium that reside in the public domain and have been released under an open license that permits access, use, repurposing, reuse and redistribution by others with no or limited restrictions (Atkins, Brown & Hammond, 2007). OER are typically made freely available over the web or the internet. Their principle use is by teachers and educational institutions to support course development, but OER may also be used directly by students. OER include learning objects such as lecture material, references and readings, simulations, experiments and demonstrations, as well as syllabuses, curricula, and teachers' guides (Wiley, 2006).

The Hewlett Foundation offers a definition of OER that is shared by UNESCO (2013) – teaching, learning and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules,

textbooks, streaming videos, tests, software, and any other tools, materials or techniques used to support access to knowledge. Geser (2007) offers a more practical definition of OER by outlining their main features: (1) access to open content (including metadata) is provided free of charge for educational institutions, content services, and the end-users such as teachers, students and lifelong learners, (2) the content is liberally licensed for re-use in educational activities, favourably free from restrictions to modify, combine and repurpose the content; consequently, the content should be ideally designed for easy re-use in that open content standards and formats are being employed, (3) educational systems/tools software is used for which the source code is available (i.e. Open Source software) and that there are open Application Programming Interfaces (open APIs) and authorisations to re-use web-based services as well as resources (e.g. for educational content RSS (Rich Site Summary) feeds). OER relate to three major areas of activity: (1) creation of open source software and development tools, (2) creation and provision of open course content, (3) development of standards and licensing tools.

OER is not synonymous with online learning, e-learning or mobile learning, although some people use the terms interchangeably; however, the use of OER can support open learning/open education, and the main purpose of OER is to provide open access to high quality digital educational materials. Johnstone (2005) characterises OER as learning resources (courseware, content modules, learning objects, learner-support and assessment tools, online learning communities), resources to support teachers (tools for teachers and support materials to enable them to create, adapt, and use OER), as well as training materials for teachers, and other teaching tools and resources to assure the quality of education and educational practices. OER are considered to be important assets, since they may provide high quality resources with a Common Creative License or equivalent to all interested learners, teachers or organisations on a global scale (D'Antoni, 2008).

3.3.1. Types and possibilities of OER

The term Open educational resources is defined very broadly and may include curriculum materials like lecture or course materials as well as educational software like computer-based simulations and experiments. The term OER is largely synonymous with another term: OpenCourseWare, or OCW, although the latter may be used to refer to a specific, more structured subset of OER. An OpenCourseWare is defined by the OCW Consortium as a free and open digital publication of high quality university-level educational materials. These materials are organised as courses, and often include course planning materials and evaluation tools as well as thematic content (Butcher, 2011).

OER may be classified in a variety of systems that are suggested by different scholars (Hylén, 2005; Margulies, 2005, in OECD, 2007; Wenk, 2010):

• Learning content: full courses, modules, courseware, curriculum maps, teaching notes, learning objects, exercises, collections and journals courses, references to collections and archives, textbooks, simulations and role plays, student guides, streaming videos, multimedia applications, podcasts, assessment tools and instruments, databases.

• Tools: software to support the development, use, reuse and delivery of learning content, including searching and organisation of content, content and learning management systems, content development tools, online learning communities, simulation tools, apps (including mobile apps) and hardware tools, like electronics prototyping platforms (such as Arduino).

• Implementation resources: intellectual property licenses to promote open publishing of materials, design principles of best practice and localised content.
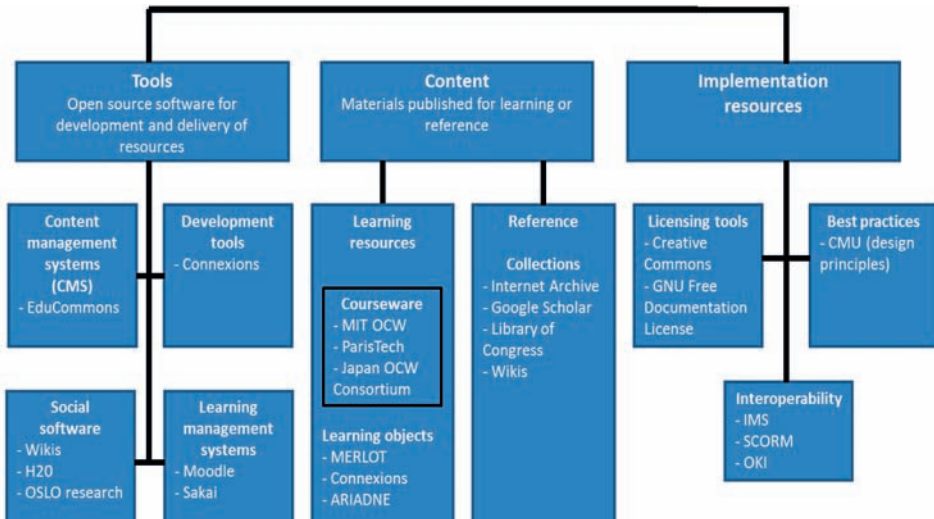
Figure 12. Open educational resources: a conceptual map (Margulies, 2005, in OECD, 2007)

According to Schuwer & Mulder (2009), the main advantages of OER are:

• Flexibility – open, time independent and easily accessible;

• Cost-effectiveness – requires individual time investment and effort, but no any out-of-pocket expenses as no learning materials or specific software have to be bought and the content is self-contained;

• Convenience – a standard personal computer with internet access and web browser is sufficient;

• Individualised – offers opportunity to become familiar with studying at higher educational levels with minimised stress levels, as it involves online self-paced learning in the learner's own environment, and the learner may then decide whether he or she is ready to take the step to formal recognition of a performance by means of the additional services provided for assessment and certification;

• Accessibility – complements and facilitates access to e-learning as individuals can be offered easily accessible experiences with online learning, even those who do not belong to the generation that has grown up since the outset with computers and the internet.

OER hold a transformative educational potential as increased availability of high quality, relevant learning materials may contribute to more productive students and educators (Butcher, 2011). Removing restrictions around copying resources may reduce the cost of accessing educational materials. The principle of allowing adaptation of materials provides a possible mechanism for students becoming active participants in educational processes, who learn best by doing and creating, not by passively reading and absorbing. Content licenses that encourage activity and creation by students through re-use and adaptation of that content can make a significant contribution to creating more effective learning environments.

According to UNESCO published Guidelines for Open educational resources in Higher Education (2011), the transformative educational potential of OER may also be maximised through different practices and procedures that their providers should incur. Peer review processes may improve the quality of learning materials. Capacity for the creation and use of OER would increase if it were treated as part of the professional development of academic staff. Using OER in education could increase serving the needs of particular student populations such as those with special needs and serving students in their local languages. Involving students in the selection and adaptation of OERs would engage them more actively in the learning process.

The importance of OER has been widely documented and demonstrated recently in conferences and declarations dedicated to the support of OER to the development of resource repositories and other services. Educational institutions around the world have been using the internet and other digital technologies to develop and distribute teaching and learning. Recently, OER have gained increased attention for their potential and promise to obviate demographic, economic, and geographic educational boundaries and to promote life-long learning in a personalised way.

OER can make a significant contribution to such educational processes as continuous development and improvement of curricula and learning materials, ongoing program and course design, development of quality teaching and learning materials, design of effective assessment tools for diverse environments. Various lifelong learning providers, educational, consulting, business institutions should be interested in the promotion and development

of OER that help to equip teachers, students, workers and other learners with the competencies, knowledge and skills to participate successfully in the LifeLong Learning process. The Open educational resources are a technology-empowered effort to create and share educational content on a global level as well as an educational opportunity to learn from others and to teach others. Furthermore, OER is an access to free education for everyone.

3.3.2. OER – free and open

Open educational resources are educational materials that are either (a) licensed under an open copyright license (e.g., Creative Commons) or (b) in the public domain. In both cases, every person in the world enjoys free (no cost) access to the OER and free (no cost) permission to engage in the "4R" activities (Wiley & Green, 2012) when using the OER:

• Revise – adapt and improve the OER so it better meets your needs.

• Remix – combine or "mash up" the OER with other OER to produce new materials.

• Reuse – use the original or your new version of the OER in a wide range of contexts.

• Redistribute – make copies and share the original OER or your new version with others.

Alternatively Foote (2005) defines "Four Freedoms" referred to OER:

• Freedom to copy;

• Freedom to modify;

• Freedom to redistribute;

• Freedom to redistribute modified versions.

Most of OER users are interested in OER being freely available, open and free of charge. Teachers are interested in the possibility of edited OER to customise for their lectures, as this may significantly reduce the time required to prepare lectures. The resulting variety of materials (and didactical concepts) also stimulates students (Wenk, 2010). It is important for researchers to complement OER by new appeared facts (example of Wikipedia). According to Wenk (2010), only 15.3% of the users of OpenCourseWare content are educators, 31.4% are students and 48.2% are self-learners.

Open Learning is predicated on the belief that openness in many forms is a key element to reaching out to as many people as possible, removing some of the barriers presented by more traditional forms of education (Lane, 2008). However, while such learning may be openly available in principle, there can still be many barriers to some groups accessing or availing themselves of those opportunities (Wilson, 2008). An open license is a standardised way to grant permission and to state restrictions to accessing, using, repurposing, reusing or redistributing creative work (whether sound, text, image, multimedia, etc.). In its simplest form, the concept of OER describes any educational resources (including curriculum maps, course materials, textbooks, streaming videos, multimedia applications, podcasts, and any other materials that have been designed to be used in teaching and learning) that are openly available for use by educators and students, without an accompanying need to pay royalties or license fees (Butcher, 2011).

Open licenses have emerged in an effort to protect authors' rights in environments, where content (particularly when digitised) can easily be copied and shared without permission. Open licenses seek to ensure that copying and sharing happen within a structured legal framework that is more flexible than the automatic all-rights-reserved status of copyright. They allow permissions to be given accurately, while releasing the restrictions of traditional copyright. OER are a part of this process (Guidelines for Open Educational Resources (OER) in Higher Education, 2011) as they allow for more flexibility in the use, reuse and adaptation of materials for local contexts and learning environments, while allowing authors to have their work acknowledged.

To summarise and to conclude, TEL designing evokes challenges to users and TEL service developers but also opens enormous opportunities to create open, interactive, accessible, quality learning services for diverse target groups and to provide these services globally. In order to design a TEL curriculum, first, a shift of teaching paradigm is needed to create effective TEL teaching practices. A shift in attitude, new knowledge, skills and experience, changes in planning and organizing learning are needed. TEL curriculum specific characteristics should be well identified and communicated to staff of the organisation creating TEL services. Interaction and social presence are among the key issues to think, as well as definition of TEL curriculum designing and

TEL organisation processes. The potentials created by technology should be revealed in TEL curriculum, such as interactivity of learning process, facilitated search of resources and information, creative and collaborative activities, and open learning. Developing TEL activities, not only didactical parameters should be taken into consideration, but also learning support, experimental validity, learner needs and possibilities, integration of open educational resources, and other TEL activity elements. TEL becomes a successful learning process when it creates possibilities for better cognitive, emotional engagement and learner satisfaction.

OER play an important role in TEL curriculum designing. OER contribute to quality resources, to continuous improvement of learning resources used in TEL curriculum and to access of TEL services.

To conclude, TEL curriculum has specific characteristics that need to be described within an organisation and shared internally with all staff members. TEL curriculum concept has developed very fast recently and now it embraces other related concepts (like e-learning, online learning, blended learning, and other). TEL curriculum epistemology is mainly based on constructivism and connectivism theories. TEL curriculum designing (planning and implementation) characteristics differ from TEL organisation characteristics, but both phases of TEL designing directly affect each other. Interaction (synchronous and asynchronous) is a specific and outstanding characteristic of TEL curriculum researched from different perspectives. Social presence and support systems are key elements affecting not only TEL curriculum designing, but overall TEL integration areas within the organisation (administrative decisions, information technology infrastructure, quality assurance, internal and external communication, and continuing professional staff development). Support systems are a part of integration criteria groups, but also play an important part as a requirement set for TEL curriculum designing.

TEL activity development becomes the central planning element in TEL, including TEL activity implementation scenario planning: didactic consistency, learning resources, experimental validity, collaboration types, technological tools to implement activity and to present its outcomes, openness, and other issues. Taken into consideration all benefits that technologies bring to learning activity, scenario becomes the crucial part of cognitively and emotionally

engaging learning enhanced by technologies. Technologies should be chosen accurately to implement a TEL activity scenario on the basis of the number of participants, their collaboration, didactical characteristics, user needs, novelty, user-friendly solutions and the price. OER play a very important role in TEL activity quality assurance, TEL curriculum continuous improvement and feeding teachers and learners with quality resources, as well as opening up TEL services for diverse target groups.

4. Continuing professional staff development

The success of using technologies in education depends not only on the development of ICT tools, but even more important are organisational or even personal factors that influence the need for technological process. Professional development should be implemented and encouraged by adjusting suitable methods that respond to both organisational and staff needs, and fulfilling policy, strategic goals and values of the organisation. Organisations that seek to assure highly qualified personnel and at the same time competitive activities of the institution need to assure that personnel is qualified in the specific field, and there is a strategic plan for continuing and consistent further professional development at the workplace. However, individual staff responsibility and motivation to develop professional competencies also plays an important role.

Apart from the system for professional development, there are more factors that must be considered as possible challenges for lecturers using ICT: learning-friendly organisational culture, using organisation's internal resources for providing learning possibilities to teaching staff, identification of individual learning needs; evaluation and validation of competencies as well as harmony between learning processes and strategic goals of the organisation. To tackle a lack of motivation to start using new technologies, D'Este & Perkmann (2010) distinguish four main reasons that encourage lecturers to involve more actively into new activities: commercialisation (commercial development of technology and knowledge), learning (feedback from other parts about the process), possibility to use various funding resources and possibility to use

all material, data and technologies for learning and researching purposes. The potential competencies that teachers need to use TEL may include good knowledge of the subject, ability to coordinate work and provide feedback in distance, ability to develop learning competencies, accept and tolerate differences and provide constructive criticism. Teachers who want to integrate ICT into a study process should inevitably have technological competencies as well as administrative, curriculum management, learning coordination and evaluation competencies. Ryymin, Palonen & Hakkarainen (2007) indicate that teachers who are entering TEL domain need different types of expertise in terms of bridging subject area and pedagogical knowledge as well as that of using ICT. These professionals demonstrate hybrid expertise (Ryymin, Palonen & Hakkarainen, 2008) which integrates teaching practices and tools that cross expertise boundaries of different subject domains. They may also connect members from other networks to form interdisciplinary teacher network communities where they may exchange their expertise and share innovative practices among themselves. Ryymin, Palonen & Hakkarainen (2008) argue that teachers' professional community networks have high potentials for peer learning and professional development of teachers' skills in TEL.

Many of faculty members who are currently teaching online courses might not have taken online courses ever before, since TEL offerings were not available then. Therefore, it seems necessary for instructors who are planning to teach online to consider taking at least one online course plus some ongoing faculty development training on issues of e-learning.

Web-based technologies can improve access, equity, and quality of professional learning opportunities, at the same time establishing online cohorts of teachers in courses can provide rich interactions and ongoing or work-embedded support (Robinson, 2008; Dede, Ketelhut, Whitehouse, Breit, & McCloskey, 2009, p. 9). Researchers (Moore, Kersley, 2005) stress that implementation of TEL might be good to start with teacher education since teachers are invariably keen to transfer TEL disciplines to their students.

Bawane & Spector (2009) identify 8 main roles of the teacher performing online:

1. Pedagogical (content expert, organiser, instructional designer, tutor);
2. Social (support for students, facilitator);

3. Evaluator (monitors and assesses students);

4. Administrator/manager (manages time and course);

5. Technologist (selects appropriate resources for learning, has awareness of synchronous and asynchronous communication tools);

6. Advisor/Counsellor (provides guidance, motivates students);

7. Personal (positive attitude to e-learning, sensitivity to students);

8. Researcher (researches classroom teaching, reflects about teaching practice).

According to Angeli & Valanides (2009), teachers need to be explicitly taught about the interactions among technology, content, pedagogy, and learners in order to effectively use technology to improve learning. Pedagogic change in online learning might be understood in terms of the development of the teacher's knowledge of how to teach effectively with technology.

Georgina & Olson (2008) implemented a study to determine how faculty literacy and technology training impact their pedagogy, which, according to the study, is directly correlated. Moreover, the researchers state that technology training may be maximised for the integration of pedagogy. By technology training the authors use technological literacy concept defined by Shackelford, Brown, and Warner (2004, cited by Georgina & Olson, 2008) as "the capacity to "design, develop, control, use and assess technological systems and processes" (p. 7). Researchers ensure that the most effective training is peer to peer training; however, discussion forums, workshops and other forms of training are recommended by the authors.

Teaching with TEL requires not only strong technical support but also competent lecturers and teachers ready to teach online. Thus it is very important that teachers who use TEL are not only good specialists in their research area, but are equally able to administer and ensure efficient learning process in the virtual space. Due to this reason lecturers and/ or teachers who teach online should have certificates attesting their appropriate qualification (National Education Association (hereinafter, NEA, 2006). TEL requires not only ability to develop the teaching curriculum, but also to adapt it to the use in the virtual space, to adjust it to a concrete learning platform. In the contemporary society, TEL providing lecturers/teachers are required to develop their professional qualification to be able to adjust learning environments for

qualification development of business or other external organisation staff. The aim to adapt the existing teaching programmes to the needs of concrete organisation employee in-service training is a big challenge for teachers. Thus, to avoid difficulties at this stage, TEL programming specialists and providers should give teachers a sufficient amount of time and resources to be able to prepare fully for TEL. NEA present guidelines how to organise online training and suggest that before organizing and designing online training, teaching conditions should be created for teachers to develop their professional qualification in the following areas:

• Appropriate communication. Teachers who teach online have to develop appropriately sounding online voice and tone, as learners do not always have the advantage of seeing the teacher's facial expression or body language;

• Appropriate and timely feedback. As online courses do not always have exact direct online meeting time, timely presented feedback would allow teachers to ensure that they respond to student questions, worries and this way make learners confident that support is always nearby.

• Coordination of discussions. Teachers should be able to efficiently facilitate the discussion organised in virtual space.

• Group work and project coordination. Efficient group work in virtual space can face a number of barriers, therefore, teachers have to be able to apply appropriate methods and develop appropriate strategies for efficient work in small groups.

• Adaptation of learning curriculum and material for virtual teaching. In order to meet learners' needs, teachers should be able to adjust the learning material and curricula to be used in virtual space.

• Adaptation of online tools for efficient teaching process. In order to achieve maximum results of virtual learning platform, teachers should be able to select, adjust and use different online teaching tools, including synchronous and asynchronous communication methods, text-based and multimedia-rich documents, simulation tasks and etc. (NEA, 2006, p. 11).

European ICT Professional Profiles (CEN, 2012), designed by the members of European Standardisation Committee and other stakeholders, single out essential stages which underlie ICT professional (teacher, technical staff) development (Fig. 13).
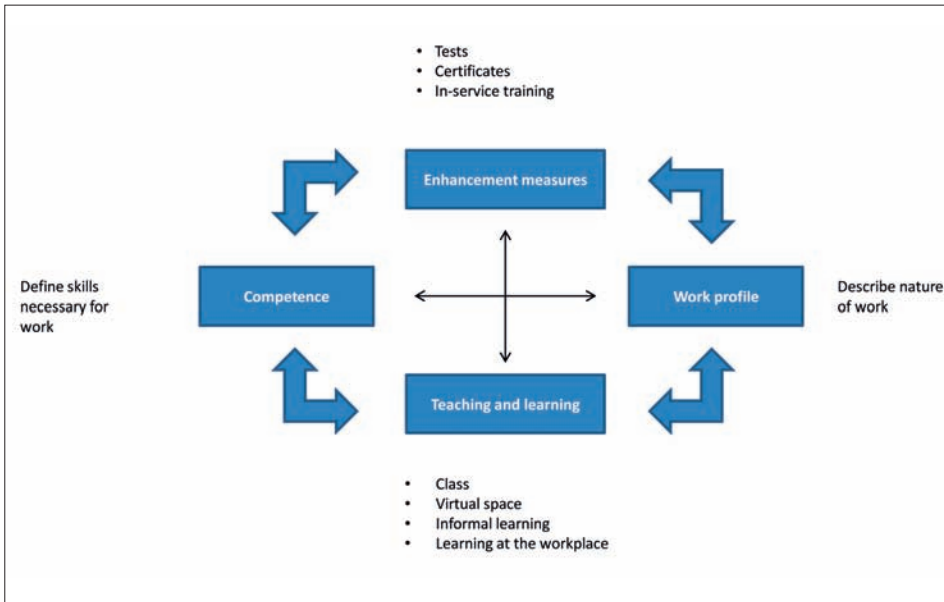
Figure 13. Essential stages for periodic ICT professional development.
(Source: European ICT Professional Profiles, CEN, 2012, p. 8)

Figure 14 illustrates four elements which reveal the essential process of in-service training and development. Work profile shows the nature of employee's work, activities and areas the specialist will be responsible for.

Teaching and learning are oriented to ICT specialist's in-service training aiming at creating conditions for him/her to pursue higher and better results and expand his/her capacities. At this stage, in-service learning and learning on the work place play a significant role. E-Compentence helps ICT professional to expand his/her activities in the virtual space, thus highlighting organisation's strengths and weaknesses in online learning administration. Enhancement measures are often applied aiming at recognizing person's achievements during a certain learning period and assessing as well as recording in-service training processes.

ICT professional in-service training is an indispensible process targeted at ensuring qualitative and novel program development, designing and implementation processes. To be ready to react in an operative and qualified manner to the needs expressed by learners and enterprise leadership or other

customers with regard to employee's personal development or in-service training, it is necessary to ensure appropriate qualification and competencies of the participants of online learning organisation process (teachers, ICT specialists). The document developed by the European E-Competence Framework (2010) presents 36 competencies based on four dimensions:

Dimension 1 – 5 e-Competence areas derived from the ICT business processes: Planning-Building-Running-Enabling-Managing;

Dimension 2 – A detailed description of e-Competencies for each area;

Dimension 3 – Proficiency levels of each e-Competence, related to the European E-Competence specifications and corresponding to levels 3–8 defined in the European Qualifications Framework;

Dimension 4 – Samples of knowledge and skills, visualizing descriptions provided in Dimension 2 (European e-Competence Framework, 2010).

Competencies identified in the European e-Competence Framework are analysed on the basis of all four dimensions.

European e-Competence Framework includes various possible ICT management and organisation levels in order to ensure smooth and consistent activity. These competencies are oriented to ICT professionals who design and manage IT programmes, learning platforms, ensure support systems for learners, teachers, third parties or other customers. The identification of these competencies can become a useful tool for performing selection of employees in ICT area, including in online teaching.

Simpson (2000), having analysed student support needs in online learning, stated that, according to students, teachers should also be characterised by:

• Good subject matter competence;
• Friendliness, openness;
• Ability to perform curator's work;
• Ability to provide feedback about performed activities;
• Development of learning skills, empathy;
• Ability to accept and tolerate differences;
• Ability to provide constructive critique (Simpson, 2000, in Krivaitė, 2007).

The results of this research revealed that the competencies of teachers who organise or are willing to organise online training include technological

competence, alongside with administration, training curriculum development, training coordination and assessment competencies which are very important and often become essential competencies. Shank (2004) has shortlisted a set of competencies for teachers who work online. A number of these competencies have been highlighted by other online training experts who design programmes or recommendations for online training course development or teacher as well as specialist training (Smith, 2005, NEA, 2004).

Administering

The initial aim is to ensure smooth online learning procedures and reduce teacher's as well as learner's overload. Teacher should provide coordinating instructions, clear goals, activity areas and indicate the expected results, present the training course material beforehand (program, compendium, discussion themes), inform students about changes and updating, ensure all learners' participation, provide timely responses to learner inquiries, transfer the arising problems to appropriate signposts and ensure their solutions.

Designing

The initial aim of curriculum designing is to ensure adequate learning results and learner satisfaction. Aiming to achieve these aims, teachers have to plan activities which would add value for training curricula, create possibilities for practice and knowledge application, model the training curriculum in order not to overload the learner, help learners to self-evaluate their achievements and search for intended goals, involve social aspects, create a realistic environment, present diverse opinions and ideas, and ensure easy access and use of the training material.

Facilitation

The initial aim is to provide ICT possibilities for social interaction and expand training boundaries. Teachers should set communication rules and discussion monitoring norms, create possibilities for online discussions and

debates, moderate discussions, contribute with their, as specialists', insights, develop discussion monitoring methods, and also ensure sharing of knowledge, responses to questions, and experience and cooperate in as many of various methods as possible (intranet, emails, printed information). Teachers should be able to react to the process of discussion adequately, without taking the discussion steering wheel into their own hands, provide information about the learner's contribution and achievements and moderate clash of opinions and group work problem solving results.

Evaluation

The initial aim of the assessment is to ensure that learners know their evaluations and to help them achieve learning program outcomes. Thus teachers should present a clear assessment system and requirements for learners, to help those who face difficulties in performing tasks, create conditions for learners to be able to follow task grading and this way help them to perceive the impact of intermediary tasks upon the final evaluation. Teachers should provide assessment results as soon as possible. Besides, they should present feedback, provide opportunities for improvement if necessary and contact those students who did not perform the tasks and help them to surmount that difficulty.

Technological competence

The initial aim is to overcome barriers which arise due to technical components. Teachers should become skilled in using all technical systems necessary to be used in the training program, and help learners to localise technical problems, inform appropriate sources about the arising problems and solve them (Learning Peaks, 2004).

A strategy and system should be created for the development of these competencies, otherwise teacher involvement into online training process can be insufficiently qualitative, or could cause confusion in making decisions on learning planning, organisation and realisation issues. There is no doubt that a number of necessary competencies can be acquired by teachers while working, i.e. learning in the workplace. Teachers have to become independent

and autonomous providers of online teaching/learning; therefore, it is very important to acquire all competencies necessary to ensure a qualitative and smooth process. Thus, it is most important to ensure continuous support from the part of specialists in this process.

Success of TEL in a study process depends mostly on organisational strategy and system which involves continuing professional development of lecturers and different internal resources including a support system. Besides, personal factors related to competencies that lecturers must acquire or improve are very important. At the same time, wider technical solutions could be offered with detailed guidelines to allow lecturers learning independently and improving their competencies.

Teaching staff need to have continuous learning possibilities and profession encouragement for new pedagogical models for TEL design, development, implementation and assessment.

To summarise and to conclude, staff professional development is another crucial factor for TEL integration into an organisation. Staff directly involved in TEL service provision should be highly qualified, motivated and responsible. Different factors affect staff readiness to implement their duties: organisational culture, resources, competencies, support system available in the organisation, and other factors.

Academic staff providing TEL services usually plays a lot of roles within the organisation, such as administration of learners, designing TEL activities, facilitation of TEL, evaluation of learning results, implementation of research, marketing and others. This is not a good practice but true experiences identified in the scientific research.

To conclude, in order to implement TEL services, staff competencies should be developed on continuously, allocating resources adequately to the budget of TEL services, to train staff on participation in online communities, on ICT pedagogical (didactical) competencies, TEL curriculum designing and TEL organisation. Continuing professional staff development should be organised the way that allows staff to be aware of the training possibilities, so that these possibilities allow updating competencies constantly on the basis of ICT competence framework existing within the organisation.

5. Support systems

Skills in technology management, participant preparation to use technologies, selection of technologies and their functioning in the teaching/learning organisation are very important for the organisation of technology enhanced teaching/learning. The most efficient way to reduce the impact of negative factors upon successful teaching/learning is implementation of support system. Support planning and organisation is an essential and exceptional technology enhanced teaching/learning feature, which affects social, psychological, cultural and philosophical teaching/learning climate.

Support and teaching/learning conditions are created differently in the case of traditional and technology enhanced teaching/learning. Technology enhanced teaching/learning is directly impacted by support systems. In many cases this form ensures the development of learning opportunities for a modern learner (opportunities are created to choose individual learning pace, time and location), i.e. learning accessibility and principles of autonomous and individualised learning. Possibility for learner to access to each other and have interaction with the lecturer highlights the advantages of technology enhanced teaching/learning as individualised teaching/learning, but support during teaching/learning has to be properly planned and properly organised. Decisions made during the process of TEL curriculum designing directly affect teacher activity and support planning as well as organisation. Improperly planned support and its organisation can have an essentially negative impact upon technology enhanced teaching/learning results.

Research literature (Graham, Woodfield and Harrison. 2013; Neyland, 2011) suggests some support types used in technology enhanced teaching/learning:

• Administrative – organisational support, which is meant for learner administration in virtual medium. This support is most often provided by a virtual learning environment administrator. Such measures as a calendar, user administration tools, learning/study agreements are used for support.

• Methodological support, which is meant to help learners during teaching/learning organisation, for instance, select appropriate teaching/learning curriculum in time, the assigned task, assessment measures, and etc. This

support is provided by the teacher using the following measures: student progress observation measures, study/learning guides, synchronous and asynchronous communication tools.

• Pedagogical support, which is meant to identify the learner's level of perception helping him/her to observe their own teaching/learning progress and properly prepare for the assessment process. Metacognitive measures are most often used for this purpose and also individual communication measures in virtual learning environment.

• Technological support, which is meant to help learners to solve various technological problems, to ensure the accessibility to technology enhanced teaching/learning curriculum. This support is provided by virtual learning environment administrator.
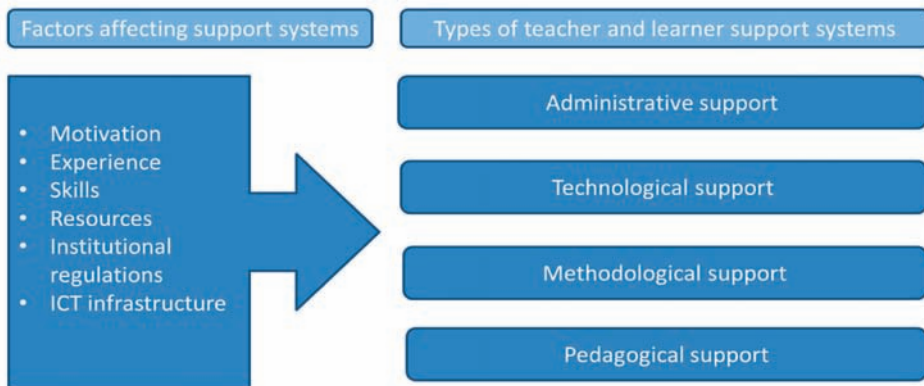
Figure 14. Factors affecting teacher and learner support system types.

Using virtual teaching/learning environment, support measures provided to learners have to be decided upon during TEL curriculum designing. Curriculum authors plan, whereas teachers use technological tools integrated in virtual teaching/learning.

During technology enhanced teaching/learning, the main support sources are material presented in the subject environment, interaction with the teacher and interaction with other learners. Another source of support provision is support structures, i.e. which determine time and location when and where the

teacher can counsel students who have questions, and students have a possibility to learn about the assessment of the performed tasks and receive feedback.

Transferring curriculum from traditional studies to online studies requires a lot of teacher efforts – they are encouraged to organise various teaching/learning activities in virtual environment, create situations training student metacognitive skills. As stated by Anderson and Dron 2012), if teachers intend to achieve good teaching/learning results and meet individual learner needs, they have to design tasks which enhance active learning (for instance, text reading tasks, information search in literature sources, reflection about the learning process, application of new acquired knowledge in teaching/learning tasks). This kind of support can be called methodological support. Learning should be organised so that learners perceive the importance of learning and acquire skills to gain knowledge from the found teaching/learning resources themselves. It is also very important in technology enhanced teaching/learning for teachers themselves to be able to develop teaching/learning organisation scenarios, harmonise several teaching/learning organisation methods and present as well as maintain the chosen teaching/learning organisation scenario till the end of the process.

When traditional face-to-face learning is introduced with elements of distance learning, it is called blended or hybrid learning. However, although Ocak (2011) found that online teachers define blended learning "as a way of utilizing web-based resources to replace face-to-face activities and to reduce the in-class time" (p. 693), the proportion of distance and face-to-face learning in blended learning, despite many authors interested in the topic (e. g., Cockbain, Blyth, Bovill, Morss, 2008; Lopez-Perez, Perez-Lopez, Rodriguez-Ariza, 2011; Olapiriyakul, Scher, 2006; Graham, Woodfield, Harrison, 2012), still seems to be unclear. Technology ranging from distance to traditional learning is used by the majority of teachers and it requires much support, such as development of particular teacher and learner competencies, new learning and teaching approaches and styles, ways for interacting meaningfully, appropriate infrastructure and various cost-sensitive software and skills to use it to fully exploit the technological advances. The technological dimension of every community is its capital, its tools and skills, and ways of dealing with the physical environment.

Technology enhanced learning (TEL) is used extensively throughout the educational world and is usually 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 are willing to change and are ready to introduce organisational models and structural changes, they grasp the opportunities that TEL provides. On the other hand, TEL application to educational institutions' needs changes traditional teaching and learning paradigm and the role of teachers and learners, highlights the necessity of support for teachers and learners by introducing proper policies of organisation and management decisions supporting TEL, in-service training of teachers, creats online learning communities, strengthens students' guidance and provides appropriate technological and informational support. Neyland (2011) mentioned a range of technology adoption models and support by institutional administration of pedagogical innovations, students learning.

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. At 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 even more challenges than learning new software programmes. According to Olapiriyakul and Scher (2006), an online course requires more time for preparation than a traditional one. Researchers also add that the usage of web-based technology requires more finances and deeper knowledge of technology. Kyei-Blankson (2010) agrees with Olapiriyakul and Scher (2006) and states that not only time, finances and knowledge are 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).

Woo & Reeves (2007) claim that instructional designers lack theoretical knowledge about interaction. Rovai (2002), Thompson & MacDonald (2005), Shea (2006) explain the role of community that supports online learning in

relation to three elements: social presence, teaching presence, and cognitive presence. Social presence is understood as the degree to which learners feel socially and emotionally connected with others in the virtual environment; cognitive presence means the ability of learners to construct and confirm meaning through sustained discourse and reflection; teaching presence means the design, facilitation, and most importantly, the direction of cognitive and social processes in order to achieve learning outcomes.

Woo & Reeves (2007) argue that not every interaction is meaningful; however, it is one of the key components of good pedagogy, independent of whether the technology is used or not. They claim that "interaction is … fundamental process for knowledge acquisition and the development of both cognitive and physical skills" (p. 15) and should be used for learner's support, but only when it is re-conceptualised in terms of learning theories. The authors claim that interaction is meaningful when it has a direct influence on learners' intellectual growth.

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 to Olapiriyakul and Scher (2006) and Kyei-Blankson (2010), support is necessary for both teachers and students (Fig. 14). While integrating TEL in an educational institution teachers will need organisational and pedagogical support; peer support, information and guidance are compulsory for learners; and both teachers and learners will need some kind of technological support and recourses.

5.1. Technological support

The wider the possible range of modern technologies is offered for teachers and learners to use in the learning process, the more effective learning outcomes may be expected. 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) summarise 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 and 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 dedicated 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 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 effective learning results. 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 behaviour. This can lead to a more efficient and effective learning when the relevant data about a user's behaviour is brought together in a meaningful way, combined and implemented in instructional strategies and indicated in an intuitive, meaningful, and stimulating way. Smart objects support physical activity and manipulation to the forefront of learning; they reduce non-content related tasks and enable learners to concentrate cognitive resources and understanding on the educational content of the learning task. Such learning could be defined as cognitive conscious learning enhanced by technologies.

5.2. Pedagogical-methodological support

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. Technology integration in teaching process may be operationalised from the teacher's perspective to include the extent to which the use of technology fits into the overall unit of instruction whether there are transitions before and after the activity with the rest of instruction and the extent to which technology use is not a separate activity from other instructional activities (Baylor, Ritchie, 2002).

It is important for the technology-enhanced teaching that instructors fully understood the process of such teaching and the structure of the changed learning environment, were aware of how to build relationships with students and ways of supporting them in their self-regulated learning (Olapiriyakul, Scher, 2006). The changing role of the 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 the 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 the traditional teaching when only the study content is presented hoping for a passive student to sit, listen and memorise for the exams. Teachers have to become more tolerant, knowledgeable about various contexts and etc. in order to encourage all the students to 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 the authors mentioned earlier, a teacher has to find new ways to encourage students to 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.

5.3. Administrative-organisational 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). Educational institution policy must support the integration of TEL; only then teachers will be able to develop their competencies of employing technologies in their lessons and will feel satisfied with the teaching process.

Olapiriyakul and Scher (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 organisation 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 showed that teachers can even bear 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.

5.4. Learner support system

Earlier, when there was no technology used in education, students would mostly go to institutions in their city or their country. However, nowadays technologies enable students to choose an online course in any part of the world and this increases the competition between the institutions. Therefore,

from this perspective the student-centred approach is becoming inevitable, students are the customers, their expectations must be fulfilled and they have to be satisfied with a course in order to consider the studies valuable. Not only the satisfaction of students has to be ensured, but, as Motteram and Forrester (2005) emphasise, an understanding of students' needs is essential. Jacklin and Riche (2009) conducted a qualitative study to find out what a support means for students. Their findings show three main dimensions of support for students: 1) human and material resources; 2) information, advice and guidance; and 3) perceiving that a student is not alone and has an ability to succeed. The following are the examples of how this can be achieved.

Technology on its own can hardly make more superior learning happen, but it did change the way teachers are teaching and learners are learning. Active teaching and active learning are relatively new concepts as the young is a generation that grew up with, for example, computers, internet, social media. These young people have learnt to use the advantages of technology, and their ways of perceiving the world have changed and so their way of learning has to be changed. Students have become more independent as they have any information available whenever they have internet connection at hand, and they need to learn less specific materials from lecturers or textbooks the and to learn more how to organise the information available, how to analyse it and how to use it effectively. These students are faced with complex problems and the uncertainty they cause and, therefore, lecturer's role, in contrary to the traditional knowledge conveyor, changes to the one of instructor, coach, and facilitator. The facilitator has to teach students the course material as well as soft skills, such as time management, self-regulation and creativity, and this also changes the methods employed in teaching. Instead of a teacher making presentations, she/he is advised to promote team-working, learning communities and discussions more than ever. One of the recommendations derived from Beck's (2008) survey is for teachers to stimulate both kinds of student's knowledge – content and metacognition. According to the author, this can be achieved, for example, by complementing presentations with project work. As for the teachers, they should also have frequent interactions with peers to share the information on how to make an online course effective.

To ensure student support, a change team in the United Kingdom (UK) Open University was assembled to innovate and improve student's support (Stevens, Kelly, 2012). The team "established a long-term programme of investigation, action and evaluation, which has instigated a significant shift in the university's approach to student support. It had the momentum to make a genuine impact on the student experience and university practice and policy" (p. 146). Although not every institution may devote so many resources to develop a change team, the authors provide with the main changes that any institution should strive for. For example, identify the needs and objectives of the students as well as their previous experience in learning in general and learning in technology-enhanced courses. Furthermore, the authors advise to identify the strong and weak sides of the student that may influence the learning process.

Paechter, Maier, and Macher (2010) investigated students' expectations and experiences with an e-learning course. Their analysis of 2196 students from 29 universities in Austria showed two aspects that most strongly contribute to students' achievements in an online course and satisfaction with it. These factors are students' achievement goals and the role of an instructor. Students that valued gaining particular competencies instead of just learning the course content achieved more. Students also valued the teacher who played the role of a counsellor and facilitator. Singer and Stoicescu (2011) concluded their study by formulating suggestions for improving the blended-learning process. One of the ways is to create and consistently moderate online forum for students' discussions as this was practically showed to deepen their understanding. It also proves the student-centred approach to learning, as lecturers can readjust the course material in a way that would make students understand and learn better.

Dennis, Phinney and Chuateco (2005) point out that peer support for students is necessary for better learning outcomes and proves it to be the most helpful strategy for dealing with academic problems. Therefore, the student-centred approach is becoming inevitable: learners are customers, their expectations must be fulfilled and they have to be satisfied with the 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 the course. Research carried out by Jacklin 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 the disabled students and social networks, etc.

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

Growing population means more diverse population. People, who otherwise could not study in the particular place or institution due to various issues, now have an opportunity to join these learning communities, and this makes these communities more diverse. This is an issue for lecturers, as they have to become more tolerant, knowledgeable about various contexts and etc. in order to make all the students learn independently of their differing qualities, identities, learning styles and etc. In general, the role of support is to make the course effective, i. e., to make students learn, and make teachers and students be satisfied with the experience of learning enhanced by technology. Therefore, systems of support for students as well as teachers have to be established. Following that, the United States (US) National Education Association states that professional development should be oriented towards professionalisation of lecturers in using TEL. The following areas also emphasise the importance of support systems in order to help lecturers to organise and implement online courses (NEA, 2006): appropriate communication, appropriate and timely feedback, facilitated discussions, team-work and multimedia projects, adaptation of curriculum, materials and online tools to support effective instruction (NEA, 2006, p. 11).

What is more, an important part of the learning process, as Cockbain *et al.* (2008) propose, is a learning community for students, where they have an opportunity to interact with each other as well as with teachers which increases their commitment that accordingly promotes their critical inquiry. Learning communities also have an advantage of enhancing students' motivations to learn together with knowledge and aptitude (Terzi, Celik, 2005). Moreover, due to the changed learning environment when a more independent learning is required, as Olapiriyakul and Scher (2006) summarise, students can be

motivated through more frequent direction as well as encouragement from lecturers. From the students' perceptions, as observed by Norton and Hathaway (2008), students need an effective instruction, illustrative examples, course facilitation, value, effective communication and a feeling that teachers are concerned with their learning. The learning environment, according to these authors, must be suitable to enhance students' time management skills, be suitable for pacing their own work and provide a sense of ability to succeed.

Beside the experiences with a course material and the way it is provided, and important aspect in choosing an online course, from a student's perspective, is its cost. The College of Computing Sciences at New Jersey Institute of Technology (NJIT) (Olapiriyakul, Scher, 2006), for example, recommends their lecturers to use a freeware or shareware programmes in order to reduce the online course costs, especially when existing software is as functional as a commercial one. It is an advantage for both institution and students, as it lowers the course price considerably. To help students use such programmes, it is recommended to provide manuals and guidelines on how to employ the technology effectively (Chen, Lambert, Guidry, 2010; Olapiriyakul, Scher, 2006). The authors also suggest teachers or university administration to complete an investigation on student learning styles prior to any course, because it would help to plan the course effectively.

Bentley, Shegunshi and Scannell (2009) conducted two surveys in order to understand learning support mechanisms in the UK University's overseas MBA (Master of Business Administration) program. Their goal was to find out the impact of such systems on learner's experience. They grouped the main needs proposed by students, and they found out that students need "consistent and comprehensive module information and guidance, clear assignment instructions and the formats of examinations" (p. 57). Furthermore, although students valued flexibility of their time management and flexible learning enabled by an online course, some felt the need for more face-to-face interactions. The value of face-to-face interactions was also shown by Panagiotis and Chrysoula (2010). Students also felt the drawbacks of the software for submissions due to a lack of immediate confirmation for their assignment submission as well as delay in feedback that lies outside the specified feedback date. Similarly, students felt another kind of software was not properly utilised and proved not to be useful, while also having technical

malfunctioning in most of the lectures. Finally, students noted a lack of technology in the classrooms or pointed out its malfunctioning.

It can be stated as a conclusion that interaction and support are critical elements in TEL service design and provision. Designing effective presenting modes of teaching, planning and implementing interaction with students to monitor their learning progress and to handle interactivity and support with technological tools are success factors for efficient and effective support in TEL.

Taking into consideration all resources previously mentioned in this chapter, there are clearly human and non-human types of resources indicated in research literature, which can be classified as follows (see Fig. 15):
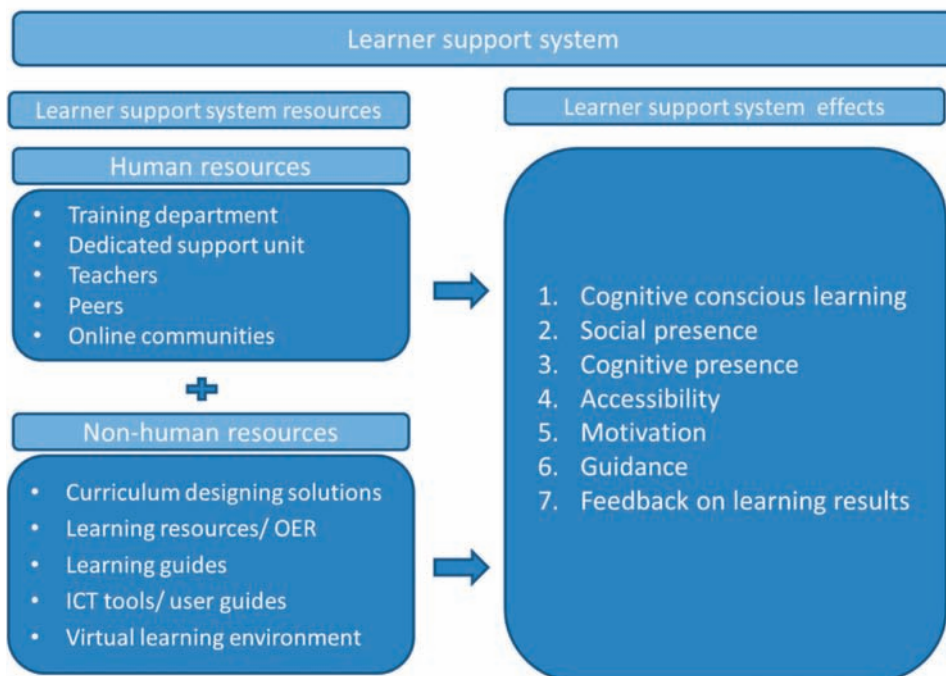

Figure 15. Learner support system

Training department and dedicated support units or departments in organisations provide administrative and methodological support for learners, while teachers and peers in the learning process provide pedagogical and sometimes technological support. Technological support for TEL is mainly

provided by dedicated technological units in an organisation and existing ICT infrastructures. Curriculum designing solutions also have great influence upon learning support, as well as accessibility and guidance on the use of OER in TEL. Learning guides, ICT tools and their user guides are direct non-human resources (in fact, produced by humans, by all means) and are directly accessible and frequently used resources available for the first help during TEL. Virtual learning environment structure, design and user-available settings are also important support system elements.

All these types of learner support system resources create added value to TEL and create facilitation settings for learners by improving cognitive conscious learning, social and cognitive presence, accessibility to TEL, increasing motivation and guidance, as well as facilitating feedback provision on learning results.

5.5. Teacher support system

De la Varre, Keane and Irvin (2010) describe a good practice of having two teachers for a blended course. One is an online instructor responsible for interactions with students primarily through asynchronous technology use, such as discussion forums, who establishes a timetable and schedule for assignments and guides student through the curriculum content. The second teacher provides local face-to-face support for students, and teaches them the soft skills, such as time management and self-regulation skills, required for effective problem-based learning, as well as answers the questions at hand. Especially promising is that "the teachers shared the duties of a blended course based on their learner-centeredness, professional training, assignment to the intervention or control group, their perception of the facilitator role, and the needs and characteristics of their students" (p. 42).

The future of digital culture-yours, mine, and ours-depends on how well we learn to use the media that have infiltrated, amplified, distracted, enriched, and complicated our lives (H. Rheingold, 2012). Educators are the persons who need to use technologies in their daily teaching activities. If it is acknowledged that one central goal in present-day education is to transform technology-mediated practices from acquisition and participation type approaches towards

systematic knowledge creation practices, then the desired transformations have to be explicated in more concrete terms (Lakkala *et al.*, 2009). This chapter presents a theoretical overview of the creation of new participatory technologies for collaborative knowledge, used in TEL, and raises discussion questions – which technology is appropriate in a particular situation.

As it was mentioned before, in order to retain the competitive advantage, academic institutions must be student-centred. Similarly, to retain the best teachers and develop their competencies, organisation must strive for teacher's satisfaction as well. A study by Wasilik and Bolliger (2009) indicates that there are certain ways that administrators can employ to increase teacher's satisfaction in the virtual environment. One of them is to provide the faculty with certain level of interactions with students online or face-to-face, as it is highly valued by teachers. As the study showed, teachers can even bear an increased workload if it adds to the amount and quality of interaction. 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.

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 an experience in teaching an online course. Therefore, higher education institutions should consider how teachers would be able to practice online teaching more often. This refers to on-the-job training as well as professional training before the start of an online course (Lowrie, Jorgensen, 2012). Paechter, Maier and Macher (2010) also observed the training of the lecturer as a very essential aspect contributing to students' satisfaction to the course.

Technology has obviously proved to be useful in education and many technologies and software are being designed and improved. It enables distance education, accessibility, cost-effectiveness and enhanced information use. However, there are various technologies and software that create a problem in choosing which ones are the best fit for a particular course. While teachers, as it was pointed out, already have an increased workload, it could be an administration's work to find and implement the best of them. In order to choose the software or technologies that would make the best fir for an online

course, university should have a clear vision, strategies, goals and reasons for the distance and blended courses. Moreover, it is not enough to have all these institutional guidelines, as they have to be shared with teachers, understood fully and adopted.

As technology creates certain challenges for their users, teachers as well as students should have clear manuals and guidance on how to use the technologies and software adopted by the institution. Ideally, the technology is used not because it is innovative and trendy at the moment or, even worse, just because it exists and is used by competitors, but it is used fully understanding that it complements and enhances learning.

Education institutions can and should also provide teachers with rules and guidelines on how to prepare an effective online learning or blended learning course while giving them full responsibility for course development (Olapiriyakul, Scher, 2006).

Similarly as regarding the students, Cockbain, Blyth, Bovill and Morss (2008) suggest creating learning communities that would foster discussions and peer support as one of the ways to support lecturers in technology-enhanced active teaching, which is quite a new experience for most of them. What is more, a study (Graham, Woodfield, Harrison, 2012) found that academic institutions can support their teachers with establishing and sharing the purpose of technology-enhanced learning implementation, as well as a offering them a clear definition of blended learning. The authors also found value in an administrative blended learning advocate that would convince teachers of a need for blended learning while involving teachers in decision making about how and what impact blended learning would have on them.

To integrate TEL into organisations, it is necessary to ensure administrative, organisational and – especially – technological support for teachers. Teacher support system should be created using teacher support system resources which can be classified into human and non-human resources. Human resources would include support provided by training department and dedicated support units in certain organisations, which would mainly provide administrative and organisational support, as well as technological support. Peers and online communities would be excellent human resources for teacher

support in order to share best practice examples, to peer review practices and TEL curriculum, to share resources and work for quality improvement of TEL services.
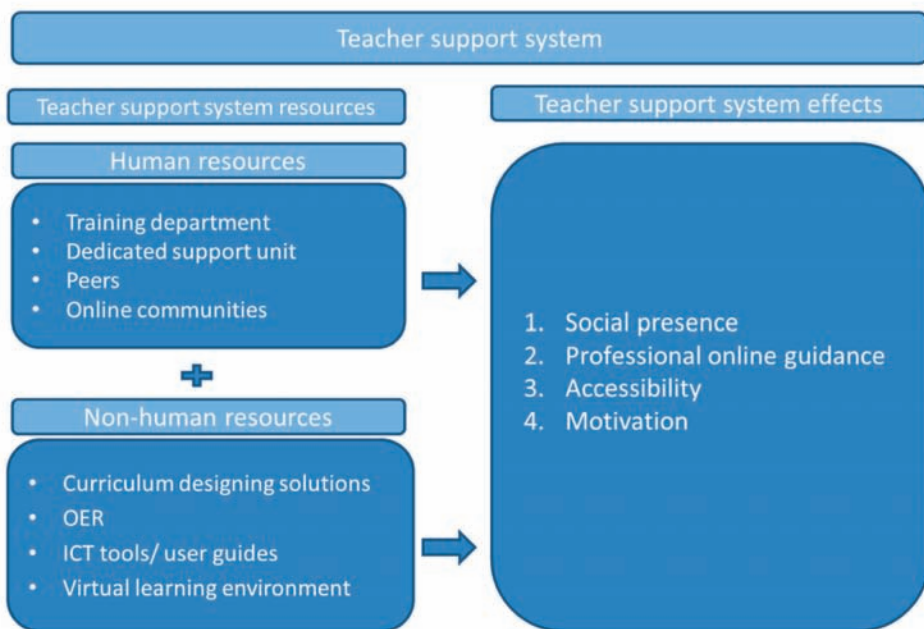
Figure 16. Teacher support system

Non-human teacher support system resources usually include curriculum designing solutions, the use, re-use, and adaptation of OER, available ICT tools and their user guides, as well as virtual learning environment solutions implemented at the level of the organisation. When information guidance and technological support are implemented, the use of technologies will lead to more efficient, acceptable, better processed and effective learning.

When teacher support system is established with the use of the resources mentioned above, teacher performance in TEL will be improved via more efficient teacher's social presence in TEL, more professional online guidance for TEL participants, as well as accessibility to TEL and teacher motivation for qualitative TEL designing and implementation.

To summarise and to conclude, in order to design a TEL curriculum and to implement TEL organisation, preparedness of TEL participants in terms of technological skills is very important. A support system should be established within an organisation to minimise the effect of external factors on successful TEL organisation. The support system should positively affect the development of social, psychological, cultural and philosophical climate of the learning participants. Support systems create an added value to the teaching and learning process by improving cognitive conscious learning, social and cognitive presence, accessibility, motivation, guidance and feedback on learning results.

There are two support systems needed, one for teachers and one for learners. Both systems should include administrative-organisational, pedagogical-methodological and technological support types, such as user and curriculum administration, immediate technological and didactical help accessibility, peer support, investigation of needs and expectations, online social presence in virtual learning environments, handbooks and ICT tool kits, as well as consultation and direction on building online communities and peer help.

Support for TEL participants is usually available in organisations from a dedicated unit (also indicated as a still rare case by some organisations). Support is provided in different forms, namely, in the form of a multi-device cloud computing environment, via various forms and using multiple devices/operating systems, in the form of templates (used most frequently), feedback tools and tutorials.

To conclude, the support system for TEL participants should include facilitation and solutions to administrative, didactical and technological issues. A well-designed support system for teachers and learners has the following features: facilitated information search options, technology handbooks and integration kits, TEL users and courses administration options, accessibility options of different TEL curriculum forms and devices, frequently asked questions and complaints' options, immediate accessibility to pedagogical and technological help, peer support, learning accessibility in different forms, investigation of learners' needs and expectations, building online communities of learners, and social presence in virtual learning environment.

6. Quality assurance procedures

Only a few years ago, TEL was off the senior management's agenda; however, after MOOC (Massive online open courses) and opening up education initiative, there is hardly an organisation existing which is offering education or training services without TEL.

Quality assurance procedures, on the other hand, do not seem to be enforced with the same rigor. Organisations seem to not always be aware of the correct procedures to be applied due to very rapid development of the services themselves. For example, TEL curriculum quality criteria would differ from virtual mobility curriculum (which is considered to be a part of TEL) quality criteria.

On the other hand, unwillingness to develop procedures that are able to manage this risk appropriately is very risky in itself. Consequently, these innovations are seen as inherently risky, and are treated as special cases and are simply excluded from oversight. Mellar & Jar (2009) suggest that "higher education institutions need to re-examine the way that they approach the quality assurance and enhancement of e-learning courses" (p. 30). Institutions need to develop approaches to the quality management of innovation (and especially innovation involving technology) that support innovation rather than stifle or sideline it.

Quality assurance should be embedded in the operation of the organisation. First, the organisation should have a long-term vision and its implementation strategy. The implementation strategy should maintain promotion tools, implementation resources attributed to each implementation step, and also should have the place to indicate the factors affecting the implementation strategy. TEL quality assurance is specific in terms of cooperation, interaction among different stakeholders on international level and openness of TEL integration in an organisation. Online platforms and technological infrastructure create pre-conditions for opening up staff professional skills, TEL curriculum, student and teacher support system, business and marketing strategy (opening up and implementation), and other important components of TEL integration.

Bacsich (2009) reviews benchmarking methodologies used in the United Kingdom universities, and references parallel work in New Zealand, Australia,

Sweden and European Union (EU) based organisations. Typically these methodologies specify sets of criteria which are scored by evaluators. They differ mainly in the set of criteria and the ways in which the scores are arrived at. They are all outcome-based, and do not prescribe how a project should be set up or e-learning materials developed.

Ferreira & Andrade (2011) discuss the "E-learning quality – ELQ" model developed by the Swedish National Agency for Higher Education. The model was identified through the analysis of: i) policies, projects and working networks developed by several European organisations, ii) policies of governmental agencies and national organisations dedicated to quality assurance in higher education, especially in e-learning, iii) published scientific articles. The model consists of ten dimensions: 1. material/content, 2. structure/virtual environment, 3. communication, cooperation and interactivity, 4. student assessment, 5. flexibility and adaptability, 6. support: student and staff, 7. staff qualifications and experience, 8. vision and institutional leadership, 9. resource allocation, and 10. holistic and process aspect.

The Australasian Council on Open, Distance and e-learning (2014) set eight benchmarks to support continuous quality improvement in TEL. The approach reflects an enterprise perspective, integrating the key issue of pedagogy, with institutional dimensions such as planning, staff and student development, and infrastructure provision. The benchmarks have been developed for the use in the organisational level. The benchmarks cover the following eight topic areas: 1. Institution-wide policy and governance for TEL; 2. Planning for institution-wide quality improvement of TEL; 3. Information technology systems, services and support for TEL; 4. The application of TEL services; 5. Staff professional development for the effective use of TEL; 6. Staff support for the use of TEL; 7. Student training for the effective use of TEL; and 8. Student support for the use of TEL.

Recent developments of higher education introduced the need of benchmarking of TEL services. Benchmarking allows an organisation to be compared with another TEL service provider with the purpose to observe and compare their operation and services. However, as we can follow the latest developments, benchmarking produced both, positive and negative effects in terms of interpretation of the results. It became a common practice to spread

opinion based on segmented analysis rather than on a complete picture of assessment results. Nonetheless, developments in TEL service provision advance so fast, that stakeholders and service forms change very rapidly, affecting quality assessment criteria. Benchmarking results might suggest a picture of the nearest future which is not actually important at a given moment, as we talk about the result of TEL services.

On the other hand, some constituents of the TEL service which are the components of the holistic picture might be exaggerated by customers or underestimated by TEL provider institution, but might have high importance for a specific target group of TEL services. Differentiation of target groups in higher education plays an important role in shifting the paradigm of TEL quality assurance future models. TEL providers should consider all quality assurance models (economic, technological, pedagogical, managerial and others), but the quality assurance system should be unique and consistently introduced within the organisation for its unique TEL provision.

Sceptics continue to question the quality of electronically delivered educational programmes. It is not always clear how the participants who get education through online courses can be farely compared to those who receive face-to-face course content in formal settings (Ogunsola, 2010). Mulwa, Lawless, O'Keeffe, Sharp and Wade (2012) state that the reasons for evaluating learning provisions might be as follows: (a) to determine whether the TEL solution accomplishes its objectives; (b) to identify who benefited most or least from the TEL programme and (c) to identify areas for improvement. Evaluations provide valuable feedback about potential users' perceptions of the TEL system, how well the software is written and the extent to which the system really supports decision making (Jiang and Klein, 1999).

Researchers (Rubio, 2003, and others) suggested return on investment (ROI) models to assess the impact of TEL integration into an organisation. These included TEL curriculum design, implementation and evaluation costs. However, the authors agreed that evaluation and management of the quality, as the aim of systematic and continuous improvement, are fundamental. To reach this aim, effective, efficient and operational continuity should be ensured in TEL integration. ISO (International Organisation for Standardization) and Total Quality Management evaluation models are also based on these principles and

suggest to: a) define the plans and goals, b) document processes and results, c) assess satisfaction in terms of expectations, d) ensure prevention of errors and establish corrective actions. Following researchers and quality standards, these principles should be introduced in all phases of TEL integration into an organisation.

Quality assurance model applied in an organisation must be consistent with *the strategy and the policy of the organisation*, and should measure implementation of this strategy and its specific means. TEL quality assurance should be implemented with all stakeholders and through all areas of TEL integration in the organisation.

The aims of quality assurance should be well established and communicated among academic community within the organisation. Benchmarking – aiming at identification of best practices and contextualisation – should be introduced and perceived as a tool not only for quality assurance, but also for visibility and competitiveness of the organisation in the area of TEL.

TEL environment is another object of quality assurance. As Ferreira and Andrade (2010) indicate, several evaluation models have been proposed to cover different dimensions of *TEL environments*, ranging from organisational and systemic point of view, to proposing micro-view evaluation criteria with respect to TEL environment elements (content, assessment and tutoring functions, and other). The authors propose to implement the analysis of the existing quality assurance models embedding them into the e-learning quality assurance model (ELQ) developed by the Swedish National Agency for Higher Education, considering the ten dimensions already mentioned, i.e. material/ content, structure/ virtual environment, communication, cooperation and interactivity, student assessment, flexibility and adaptability, support for students and staff, staff qualifications and experience, vision and institutional leadership, resources allocation and the holistic process aspect.

ELQ model suggests that *ICT infrastructure* is affected by characteristics of learning, active or passive learning methods, and other factors. TEL infrastructure should be harmonised with the hardware used, learner and teacher support available, synchronous and asynchronous learning and teaching interaction, and other parameters. Different models of technological platforms were already analysed by Rubio (2003) who categorised analysis

results into the costs of the platform, hardware and software requirements, characteristics of development capacity, tools available for students and teachers, and for administrators.

Besides other important features of *TEL curriculum* usually described in a set of quality assurance handbooks and indicated in quality assurance tools, TEL curriculum is qualitative when it is realised with ICT tools at virtual learning environment, which allows teachers to implement learner control, supervise learning activity implementation, and reach academic goals. TEL curriculum added value should be ensured with the possibilities of collaborative learning and knowledge accessibility via social networks. These factors affect TEL curriculum quality and increase TEL motivation.

Planning TEL curriculum integration into an organisation, essential issues need to be addressed, i.e. who will be designing the TEL curriculum, who will be peer reviewing the curriculum ensuring its quality, what methodology will be used to assess the quality of the TEL curriculum.

Another important question is who owns the TEL curriculum after it is designed, as well as who administers and ensures data security and open education requirements in the organisation after learning sessions. All stakeholders should be considered while defining the regulation for TEL curriculum designing, implementation and archiving.

Mallinson and Krull (2013) highlight the need and the aim of higher education institutions to build *academic staff capacity* to support and engage learners to ensure quality learning and teaching. The authors also agree that engaging learners, and using information and communication technologies access to higher education and ensure its growth. Staff members in an organisation usually express their individual preferences for professional development. However, for successful TEL integration, *continuing professional staff development* and the level of required qualifications should be supported by the organisation in terms of TEL curriculum designing, learning organisation, learner support and interaction/communication, as well as in assessment strategy development and implementation in TEL curriculum.

Tait (2014) argues that the educational mission rather than the mode of delivery is the more powerful explanatory driver of higher education. The researcher states that *student support* (as one of the recognised quality

assurance criteria in the study programme evaluation) should now be understood as integrated with teacher and assessment, not separately organised structurally and professionally. Support systems established in an organisation should ensure a smooth support provision for learner and teacher interaction and collaboration, active and passive learning, and user administration within ICT systems used, digital skill development in terms of academic and social exchange, cost-free internet connection, and solution to technical problems.

Mulwa, Lawless, O'Keeffe, Sharp and Wade (2012) summarised scientific literature (Ehelers *et al.*, 2005; Drachsler *et al.*, 2010; Breitner, Hoppe, 2005; De Jong, Schellen, 1997; Nielsen, 1993; all cited in Mulwa *et al.*, 2012) and proposed summarised quality assurance approaches for TEL services, including quality assurance based on a survey approach, lifecycle approach placing evaluation at the centre of the development process, combined and layered evaluation approach used to measure the impact of TEL recommendations, pedagogical objectives' approach, user-centred evaluation approach, empirical approach, utility approach where ICT solutions are implemented for internal quality assurance level (surveys, communication, etc.).

Quality assurance in TEL is discussed in contemporary research from a number of perspectives. Friesen (2009) distinguishes the potential of open educational resources as the key factor of change and sustainability of higher education. The researcher claims that open educational resources improve student recruitment and marketing, foster significant changes in practices and higher education culture. Schmidt, Geith, Haklev and Thierstein (2009) argue for the fundamental importance of the development of accreditation via recognition of assessment implemented by peer-to-peer review and recognition of learning. However, all the authors mentioned (and many more) argue for opening up education with the purpose to assess and recognise learning, increase access and enable global participation (Morgan, Carey, 2009), and to bridge educational digital divide among various social groups (Lane, 2009). Mahieu and Wolming (2013) also agree that flexibility that web-based learning opportunities provide is far more advantageous for many adult learners and is a very important factor in choosing the education provider for mature studies.

To summarise and to conclude, quality assurance procedures should be updated to TEL requirements depending on the scenario of TEL that the organisation implements and they should be embedded into organisation operation through all integration criteria groups. Quality indicators should be present in strategy implementation monitoring, for technological infrastructure, for peer reviewing of TEL curriculum, continuing professional staff development, for support systems and for business and marketing strategy.

Benchmarking policy might be targeted for an organisation for TEL service provision, for the purpose of quality assurance, but also for the ability of an organisation to be compared with other organisations in terms of the quality of TEL services. However, TEL services in the organisation might be also of a unique character and might be attributed for other types of quality assurance strategies and procedures.

Quality assurance models are under discussion in research literature. Available examples suggest sets of benchmarks to support quality improvement for TEL and e-learning services. The uptake of quality assurance procedures for TEL services by senior management is identified as problematic in practices. Introduction of TEL service is not fine-tuned yet nor treated adequately as integration of innovation in an organisation. It may be summarised that TEL services need quality assurance procedures to give credibility for innovative service quality assurance, as well as leave no doubt that innovative methods meet and, more important, highlight and reveal all quality aspects of TEL curriculum and programmes.

7. Marketing and business

Ongoing market research on e-learners (clients) by Lawless, O'Keeffe, Sharp, Wade can provide institutions with comparative advantage over others in their e-learning offerings. Market researchers and recruiters (sales persons) should be part of the overall e-learning initiative. The scope of this marketing operation may depend on institutions' e-learning policies and types of their clients (learners). One of the important marketing strategies is

to make accurate and updated information about their e-learning offerings known to as many potential learners as possible. This can be accomplished by registering e-learning sites with search engines, banner advertising, postings and list servers, endorsement by credible people and institutions, and so on. Effective marketing will help institutions to attract and recruit students for their courses and programmes (Khan, 2005).

Martin & Matlay (2003) discuss that organisation could gain considerable competitive advantage from internet usage, if they can achieve the right mix of managerial capacity and marketing focus in terms of image, brand and customer needs. Their human resource base could allow such organisations to "reinvent" themselves, mainly by effectively accessing and embedding new knowledge. It emerged that organisational culture facilitates and supports a wider access and application of new knowledge through organisational learning mechanisms.

Law & Ngai (2008) state that improvements of the business process, product and service offerings are positively associated and, in turn, are positively related to organisational performance. The findings reinforce the importance of knowledge sharing and learning in companies. Executives should encourage knowledge management and organisational learning activities within their firms, and give proper considerations to the strategies and implementation of programmes supporting these activities in order to enhance the firm's performance. Improved and increased accessibility reveals new managerial capacities and possibilities to share and market TEL services. Marketing strategies should be developed on strategic and managerial level to foster TEL service provision and new organisational learning modes.

Organisations that are most successful in providing new services keep their service development process from the beginning and move systematically through a set of planned stages from the establishment of clear objectives, to idea generation, concept development, service design, service launch and customer feedback. Service design requires understanding of the service outcome and customer process, the way the customer experience unfolds over time through interactions at many different touch-points (Bitner, Ostrom, Morgan, 2007). Designing of services, particularly in early stages, requires a

marketing strategy, and is often characterised by a low level of formalisation. It is also important to have in mind that organisations are competing strategically through service quality for greater differentiation in today's competitive marketplace. Moreover, successful companies focus on the services-dominant paradigm with investment in people, technology, and human resource policies. In that sense TEL integration reinforces marketing. Many consumers and business professionals seek information and connect with other people and businesses from their computers and phones. With access to many sources of information and interest in interactive media, consumers may collect more product information on their own. Work environments are also changing with more people having virtual offices, texting on their cell phones, or communicating through social media sites such as Facebook, LinkedIn and Twitter. As the media landscape changes, the money that organisations spend on different types of communication will change as well. Recently responsive design has become a priority for businesses, as mobile traffic continued to steadily increase with the introduction of larger screened devices such as tablets or smartphones. However, it is predicted to move beyond in the future just having a responsive site or mobile app, and focus on mobile-optimised content and social media marketing. Executives should encourage knowledge management and organisational learning activities using a variety of devices within their organisations, and give proper considerations to the strategies and implementation of programmes supporting these activities in order to enhance the firm's performance.

Communication plays an increasingly important and changing role in modern organisations, providing the interface for communicating values between the corporation and its myriad of diverse stakeholders (Schults & Kitchen, 2004). Traditional model of communication is based upon a formal transmission framework, whereby the sender's message is encoded, transmitted via a conduit and then decoded by the receiver; however, Chernatony, Cottam and Segal-Horn (2006) indicate three types of communication – management, marketing and organisational. Management communication refers to messages conveyed by management for internal and external stakeholders; marketing communications are those aimed towards consumers, e.g., advertising, direct mail, sponsorship or contact with employees of the organisation; organisational

communication covers all other types of communication, such us internal communication, public affairs, environmental communication.

Research in services has long recognised a need for managers to focus on employees as well as externally on customers. Lings (2004) discusses a triad of marketing relationships their services managers should focus their attention on: 1) The relationship between the customer and the company (external marketing); 2) The relationship between the customer and the employees (interactive marketing) and 3) The relationship between the organisation and employees (internal marketing).

Rafiq and Ahmed (2000) discuss internal marketing from managerial positions and suggest three major phases, namely, an employee motivation and satisfaction phase, a customer orientation phase, and a strategy implementation/change management phase. Managers need to find appropriate communication mechanisms for their particular organisations and the task in hand. Managers may increase employee's job satisfaction by designing jobs with features that prospective employees value rather than just concentrating on task requirements of the job. This means that involvement in job specifications is needed particularly where contact with customers – students, learners – is involved. Second, providing employees with a right type and level of training to perform their jobs is very important. Appropriate training also means that employees can meet needs of customers effectively. Managers also need to adopt a participative management style and allow a degree of discretion to employees.

Service organisations ought to develop active internal communication in order to understand difficulties associated with serving the company's customers in delivering superior services. Diffusion of decision-making authority, frequent supervisory feedback, training and extra bonuses for those excelling in serving the customers are some of many activities towards this direction. Gounaris (2006) asserts that everything we know about the external application of marketing has a counterpart application internally, and that company's need to develop a strong internal market orientation is prior to successful adoption of external market orientation. Internal market orientation represents the synthesis of beliefs with specific "market-like" behaviours. Internal marketing orientation promotes a need to plan and build effective

relationships between the company employees and management. As a result, company's strategic result becomes more effective in comparison to companies that are only externally focused (Bansal, Mendelson, Sharma, 2001). This allows for a symmetric orientation (see Fig. 17) that maintains a balance between the company's degree of internal and external orientation. Through adaptation of internal marketing strategies, organisations become more effective, and this strengthens their competitive positions in the external market (Ahmed, Rafiq, 2003).
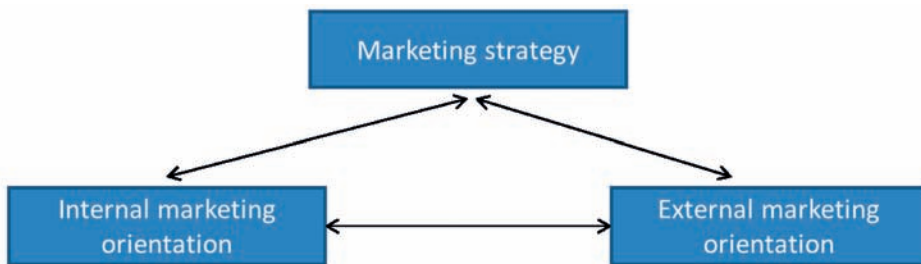

Figure 17. Balance between internal and external marketing orientation

Communication helps businesses grow and prosper, creates relationships, strengthens the effectiveness of organisations, and allows people to learn about one another. Technologies, such as the internet, mobile phones, social media, and customer relationship management systems, greatly affect the way companies communicate with prospective customers. These new forms of communication are changing the media landscape and the type of messaging strategy organisations use.

In a case of educational institution, marketing refers to all activities directed to establishing, developing, and maintaining successful long-term relationships with the students and other stakeholders. The emphasis is on the relationships based on mutual trust and commitment. Building and managing relationships are the underlying facets. It is about transforming students into loyal alumni. According to Grönroos (2000), relationship marketing is not a set of tools, nor is it direct marketing or loyalty programmes. It is a *marketing attitude of mind* throughout the institution, when students feel that the staff is interested in addressing their concerns spontaneously in a friendly and professional manner (Grönroos, 2000). Relationship marketing offers an alternative strategy to build

a competitive advantage based on collaborative involvement with the students and other departments (Sheth and Parvatiyar, 2000). There are three levels of relationship marketing (Berry & Parasuraman, 1991). At level one, price incentives are used to promote enrolments. Social bonding is used in level two to develop trust in the relationship and loyalty to the brand. At level three, the focus is on building structural relationship through customised programmes to meet the needs of the student and the student employer. Level one and two programmes can be replicated by the competition and as such are not appropriate for developing a competitive advantage. Level three programmes are not easily replicable and are the basis of a competitive advantage to the institution, especially in educational services.

Even though there are similarities between marketing of products and services, yet because of the special characteristics of educational services, it is not recommended to blindly apply marketing strategies developed for manufacturing products (Berry & Parasuraman, 1991). .Marketing of educational services is about interactions between the institution and the students that form the basis of the process of relationship building. Management of educational services is the management of these relationship processes. It is more complex than managing products, because products can be standardised, whereas it is difficult to standardise services due to a large number of staff involved with a host of services. Conceptually the complete chain of activities is coordinated and managed as one large process. The goal is to create a non-imitable bundle of services to the student.

Martin & Matlay (2003) discuss that organisation could gain a considerable competitive advantage from the internet usage, if they can achieve the right mix of managerial capacity and marketing focus in terms of image, brand and customer needs. Their human resource base could allow such organisations to "reinvent" themselves, mainly by effectively accessing and embedding new knowledge. It emerged that organisational culture facilitates and supports the wider access and application of new knowledge through organisational learning mechanisms. Companies have to do their best to make utmost use of the latest technologies and developments, such as the internet, so as to maximise organisation's goals. To do this the whole organisation has to be committed, and the implementation has to be a comprehensive one. Furthermore,

companies have to ensure that such a development should be used not only to communicate to the customers, but with the customers benefiting from their feedback (Pullicino, 2002).

Gounaris (2006) argues that despite significant evolution regarding the notion and content of internal marketing, only a limited number of companies implement internal marketing in practice. It may be possible that companies do not employ internal marketing because they lack the underlying culture and internal-market orientation.

There are questions yet to be answered that will likely be addressed in subsequent research by this team and others. For instance, what is the effect of integration of TEL on organisation activities, how internal and external communication could benefit from the development and implementation of the TEL curriculum? How marketing of TEL services could be fostered? These issues will be investigated as well. Other issues of growing importance, such as what is needed for marketing and development of business plans for TEL services in a variety of organisations, e.g., educational, business and community organisations, might also be considered in the future work.

To summarise and to conclude, organisations offering TEL services have to implement market research and identify their clients. TEL should be integrated into all marketing and business strategic steps within the organisation. All tools and methods should be analysed and carefully selected to start and implement efficient marketing, and plan business models. Marketing and business models should be closely consistent with the strategy of the organisation itself.

Successful TEL integration should be implemented systematically, following strategic visions of the organisation, generating ideas and concepts, service design, launching their offers, monitoring TEL service participants, maintenance, receiving customer's feedback and improving TEL service quality on the basis of this feedback. Communication (internal and external) plays a major part in marketing and business development, and should be recognised by all staff and stakeholders of the organisation.

Online marketing is already embedded in TEL service development with the use of internet itself. Organisation culture should support and facilitate natural development and use of TEL elements. Image, brand and customer

needs play most important roles and should be a part of organisation awareness about TEL service marketing.

The need for marketing and development of business plan, one could say, improved and increased accessibility creates new managerial capacities and possibilities to share and market TEL services. Marketing strategies should be developed on strategic and managerial level to foster TEL service provision and new organisational learning modes.

INTEGRATION OF TECHNOLOGY ENHANCED LEARNING IN THREE TYPES OF ORGANISATIONS. EMPIRICAL FINDINGS
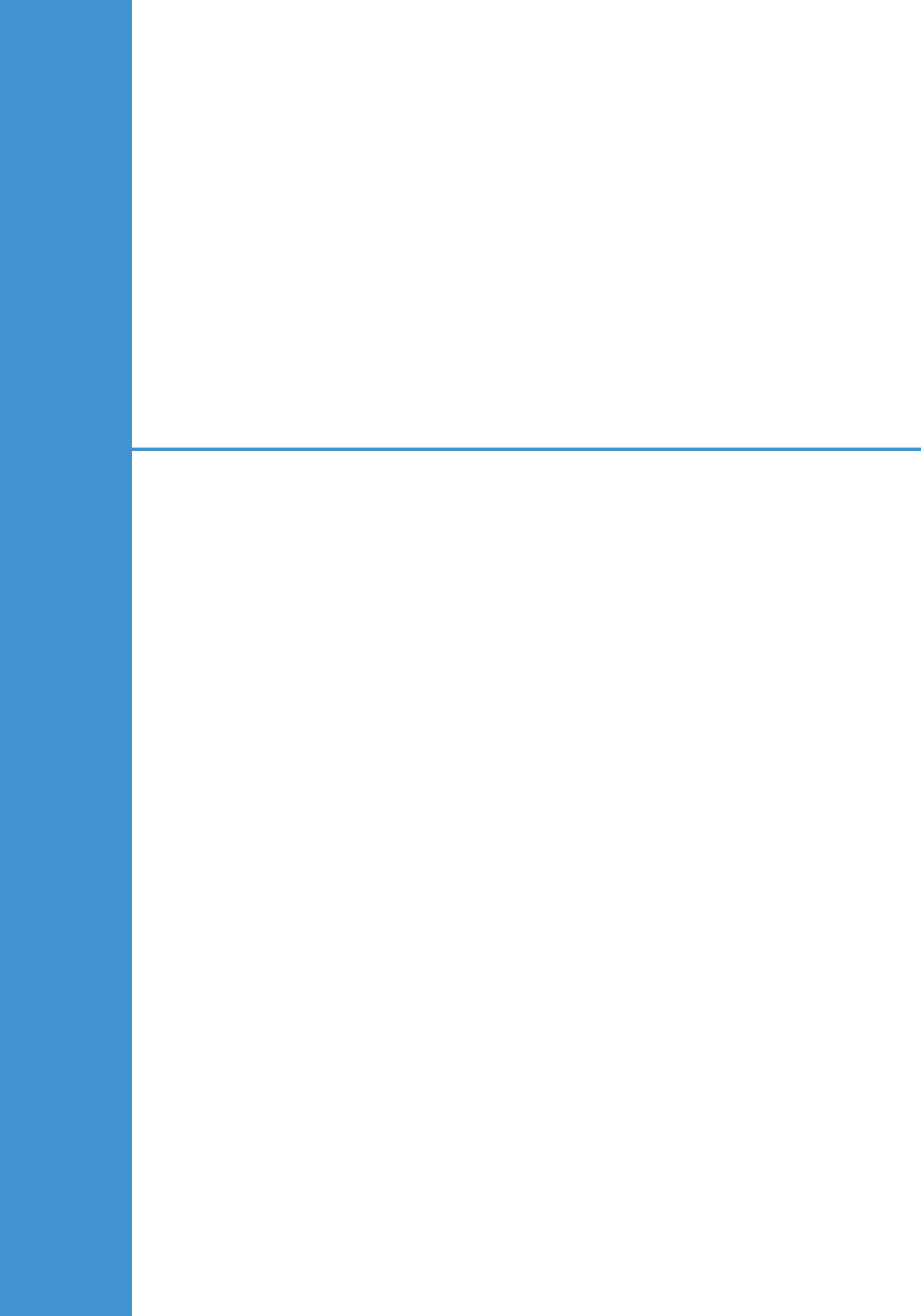
TEL integration criteria groups have been tested using a quantitative research method, i.e. a quantitative questionnaire survey (see Annex 1) for three types of organisations: business, education and community. The results of the research are presented according to each criteria group: strategy and management, ICT infrastructure, TEL curriculum, continuing professional staff development, support systems, quality assurance procedures, and marketing and business. The results for each criteria group are presented and described in the following way:

• how each criterion is met within the group (by three types of organisations);

• calculating general index for each criteria group (for three types of organisations); then

• calculating the average of responses for each criterion within each criteria group (for three types of organisations);

• comparing the average of responses for each criterion within each criteria group (for three types of organisations).

Strategy and management

Common intentions of the organisation to implement TEL should be first reflected in strategic aims set by the organisation and documented in strategic documents so that both the top management and all organisation staff members should have a clear vision.

The research indicated that not all statements identifying the strategy are valued equally by the respondents. The responses show that the top managers

mostly react to bottom up initiatives and that TEL policy in the organisation is learner-oriented and personalised in terms of existing knowledge and skills – about 70 percent of the respondents agree with these criteria (Fig. 18). Over 60 percent of respondents express the opinion that institutional vision stimulates and encourages the implementation of TEL. However, the highest number of the respondents doubt with regard to the existing monitoring processes of TEL integration. The respondents also have difficulty in recognising that the strategy of the organisation is supported with action plans for integrating TEL curriculum into institutional activities.
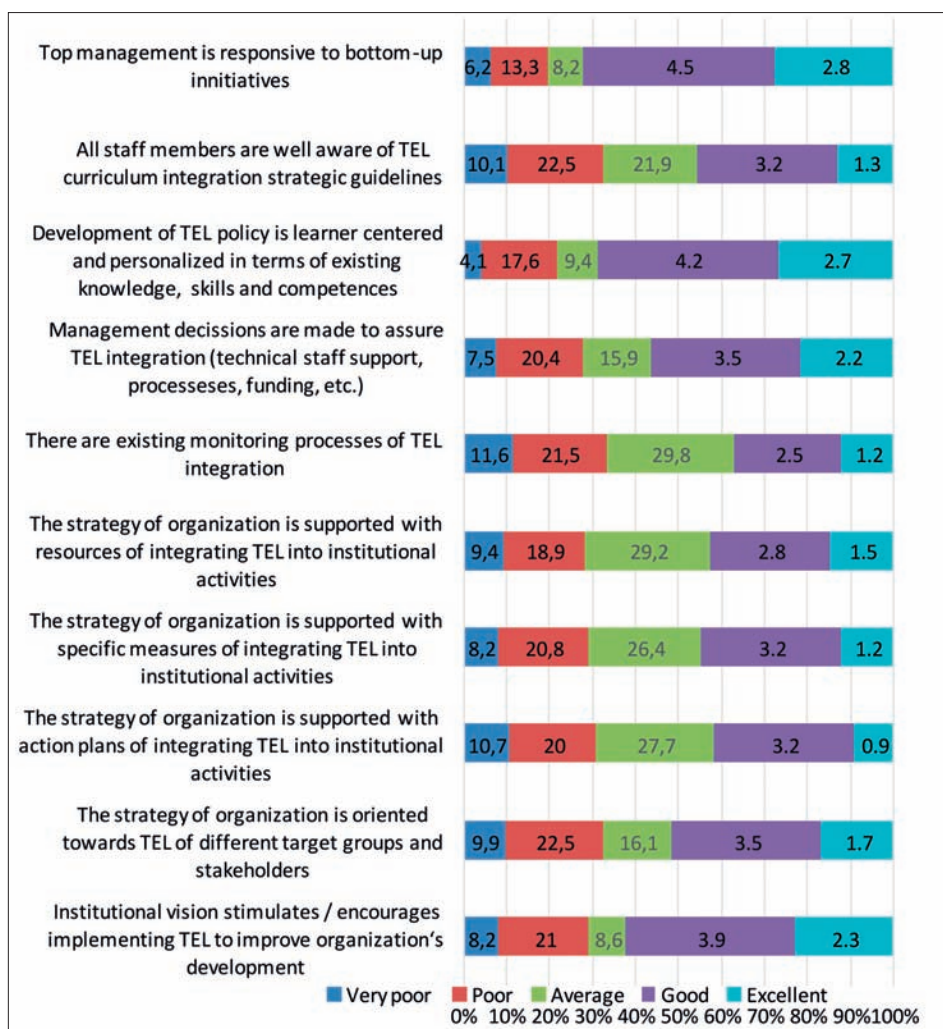
Figure 18. Expression of each criterion within Strategy and management criteria group of all participating organisations

Figure 19. General index of Strategy and management criteria group for three types of organisations

The highest strategy and management index was identified in the business organisation, the lowest – in the community organisation (Fig. 19). ANOVA results show that the difference is statistically significant (p=0.000). Differences are very obvious among the estimated variables in different organisations (ANOVA p=0.000).

Figure 20. Means of responses for each Strategy and management criterion for three types of organisations

Comparing the respondents' opinion (means of evaluations of separate statements) in terms of different types of organisations, it can be seen, as illustrated in Fig. 20, that in all cases the highest evaluations were received by the participants of business organisations. The statement which received the lowest evaluations in 'all types of organisations is that all staff members are well aware of TEL curriculum integration strategic guidelines'; although the evaluation of this statement differed in all types of organisations and the difference was found to be statistically significant (p=0.000, Table 19), but the means of the evaluations of this statement were the lowest. Due to the specificity of organisations, the lowest means of evaluations for some statements were identified in community organisations: valuing TEL implementation strategy, monitoring, activity plan for TEL implementation. However, the lowest evaluations in the educational organisation were attributed to the evaluation of managerial decisions which are necessary for TEL implementation.

Table 19. Comparison of Strategy and management group criteria means for three types of organisations

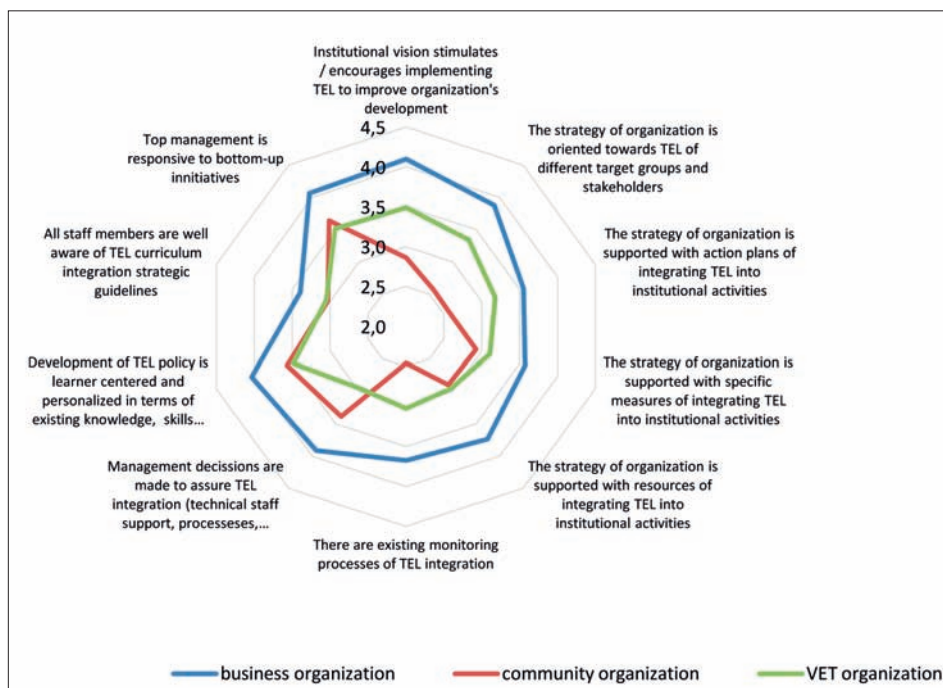|	Strategy and management	business organisations	community organisations	education organisations	Kruskal-Wallis p
1	Institutional vision stimulates/encourages implementing TEL to improve organisation's development	4.10	2.86	3.49	0.000
2	The strategy of organisation is oriented towards TEL of different target groups and stakeholders	3.88	2.58	3.34	0.000
3	The strategy of organisation is supported with action plans of integrating TEL into institutional activities	3.55	2.57	3.18	0.000
4	The strategy of organisation is supported with specific measures of integrating TEL into institutional activities	3.57	2.92	3.10	0.000
5	The strategy of organisation is supported with resources of integrating TEL into institutional activities	3.74	2.90	2.95	0.000

6	There are existing monitoring processes of TEL integration	3.67	2.46	3.02	0.000
7	Management decisions are made to assure TEL integration (technical staff support, processes, funding, etc.)	3.92	3.39	2.96	0.000
8	Development of TEL policy is learner centred and personalised in terms of existing knowledge, skills and competencies	4.04	3.57	3.49	0.000
9	All staff members are well aware of TEL curriculum integration strategic guidelines	3.39	3.03	3.05	0.013
10	Top management is responsive to bottom-up initiatives	4.06	3.64	3.52	0.000

Assessing strategic and management decisions in different types of organisations, employees' opinion differed, and the difference was found to be statistically significant, i.e. the mean value of staff evaluations for different statements varied from 3.39 to 4.10 in business organisation, from 2.46 to 3.64 in community organisation, from 2.95 to 3.49 in vocational education organisation.

ICT Infrastructure

Analysing the situation in organisations with regard to ICT and infrastructure to support TEL, it is possible to notice that all statements were evaluated favourably; eight statements out of ten were marked as "good" or "excellent", which exceeded 50 percent (Fig. 2); however, there is no statement the positive evaluation of which would be over 60 percent. Such results show that constant attention to development of ICT infrastructure for TEL implementation and related decisions is needed.
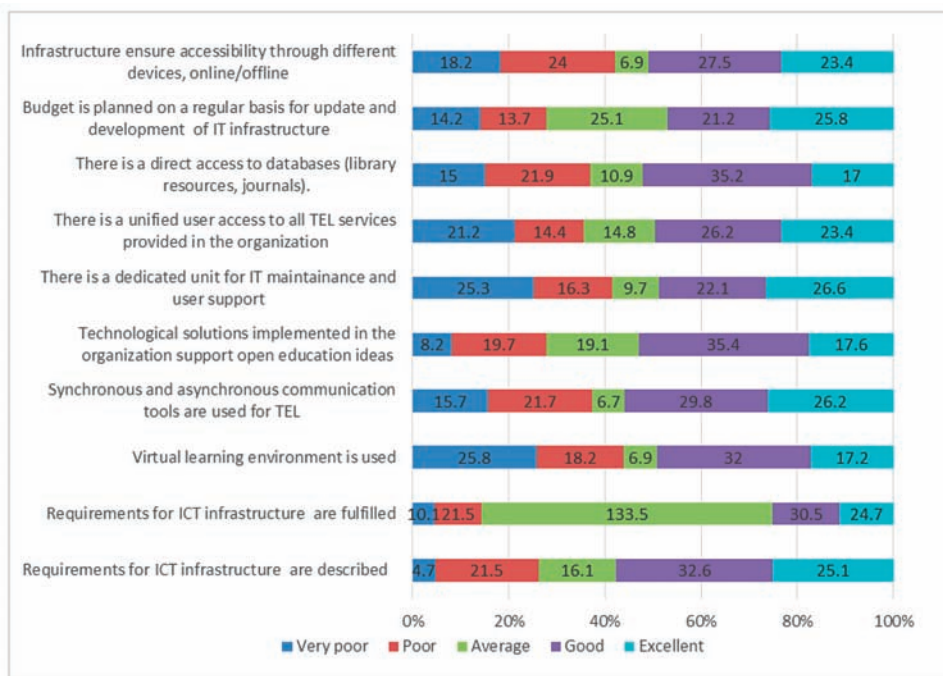
Figure 21. Expression of each criterion within ICT infrastructure criteria group of all participating organisations

The most positive evaluations were attributed to the statements regarding clear requirements for information communication technology infrastructure (ICT), and synchronous and asynchronous communication tools used for TEL.

The statements regarding the use of virtual learning environment and the existence of a dedicated unit for IT maintenance, user counselling and support received the lowest evaluations.

Figure 22. General index of ICT infrastructure criteria group for three types of organisations.

The index shows that the highest evaluations were attributed to the statements in the business organisation, the lowest – in the community organisation (Fig. 22). ANOVA calculations show that comparing indexes in different types of organisations statistically significant differences were obtained (p=0.000).
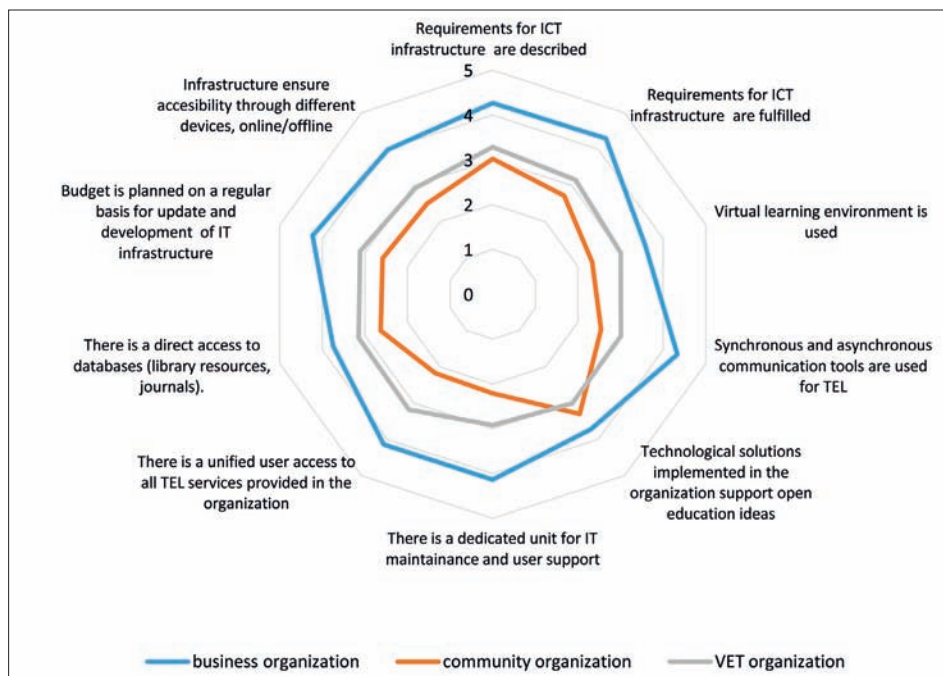
Figure 23. Means of responses for each ICT infrastructure criterion in three types of organisations

As ICT is the specialisation of the chosen business organisations, it is obvious that the highest averages were obtained from business organisations' employees while assessing all statements (Table 20). It is necessary to admit that the lowest assessment in this type of organisation was obtained while assessing the application of virtual learning environment. Besides, it is worth noting that the evaluations of this statement were the lowest in all types of organisations. It shows that the implementation of TEL in various organisations requires adequate attention to the implementation of virtual learning environments and their application. As vocational education and

training organisations have a longer history, their infrastructure is much more advanced than that of community organisations; therefore, evaluations of the staff from education organisation were much higher with regard to almost all statements (with the exception of the statement on relating teaching to open education).

Table 20. Comparison of ICT infrastructure criteria group means for three types of organisations

	IT infrastructure	business organisations	community organisations	education organisations	Kruskal-Wallis p
1	Requirements for ICT infrastructure are described	4.26	3.02	3.28	0.000
2	Requirements for ICT infrastructure are fulfilled	4.30	2.72	3.15	0.000
3	Virtual learning environment is used	3.57	2.34	3.00	0.000
4	Synchronous and asynchronous communication tools are used for TEL	4.34	2.54	3.01	0.000
5	Technological solutions implemented in the organisation support open education ideas	3.72	3.30	3.01	0.000
6	There is a dedicated unit for IT maintenance and user support	4.14	2.21	2.92	0.000
7	There is a unified user access to all TEL services provided in the organisation	4.14	2.18	3.18	0.000
8	There is a direct access to databases (library resources, journals).	3.75	2.63	3.15	0.000
9	Budget is planned on a regular basis for update and development of IT infrastructure	4.23	2.59	3.11	0.000
10	Infrastructure ensures accessibility through different devices, online/offline	3.99	2.50	2.93	0.000

Comparing the evaluations of all statements by different types of organisations it was found that the differences in evaluations are statistically significant in all cases (p=0.000, Table 20). The evaluations in business

organisations range from 3.57 to 4.34, in community organisation – from 2.18 to 3.30 and vocational education organisation – from 2.92 to 3.28. The lowest evaluation in business organisation exceeds the highest evaluation of other two organisations.

Technology enhanced learning Curriculum

Curriculum and didactics are very important in TEL training. It is one of the most understandable and most positively evaluated criteria groups.
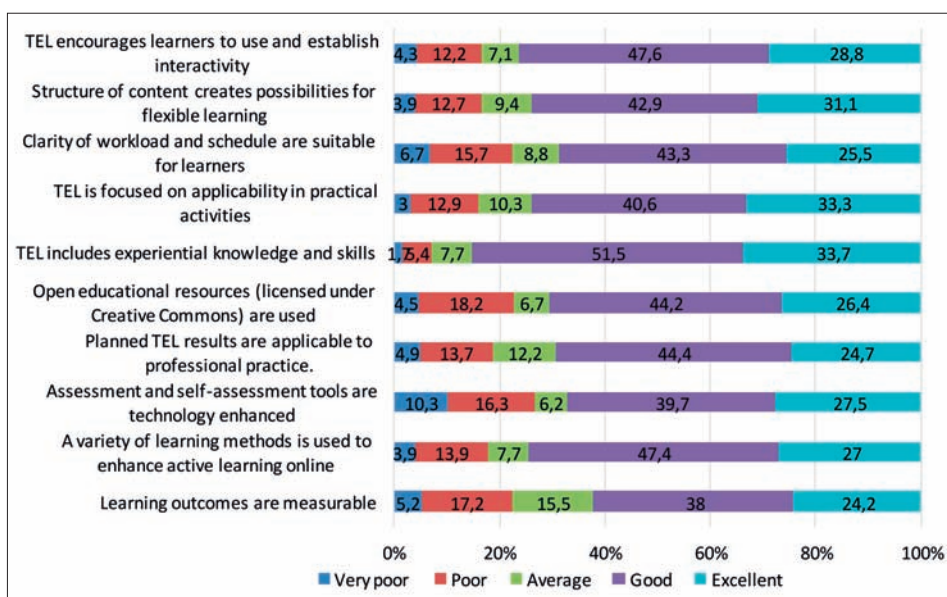
Figure 24. Expression of each criterion within TEL curriculum criteria group of all participating organisations.

Analysing how the statements on the teaching/learning curriculum and methods were assessed, it is evident that positive evaluations exceed 60 percent (Fig. 24) Even 85.2 percent of the respondents agree that experiential knowledge and skills are important in TEL process. Over 70 percent of them support the statements that using TEL, a variety of learning methods are used to enhance active learning and that open education resources are used while learning (free access of textbooks, documents, video material), that TEL focuses on practically used teaching/learning outcomes, that TEL curriculum

structure creates possibilities for flexible learning and enhances learners' mutual cooperation.
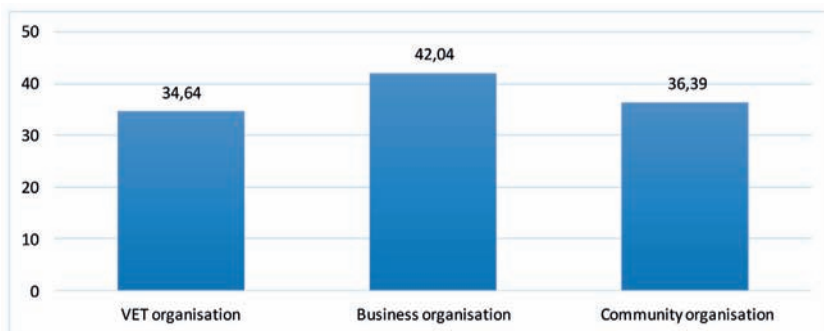
Figure 25. General index of TEL curriculum criteria group for three types of organisations.

Having calculated the index, evaluations of business organisation representatives were the highest in comparison with the evaluations obtained from education or community organisations. It is interesting to note that evaluations of community organisation staff were higher in comparison with those of education organisations (TEL is not widely used in training provided in vocational education institutions). ANOVA results show statistically significant differences (p=0.000, Fig. 26).
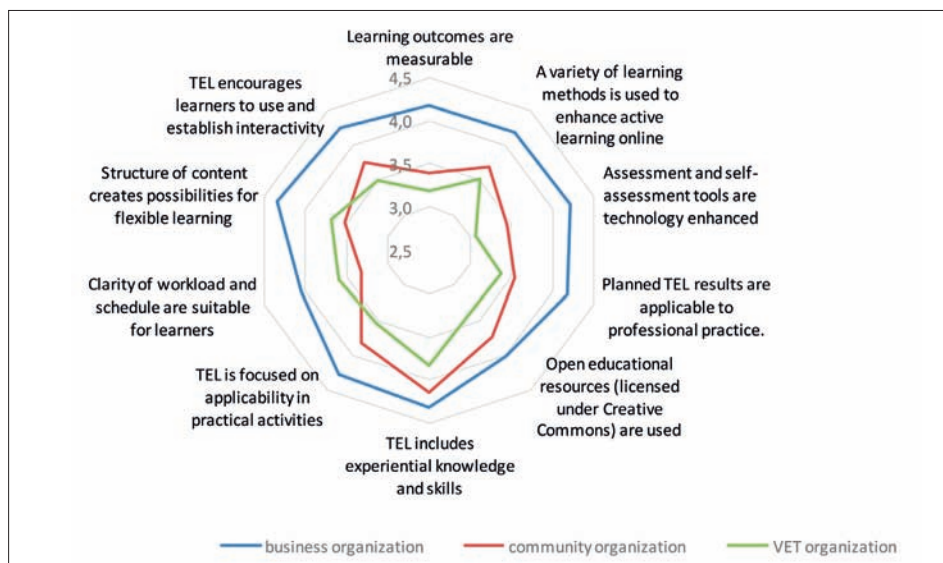
Figure 26. Means of responses for each TEL curriculum criterion for three types of organisations

Assessing the elements of curriculum and didactics, it is noticeable that all means of responses received from business organisation respondents are highest in all cases; in addition, experiential learning knowledge and skills are used most often (Fig. 27). Although it might be assumed that in the education organisation, elements of curriculum and didactics should receive the highest evaluations, 8 out of 10 statements were still higher evaluated by the representatives of community organisations. In all types of organisations the preference is given to a variety of methods and interactivity. Problematic areas appeared to be the following: use of technology enhanced assessment and self-assessment tools, clarity and simplicity of schedule.

Table 21. Comparison of TEL curriculum group criteria means for three types of organisations.

|	IT infrastructure	business organisations	community organisations	education organisations	Kruskal-Wallis p
1	Learning outcomes are measurable	4.18	3.40	3.19	0.000
2	A variety of learning methods is used to enhance active learning online	4.19	3.68	3.52	0.000
3	Assessment and self-assessment tools are technology enhanced	4.23	3.44	3.06	0.000
4	Planned TEL results are applicable to professional practice.	4.19	3.54	3.37	0.000
5	Open educational resources (licensed under Creative Commons) are used	4.01	3.73	3.35	0.000
6	TEL includes experiential knowledge and skills	4.32	4.15	3.83	0.000
7	TEL is focused on applicability in practical activities	4.27	3.83	3.54	0.000
8	Clarity of workload and schedule are suitable for learners	4.05	3.32	3.59	0.000
9	Structure of content creates possibilities for flexible learning	4.34	3.53	3.68	0.000
10	TEL encourages learners to use and establish interactivity	4.25	3.77	3.51	0.000

The differences between evaluations of all statements in different types of organisations are statistically significant (Table 21). In business organisation,

the mean of evaluations of all statements exceeds 4, whereas in the rest two types of organisations only one variable was evaluated as high, i.e. the mean of one variable was higher in community organisation assessment.

Continuing professional staff development

Continuing vocational staff development is one of important factors in TEL implementation, as emergence of new technologies, their implementation in the organisation and application in the teaching process are impossible without continuing professional development.
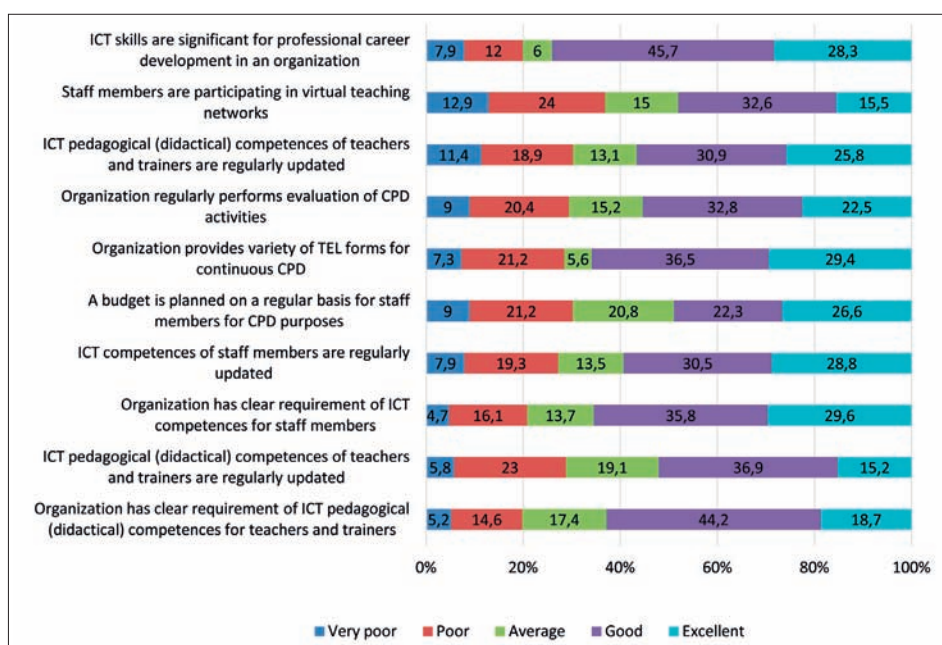
Figure 27. Expression of each criterion within Continuing professional staff development criteria group of all participating organisations (CPD – Continuing professional development)

One of very important factors is continuing staff development. It is necessary that people working in the organisation knew about the opportunities provided for them, and it is also necessary to manage this process. The competence of lecturers who provide training should also be high. As technologies are constantly

developing, it is also necessary for staff to develop and improve their skills in technology area. As illustrated in Fig. 27, continuing professional staff development is an ongoing process. However, while evaluating the statement that employees participate in virtual teaching networks, the sum of positive evaluations was lower than 50 percent. The most positive evaluations were obtained while evaluating the statements that ICT skills are significant for professional career development in the organisation, and also that organisation provides a variety of TEL curriculum forms for continuing development of staff (seminars, learning at the workplace), and that organisation has clear requirements for ICT competence for employees. It is also interesting to note that although didactical competence was evaluated rather high, a great number of staff admitted that ICT application competences of teacher are not constantly updated (42.1 percent).

Figure 28. General index of Continuing professional staff development criteria group for three types of organisations

This aspect, similarly to the previously analysed aspects, was most favourably evaluated in the business organisation and least favourably – in educational organisation (Fig. 28). In the educational organisations there are formal requirements and complying with these requirements guarantees you a possibility to remain in the workplace, whereas in business organisations, the most important aspect is professional development. Community organisation representatives, in order to survive, also have to be interested in innovations and apply them in their practical activity. ANOVA results indicate that the differences are statistically significant (p=0.000).
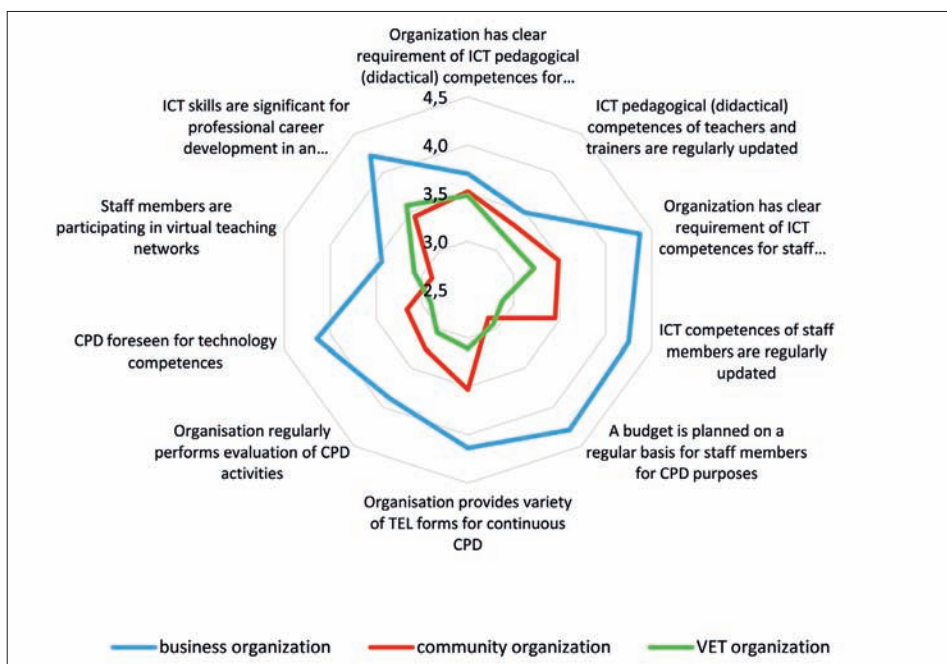
Figure 29. Means of responses for each Continuing professional staff development criterion for three types of organisations

Evaluating continuing professional staff development, the same pattern is evident as in evaluating the previously analysed criteria groups, i.e., the average rankings for all statements evaluated by business organisation staff were the highest. It is interesting to note that there were only slight differences between the means of business organisation respondents' ranking of current pedagogical (didactical) competence requirements and their updating (Fig. 29). On the basis of the research results, it is possible to state that in all types of organisations various opportunities for professional development are offered (mostly in business organisations, least in vocational education and training institutions); ICT knowledge and skills are important for organisational development (mostly in business organisations, least in community organisations). However, participation in virtual professional networks appeared to be the area which should be developed most. Opportunities for individual professional development provided by today's professional networks are enormous, but they are insufficiently used.

Table 22. Comparison of Continuing professional staff development group criteria means for three types of organisations.

	Continuing professional staff development	business organisations	community organisations	education organisations	Kruskal-Wallis p
1	Organisation has clear requirement of ICT pedagogical (didactical) competencies for teachers and trainers	3.70	3.52	3.48	0.066
2	ICT pedagogical (didactical) competencies of teachers and trainers are regularly updated	3.49	3.32	3.17	0.060
3	Organisation has clear requirement of ICT competencies for staff members	4.37	3.49	3.22	0.000
4	ICT competencies of staff members are regularly updated	4.25	3.45	2.88	0.000
5	A budget is planned on a regular basis for staff members for CPD purposes	4.29	2.86	2.94	0.000
6	Organisation provides variety of TEL forms for CPD	4.14	3.53	3.11	0.000
7	Organisation regularly performs evaluation of CPD activities	3.88	3.25	3.05	0.000
8	CPD foreseens for technology competences	4.15	3.16	2.91	0.000
9	Staff members are participating in virtual teaching networks	3.44	2.89	3.08	0.000
10	ICT skills are significant for professional career development in an organisation	4.22	3.44	3.58	0.000

Analysing the means of evaluations of separate statements, no statistically significant differences were found comparing the evaluations of the following variables: organisation has clear requirements for teacher and trainer ICT pedagogical (didactical) competences (p=0.066>0.05, Table 22) and ICT pedagogical (didactical) competencies of teachers and trainers are regularly updated (p=0.060>0.05). The differences in the evaluations of other statements were statistically significant.

Support systems

Support for all participants of TEL is necessary both at the outset of the TEL process implementation and during the process.
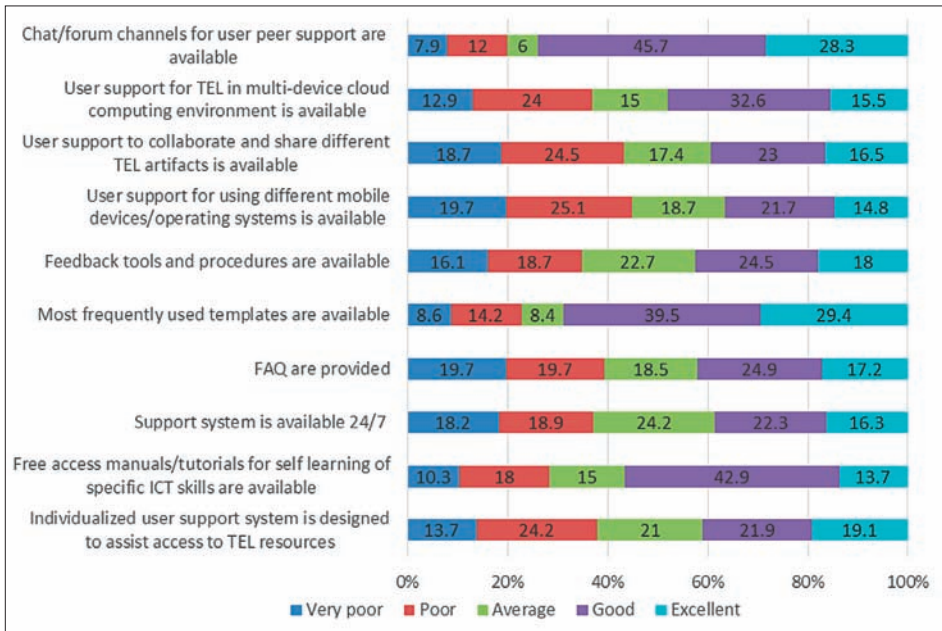
Figure 30. Expression of each criterion within Support systems criteria group of all participating organisations (FAQ – Frequently asked questions).

The evaluation of the statements regarding TEL support systems is one of the most diverse: statements regarding the availability of organisation online forum channels for user peer support and the prepared most frequently used templates for staff learning convenience were evaluated very positively: about 70 percent of respondents assigned the values "good" and "excellent"; whereas the statement that support is provided during learning for users using different mobile devices/operating systems were positively evaluated only by slightly more than 35 percent of the respondents (Fig. 30).
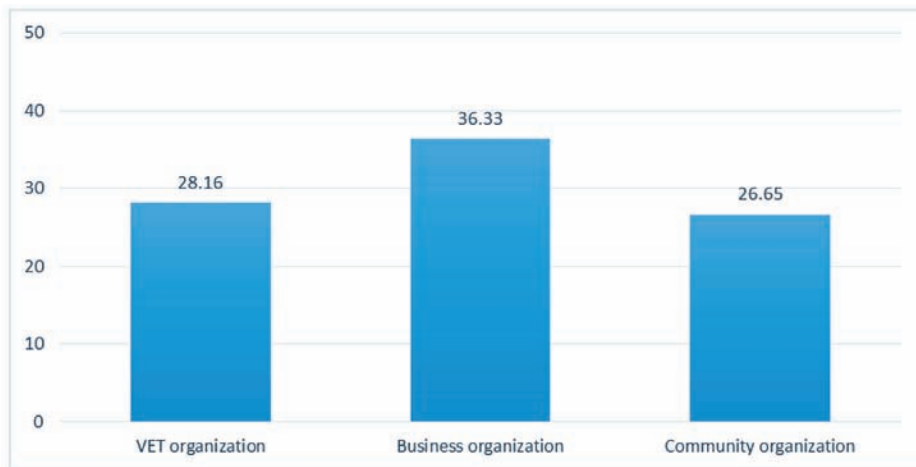
Figure 31. General index of Support systems criteria group for three types of organisations

Comparing the support systems existing in different types of organisations, the obtained index yielded the highest evaluations in business organisations (Fig. 31). The evaluations of community organisation staff are the lowest, but not statistically different from evaluations received from education organisation staff. Comparing the responses received from all three types of organisations, a statistically significant difference was found (p=0.000).

Although the comparison of the generalised indexes shows that business organisation respondents' evaluations are the highest, but comparing the evaluations of separate statements it is evident that the means of evaluations provided by community organisation staff are in some cases even higher than those of business organisations (Fig. 32). Community organisation staff assigned higher values to availability of most frequently used templates; also the availability of free access manuals/tutorials for self learning of specific ICT skills were evaluated almost equally in business and community organisations (the value allotted to this statement by vocational education organisation respondents was considerably lower). It is interesting to note that it is these statements which were evaluated by business representatives considerably lower in comparison to other statements, whereas the evaluations received from education and community organisation representatives were much higher than those attributed to other statements. Due to the rapid development

of technologies, the users intend to use various technological solutions in the teaching and learning process as soon as possible, but TEL implementation is not such a fast process; therefore, the value assigned to the statement regarding the availability of user support for using different mobile devices/operating systems was relatively the lowest among all respondents' evaluations.
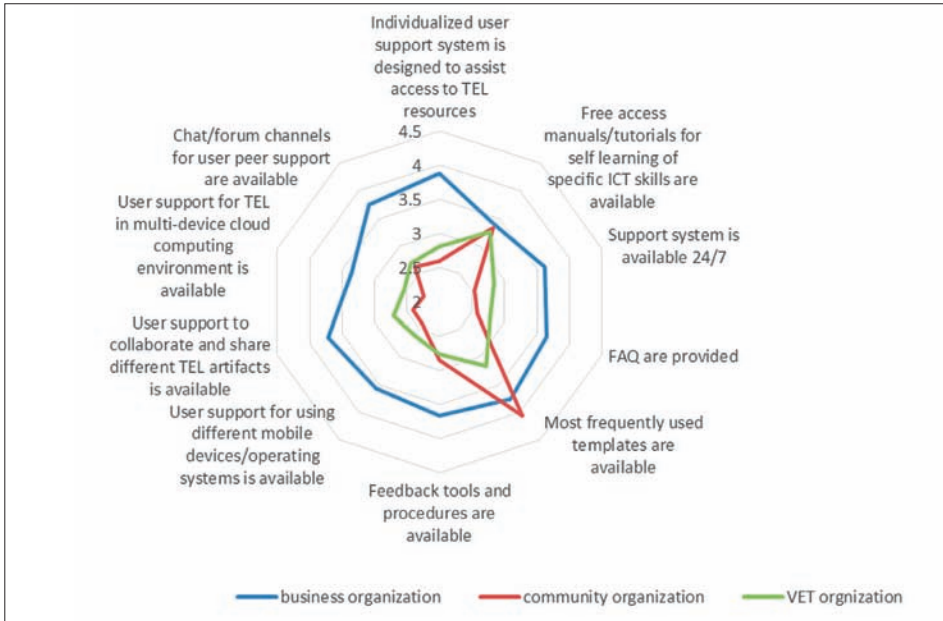
Figure 32. Average of responses for each Support systems criterion for three types of organisations

Table 23. Comparison of Support systems group criteria means for three types of organisations.

	Support systems	business organisations	community organisations	education organisations	Kruskal-Wallis p
1	Individualised user support system is designed to assist access to TEL resources	3.87	2.58	2.80	0.000
2	Free access manuals/tutorials for self-learning of specific ICT skills are available	3.37	3.33	3.25	0.413
3	Support system is available 24/7	3.62	2.54	2.84	0.000
4	FAQ are provided	3.65	2.58	2.78	0.000
5	Most frequently used templates are available	3.76	4.06	3.17	0.000
6	Feedback tools and procedures are available	3.66	2.86	2.76	0.000
7	User support for using different mobile devices/operating systems is available	3.57	2.42	2.61	0.000
8	User support to collaborate and share different TEL artefacts is available	3.72	2.41	2.71	0.000
9	User support for TEL in multi-device cloud computing environment is available	3.35	2.25	2.55	0.000
10	Chat/forum channels for user peer support are available	3.75	2.61	2.70	0.000

The means of the value attributed to the statement regarding the availability of free access manuals/tutorials for self learning of specific ICT skills were not statistically different in different types of organisations (p=0.413, Table 23); however, regarding all other statements, Kruskal Wallis test results indicate that the differences are statistically significant (p=0.000).

Quality assurance procedure

Quality assurance in implementing and applying TEL factor overlaps with other ones analysed previously, i.e. general enterprise strategy, didactical staff skills, infrastructure and etc. However, research also identified separate statements which helped to determine TEL quality assurance elements existing in the organisation.
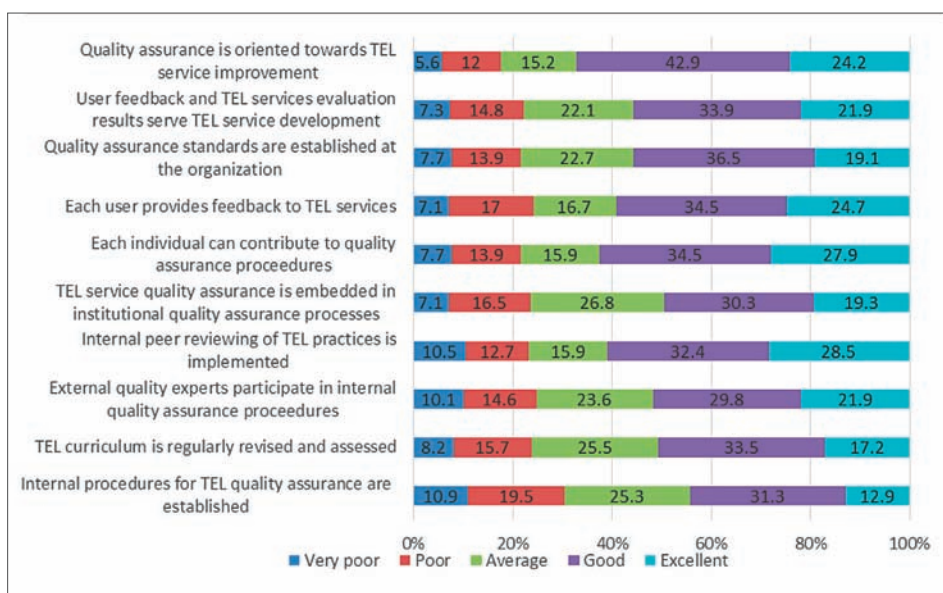
Figure 33. Expression of each criterion within Quality assurance procedures criteria group of all participating organisations

TEL curriculum quality assurance is one of very important constituents of the TEL process. The sum of values "good" and "excellent" assigned only to two statements out of ten presented for respondents' evaluation, does not exceed 50 percent: the least evaluated statements were "Internal procedures for TEL curriculum quality assurance are established" and "TEL curriculum quality assurance is embedded in institutional quality assurance processes" (Fig. 33). On the other hand, the highest numbers of positive values were attributed to such statements as "Quality assurance is oriented towards TEL service improvement"; that each organisation member can contribute to quality

assurance procedures, and that TEL curriculum is assessed by colleagues. Over 60 percent of the respondents agreed with these statements.
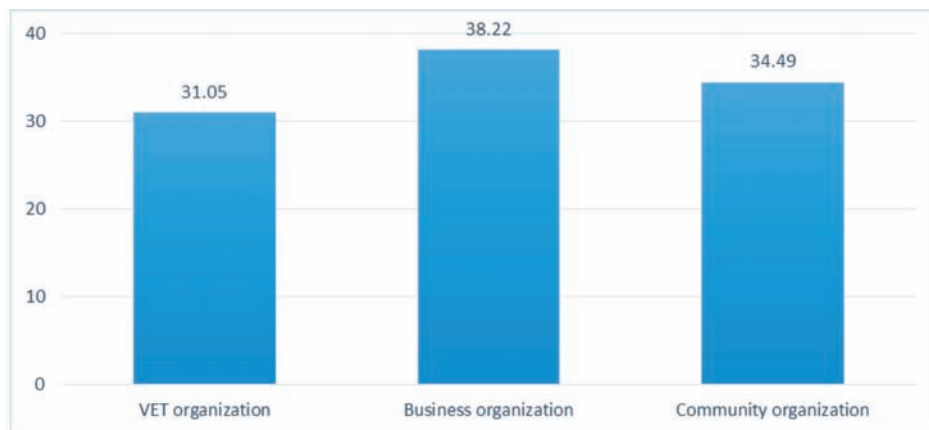
Figure 34. General index of Quality assurance procedures criteria group for three types of organisations

Comparing TEL curriculum quality evaluation in different types of organisations, it was found that the highest evaluations were received from business organisation representatives and the lowest – from ones from vocational education institutions (Fig. 34). Although quality assurance is a very important factor in education institutions, but in vocational education institutions where TEL is not very widely applied, TEL curriculum evaluation did not receive adequate attention. ANOVA results indicate that the differences are statistically significant (p=0.000).
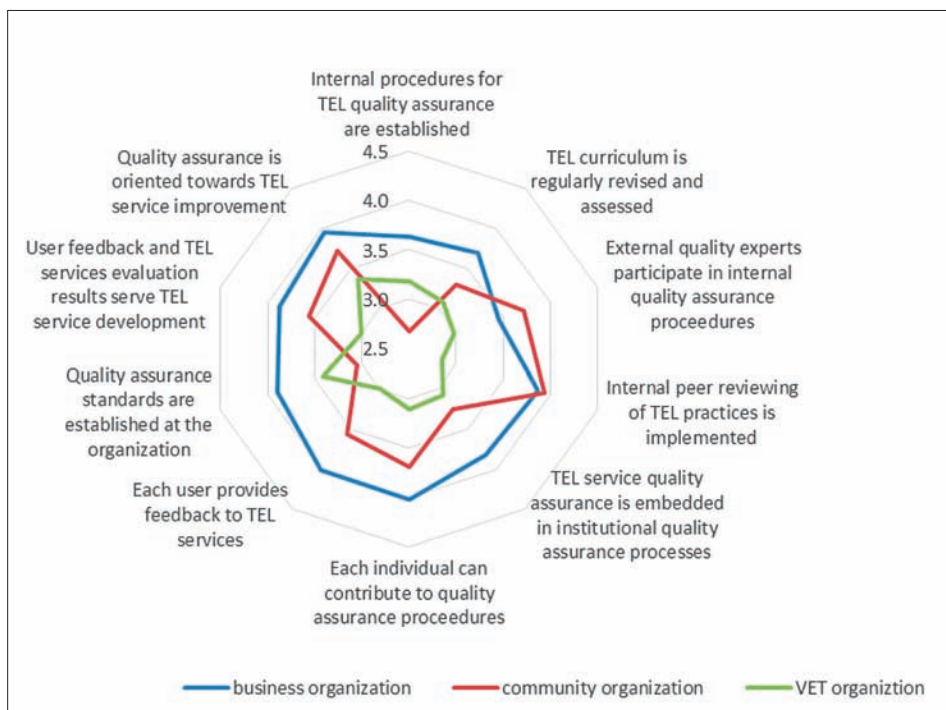
Figure 35. Average of responses for each Quality assurance procedure criterion for three types of organisations

Although the general index indicated that evaluation of Quality assurance procedure was the highest in business organisations, quality assurance evaluation means almost did not exceed 4 points out of 5 possible (Fig. 35). This shows that high requirements are set for quality assurance, and it is not so easy to meet these requirements in various organisations. Furthermore, in two cases out of ten, the highest evaluations were received from community organisations. The respondents of community organisations allocated the highest values to the following two statements: "External quality experts participate in internal quality assurance procedures" and "Internal peer reviewing of TEL practices is implemented". The differences presumably occur due to the fact that in ICT companies the result is meant for the customer or contracting party, therefore, the processes are less exported; on the other hand, in community organisation there are close relations among community members which, in turn, influences more frequent peer evaluation. It is worth

noting that low mean was found in evaluating the established internal quality assurance system, but an opportunity for each employee to contribute to quality assurance was evaluated positively.

Table 24. Comparison of Quality assurance procedures group criteria means for three types of organisations

	Quality assurance procedures	business organisations	community organisations	education organisations	Kruskal-Wallis p
1	Internal procedures for TEL quality assurance are established	3.63	2.67	3.18	0.000
2	TEL curriculum is regularly revised and assessed	3.69	3.30	3.08	0.000
3	External quality experts participate in internal quality assurance procedures	3.45	3.72	2.98	0.000
4	Internal peer reviewing of TEL practices is implemented	3.87	3.94	2.85	0.000
5	TEL service quality assurance is embedded in institutional quality assurance processes	3.82	3.25	3.08	0.000
6	Each individual can contribute to quality assurance procedures	4.02	3.70	3.10	0.000
7	Each user provides feedback to TEL services	4.01	3.57	2.99	0.000
8	Quality assurance standards are established in the organisation	3.90	3.06	3.41	0.000
9	User feedback and TEL services evaluation results serve TEL service development	3.88	3.56	3.00	0.000
10	Quality assurance is oriented towards TEL service improvement	3.95	3.72	3.37	0.000

The tendencies of evaluation in different type of organisations differ, and the differences are statistically significant (p=0.000). It is worth noting that the quality evaluations range from 3.45 to 4.02 in business organisations, from 2.67 to 3.94 in community organisations and from 2.85 to 3.41 in vocational education organisations.

Marketing and business

TEL use in organisations for service marketing and success, and promotion of TEL processes within the organisations and outside it, as well as management are also important factors which contribute to successful TEL implementation int o the organisation.
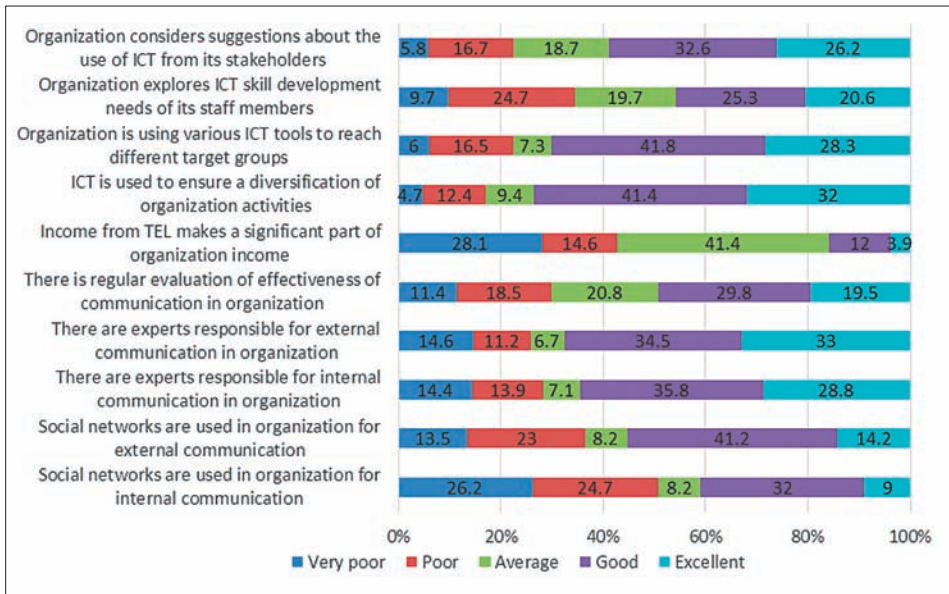
Figure 36. Expression of each criterion within Marketing and business criteria group of all participating organisations

Evaluation of internal and external communications is rather diverse. According to the respondents, income received from TEL constitutes a significant part of organisation income; however; only 15 percent of the respondents agree with this statement. On the other hand, over 70 percent of the respondents agree that ICT is used to ensure a diversification of organisation activities. Furthermore, such statements, as the use of various ICT tools by the organisation to reach different target groups and that there are experts responsible for external communication in organisation, were assessed favourably. However, the respondents state that social networks are used for internal communication more rarely and that effectiveness of communication in organisation is not evaluated regularly.

Figure 37. General index of Marketing and business criteria group for three types of organisations.

Aspects of internal and external communication are evaluated differently in all three types of organisations (Fig. 37). The highest means were found in business organisation evaluations, the lowest – in community organisations. It can be explained by the fact that vocational education institutions, aiming at attracting more students, have developed their external communication rather well, although they still lag behind business organisations regarding this aspect. ANOVA yielded statistically significant differences (p=0.000).
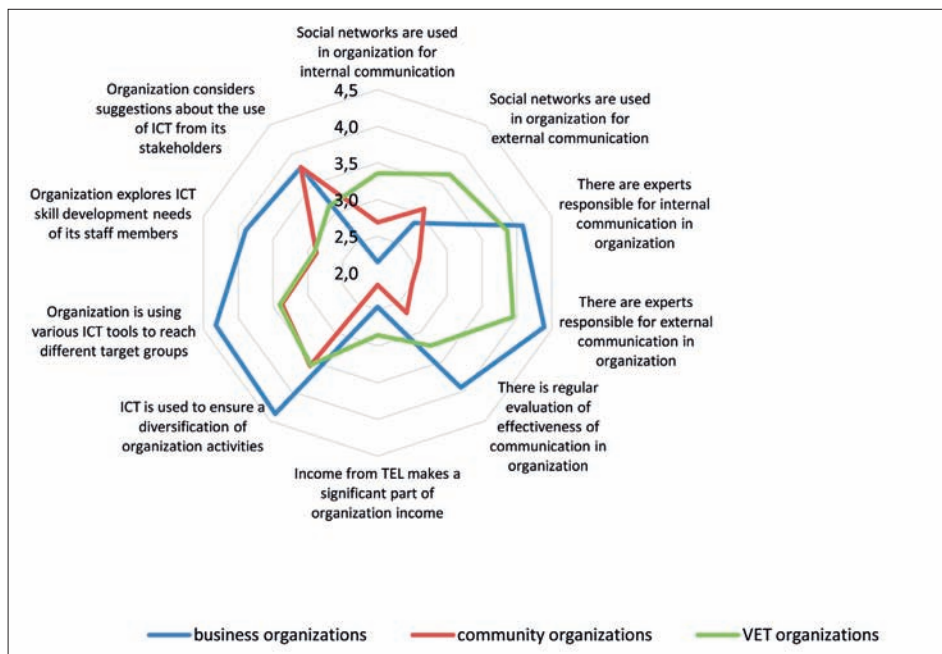
Figure 38. Means of responses for each Marketing and business group criterion for three types of organisations

The means of evaluations with regard to this criterion were most unexpected. Although business organisations are visible, their activity is clear, but the highest evaluations were found in evaluating 6 statements out of 10 (Fig. 38). It was found that in business organisations (as well as in others) TEL implementation does not increase organisation's profitability, and also that social networks are not used for organisation's internal communication. It is evident that ICT contributes to marketing activities, as it is used to ensure a diversification of organisation activities.

Table 25. Comparison of Marketing and business group criteria means for three types of organisations

	Marketing and business	business organisations	community organisations	education organisations	Kruskal-Wallis p
1	Social networks are used in organisation for internal communication	2.15	2.69	3.36	0.000
2	Social networks are used in organisation for external communication	2.85	3.08	3.67	0.000
3	There are experts responsible for internal communication in organisation	4.08	2.59	3.86	0.000
4	There are experts responsible for external communication in organisation	4.39	2.49	3.95	0.000
5	There is regular evaluation of effectiveness of communication in organisation	3.94	2.68	3.23	0.000
6	Income from TEL makes a significant part of organisation income	2.46	2.16	2.85	0.000
7	ICT is used to ensure a diversification of organisation activities	4.38	3.57	3.56	0.000
8	Organisation is using various ICT tools to reach different target groups	4.32	3.37	3.41	0.000
9	Organisation explores ICT skill development needs of its staff members	3.89	2.88	2.91	0.000
10	Organisation considers suggestions about the use of ICT from its stakeholders	3.78	3.78	3.12	0.000

In all cases statistically significant differences were found while comparing evaluations (p=0.000, Table 25). The evaluation means range in business organisations from 2.15 to 4.39, in community organisations – from 2.16 to 3.57, in vocational education organisations – from 2.85 to 3.95.

Summarising, it is possible to conclude that representatives of business organisations provided the highest evaluations to the majority of statements. Still it is evident that not all staff members are well aware of the strategic dispositions related to TEL implementation in their organisations; they do not use virtual training environments frequently; do not participate in virtual learning networks, where they could develop their skills; skill development is not always monitored; learning environment is not always equally accessible using various devices and OS (operating system); there is no internal quality assurance system within the organisations. The above mentioned drawbacks can be attributed to the most frequently encountered barriers in TEL implementation.

Comparison of Technology enhanced learning integration strengths and weaknesses

Analysing the generalised research results, only the calculated means of general indexes for each indicator group were analysed. First, all generalised indexes were compared (without taking into account the type of organisation).
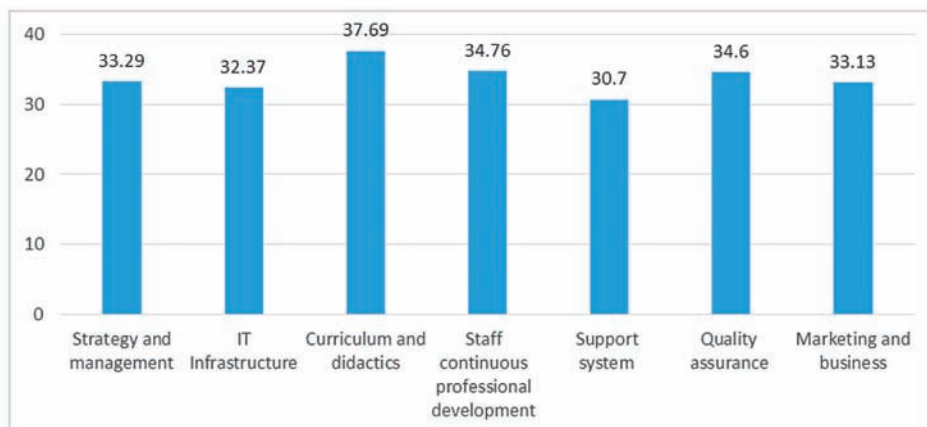
Figure 39. Comparison of criteria groups' indexes of all participating organisations

Comparing the general indexes of respondents' responses, it was found that the highest evaluations were attributed to the teaching/learning curriculum and didactics (Fig. 39). It shows that this aspect is most clearly understood by all organisations' staff members and they can evaluate it; on the other hand, it also shows that the curriculum and didactics is considered to be the most important criterion in process of TEL implementation into the organisation. Continuing professional development and TEL curriculum quality assessment were evaluated sufficiently high and almost in a similar way. The results indicate that, although not fully defined, curriculum quality concept is important for employees in various organisations. Professional development is also valued rather high as almost 35 points were attributed to this statement out of possible 50. The lowest index was obtained while evaluating TEL support systems. It is a relatively lowest index (comparing with others); however, the average of 30.7 points (out of 50 possible) shows that this indicator is also valued more as positive rather than negative. Multi-factor ANOVA indicates that differences between the evaluations are statistically significant (p=0.000). To summarize, it is possible to state that the average evaluations of all criteria groups are higher than possible average (25 points); all criteria groups are evaluated positively, the difference in evaluations is 7 points between the highest and the lowest evaluations of indexes.
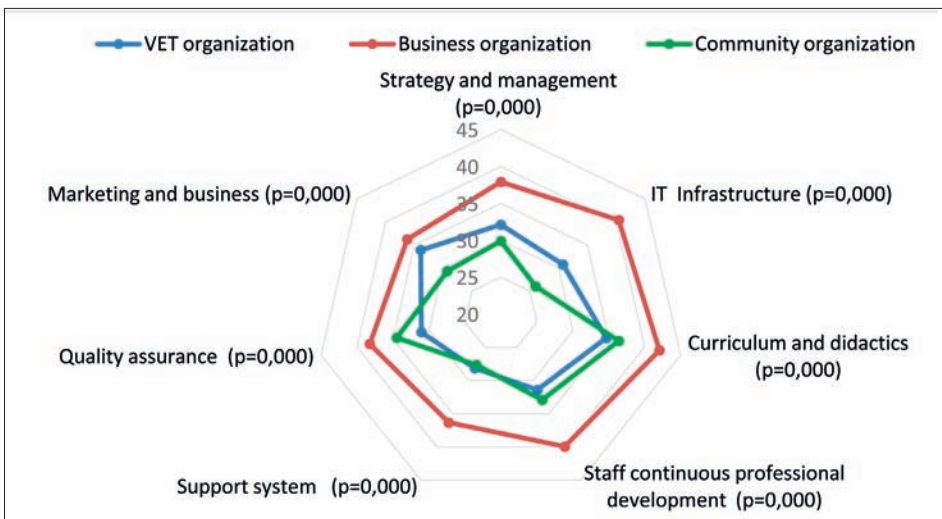
Figure 40. Comparison of average of responses for all criteria groups of all participating organisations.

As already mentioned, analysing evaluations of different types of organisations, it is possible to notice that business organisations' evaluations are the highest in all respects. As illustrated in Fig. 40, in some ways these evaluations are more distanced from the evaluations presented by the representatives of community or education organisations. The evaluations of the respondents representing educational organisations were higher four times out of seven than those of community organisations. However, community organisations' evaluations were higher than those received from education organisations with regard to TEL curriculum quality assurance, continuing professional staff development, and learning curriculum and didactics. As general tendencies indicated, the most highly evaluated criteria group was learning curriculum and didactics; consequently, in different types of organisations this area was also most highly evaluated, although statistically significant differences were found comparing the evaluations of different types of organisations. The lowest evaluations were attributed to support systems (except for business organisation which is in itself an ICT organisation). In the case of community organisation, it is possible to directly relate it to the ICT infrastructure. In the education organisation, ICT infrastructure was evaluated by 30.75 points, whereas support systems – only by 28.16 points. The lowest evaluation was 26.01 point, attributed by community organisation to ICT infrastructure assessment.

To summarize, it is possible to state that general tendencies in all three types of organisations show that the highest evaluations were received while analysing curriculum implementation, staff personal development and quality assurance. Assessment of support systems and ICT infrastructure most frequently received the lowest evaluations.

The fact that criteria group evaluations received from research participants differed significantly between business organisations and other organisations, shows better preparation of the business organisations to implement TEL. However, it is necessary to admit that this may be due to the characteristics of the chosen business organisations. All business organisations which participated in this research were related to development of information systems, application and usage of technologies.

This may have had impact upon the research findings. Therefore, it is very important to analyse a separate organisation, its situation and preparation to implement TEL. Cases of separate organisations are presented in the following chapter.

CASE STUDIES
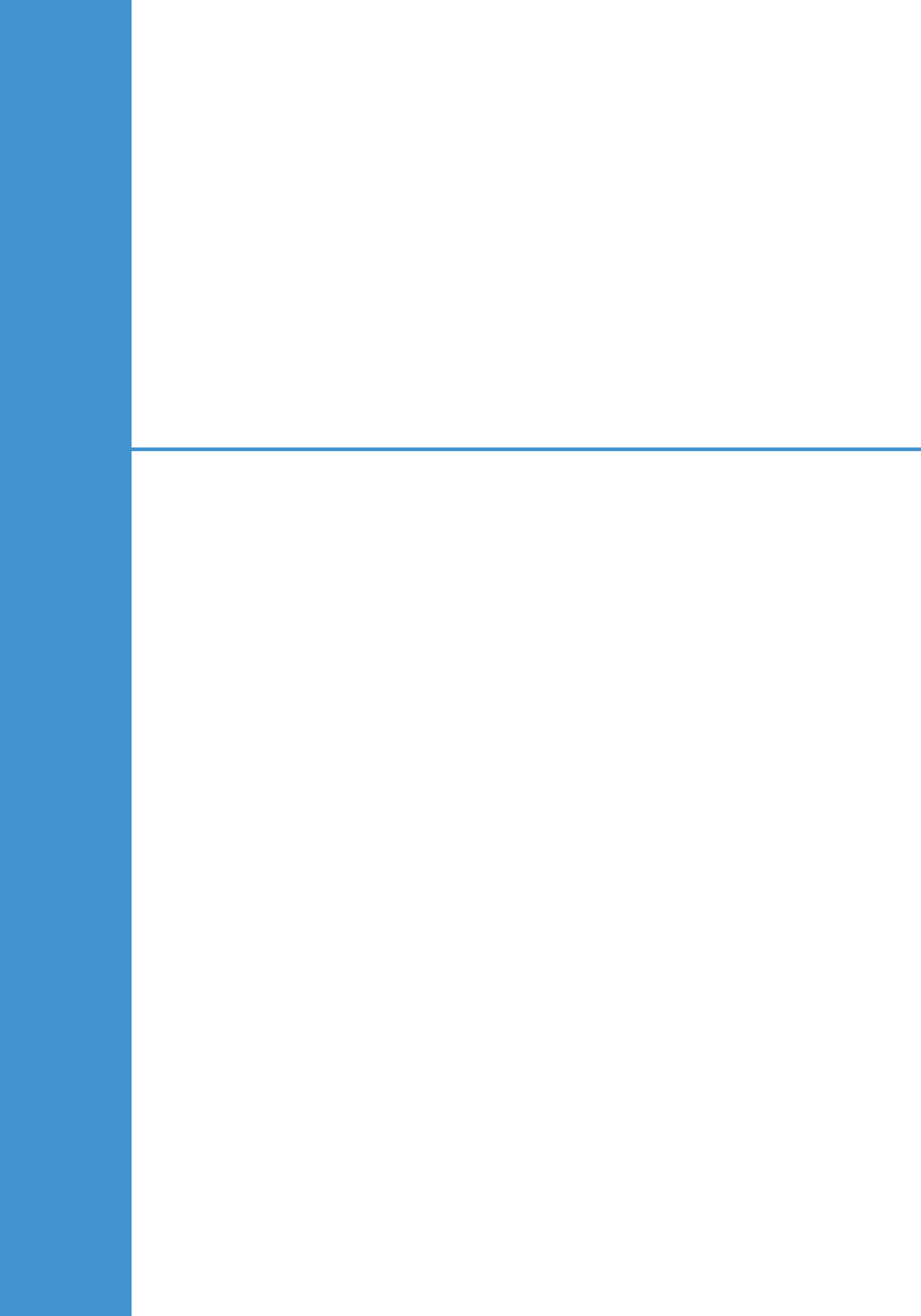
Case study 1: Education organisation

Choice of setting for case study. The setting is the biggest organisation of vocational education and training (VET) in Lithuania according to the scope of learners and the regional outspread; it is also one of the most innovative vocational schools in the country. The VET institution is certified in the International Association of Education, and the quality of its activities is evaluated according to the standard of LST EN ISO 9001: 2008.

Context of case study setting. The VET institution provides possibilities for formal vocational learning, after completing the compulsory learning programme the learners acquire a particular vocation/profession and the certificate of graduation. The VET institution implements the following activities: primary vocational teaching, basic and secondary, pre-school and adult education. The purpose of the institution is to promote the development of high level services in vocational education and training by preparing specialists for business services. The education (teaching and learning) is realised in the areas of beauty, health care, social welfare and business services according to 20 programmes of basic vocational/professional training. The human resources in VET institution include 496 staff members (344 teachers, 2 social pedagogues, 2 psychologists, 4 schoolmasters of the dormitory). Teachers are the specialists-experts in their specific activity areas, who acquired the pedagogical qualifications (or are studying the pedagogy or education) and have accumulated pedagogical, vocational/professional experience, and continuously develop their qualification. There are 18 staff members with PhD, 122 with Master, 140 with Bachelor level education in the institution, and there are 15 experts, 52 supervisors, and 72 senior teachers among them. The

VET institution substantiates its activities with particular values such as faith, hope, love, openness, responsibility, and creativity. The Institute of Vocational Innovations takes care about the establishment and support of ICT system in VET institution. The purpose of this institute is to create innovations and promote their implementation in organisations of vocational/professional training and other educational organisations. This institute is a structural part of the VET institution.

Research strategy. The research includes a quantitative design research strategy. The research was focused on revealing the reasons to integrate TEL curriculum and the analysis of TEL integration into the institution. In some summaries of specific criteria, outcomes from document analysis are also provided while this analysis is not represented specifically in the case study.

Sample. Research participants were chosen according to the activity areas of VET institution in order to manifest the maximum of areas that are related to integration of TEL into the institution. The average of work experience in VET among research participants is ten years. The work positions of research participants are the following: vice-director for research and projects (1), coordinator for marketing (1), head of the Institute of vocational/professional innovations (1), supervisor for implementation and controlling of the quality system at VET (1), head of the department for coordination of the personnel (1), and teachers (2). The total sample consisted of 7 research participants.

Tool. The basis for the assessment was the authorship and standardised methodology http://www.reviveproject.eu/vet/quality-criteria/revive-vet-curriculum-design-quality-criteria/.

In the case study, the results of TEL curriculum quality assessment are calculated according to the quality criteria. Every criterion consists of particular indicators and every indicator includes specific characteristics:

• Criterion A consists of 27 characteristics, then the possible maximum percent of every characteristic is 3.7%. The percentage of one value (0 or 1, or 2, or 3) in criterion A may collect up to maximum 0.925%.

• Criterion B consists of 31 characteristics, then the possible maximum

percent of every characteristic is 3.2%. The percentage of one value (0 or 1, or 2, or 3) in criterion B may collect up to maximum 0.8%.

• Criterion C consists of 20 characteristics, then the possible maximum percent of every characteristic is 5.0%. The percentage of one value (0 or 1, or 2, or 3) in criterion C may collect up to maximum 1.25%.

• Criterion D consists of 3 characteristics, then the possible maximum percent of every characteristic is 33.33%. The percentage of one value (0 or 1, or 2, or 3) in criterion D may collect up to maximum 8.325%.

• Criterion E consists of 10 characteristics, then the possible maximum percent of every characteristic is 10.0%. The percentage of one value (0 or 1, or 2, or 3) in criterion E may collect up to maximum 2.5%.

• Criterion F consists of 17 characteristics, then the possible maximum percent of every characteristic is 5.88%. The percentage of one value (0 or 1, or 2, or 3) in criterion F may collect up to maximum 1.47%.

• Criterion G consists of 16 characteristics, then the possible maximum percent of every characteristic is 6.25%. The percentage of one value (0 or 1, or 2, or 3) in criterion G may collect up to maximum 1.56%.

Every characteristic was assessed by research participants in the scale with particular values such as 0 – not implemented; 1 – planned, but not implemented; 2 – partly implemented and 3 – fully implemented. Research participants had a possibility to tick only one value, and they were asked not to rank the values regarding every characteristic. The percentage which is related to value 0 had to be eliminated from the total sum of percentage in every indicator. The total possible percentage in every criterion could be 100%. The percentages that are presented in tables show the values of every characteristic, which were ticked by research participants. The findings highlight the strengths or weaknesses of TEL integration into the educational organisation.

Findings. In the educational organisation, the criteria of marketing and business planning, support system for teachers and learners, and quality assurance are strongly implemented criteria regarding TEL integration into organisation.

Criterion A: Strategy and management

<u>Indicator A1: Organisational vision and aims promote innovative decisions by seeking for better organisational management and services.</u> It is evident from the findings that the integration of ICT development and quality assurance are successfully implemented in the educational organisation.

Table 26. Organisational vision and aims promote innovative decisions.

Characteristic A1.1. Innovations are the horizontal priority in organisation.	2 – implemented partly	2.78%
Characteristic A1.2. Innovative resource management in organisation is performed.	2 – implemented partly	2.78%
Characteristic A1.3. The policy of organisation supports ICT development, and internal as well as external services for this are provided.	2 – implemented partly	2.78%
Characteristic A1.4. ICT is implemented for quality improvement, but not for saving the resources.	3 – fully implemented	3.7%
Characteristic A1.5. Implementation of innovations is promoted and supported in curriculum.	2 – implemented partly	2.78
Total:		14.82%

<u>Indicator A2: the strategy of educational organisation promotes ICT integration</u>. The findings show that the personnel understand the roles and responsibilities, and the administration of organisation recognises the contribution of e-learning to community development in the education organisation. Other statements show thin the organisation must work regarding the planning of educational service transformation through e-learning and should prepare the procedures according to which the e-learning courses will be recognised.

Table 27. The strategy of educational organisation promotes ICT integration.

Characteristic A2.1. Roles and responsibilities of the staff in TEL integration are clear.	2 – implemented partly	3.7%
Characteristic A2.2. All educational services are planned to be transformed through e-learning, and this process is supported by administration of educational organisation.	1 – planned, but not implemented	2.78%
Characteristic A2.3. The organisation prepared the procedures according to which e-learning courses are recognised.	1 – planned, but not implemented	2.78%
Characteristic A2.4. E-learning strategy contributes to community development in the organisation, national and international levels.	2 – implemented partly	3.7%
Total:		12.96%

Indicator A3: The strategy of organisation provides the means for ICT integration. The findings show that the vision of the organisation does not involve ICT implementation, and the strategy of TEL implementation is planned only by the personnel.

Table 28. The strategy of organisation provides the means for ICT integration.

Characteristic A3.1. The organisation supports TEL.	2 – implemented partly	3.7%
Characteristic A3.2. The vision of the organisation involves ICT implementation.	0 – not implemented	3.7%
Characteristic A3.3. The strategy of TEL implementation is planned owing to the personnel.	1 – planned, but not implemented	1.85%
Total		5.55%

Indicator A4: The organisation prepared the tools for feedback from service consumers. This characteristic is a very weak point in the educational organisation. Monitoring is not implemented in all levels of the organisation, and the discussions with the staff regarding the issues of learning by using ICT and services of TEL are not organized.

Table 29. The organisation prepared the tools for feedback from service consumers.

Characteristic A4.1. Monitoring of TEL integration is implemented in all levels of organisation.	0 – not implemented	3.7%
Characteristic A4.2. The outcomes of research and monitoring influence and promote management practices of teaching and learning.	1 – planned, but not implemented	3.7%
Characteristic A4.3. Discussions with the staff are realised in order to show the issues which are experienced by learners in using ICT and services of TEL.	0 – not implemented	1.85%
Total:		1.85%

Indicator A5: Management of the education organisation supports TEL integration through financing and searching for practical decisions. Automatisation of processes in the education organisation is the only not implemented activity within the TEL integration into the organisation.

Table 30. Management of the education organisation supports TEL integration.

Characteristic A5.1. Every day assignments related to TEL integration and ICT implementation are performed by the staff with full load and volunteers.	2 – implemented partly	1.85%
Characteristic A5.2. Priority of the organisation is automatisation of processes.	1 – planned, but not implemented	0.925%
Characteristic A5.3. Administration of learning courses, services for customers-learners and the help provision may be performed online from home or from other settings.	2 – implemented partly	1.85%
Total		4.625%

Indicator A6: ICT-based services are developed with the focus on development of ICT skills, pedagogical decisions and respect to learner's needs, and the learning process. All the characteristics regarding the implementation of ICT-based services in TEL integration are not implemented.

Table 31. ICT–based services are developed with the focus on development of ICT skills, pedagogical decisions and respect to learner's needs, and the learning process.

Characteristic A6.1. ICT is used to increase the effectiveness of pedagogical processes: to provide the internet-based support, observe the learning environment and the learning way of the learner, change the learning environment of the consumer, and etc.	1 – planned, but not implemented	1.85%
Characteristic A6.2. The models of flexible teaching and learning are applied in the organisation by striving to fulfil the needs of learners.	1 – planned, but not implemented	1.85%
Characteristic A6.3. ICT is applied for implementation of virtual mobility.	0 – not implemented	3.7%
Total		3.7%

Indicator A7: The workload is systematically analysed and is proportional to groups of learners. The aspect of the workload regarding TEL integration is a weak point at the educational organisation.

Table 32. The workload is systematically analysed and is proportional to groups of learners.

Characteristic A7.1. New models for workload restructurisation are used in providing the TEL services.	0 – not implemented	3.7%
Characteristic A7.2. Plans for implementation of TEL services are developed for 12 months (1 year) phase.	1 – planned, but not implemented	0.925%
Characteristic A7.3. eTutors are appointed for learners regarding their learning needs.	1 – planned, but not implemented	0.925%
Total		1.85%

Indicator A8: The help for TEL service provision in different departments of the organisation is delivered. The service provision for TEL service provision is implemented partly in the education organisation.

Table 33. The help for TEL service provision in different departments of the organisation is delivered.

Characteristic A8.1. Effective and coordinated support for the development and provision of TEL services in different departments is implemented.	2 – implemented partly	1.85%
Characteristic A8.2. Continuous technical support is delivered for teachers and learners.	2 – implemented partly	1.85%
Characteristic A8.3. Technical help for the staff is assured anytime (on internet, and etc.).	2 – implemented partly	1.85%
Total		5.55%

Summary of 'Criterion A: Strategy and management' evaluation. In the strategic documents of the education organisation, the system of TEL integration is manifested. The implementation of new ICT is presumed in the strategic plan of the organisation. In this document, the core focus is on the coordination of ICT system application for knowledge dissemination and value education. The research findings show that the vision and objectives of the institution promote the innovative decisions, striving for better management and service provision in the organisation. The research outcomes showed that ICT is implemented in the education organisation for raising the quality but not for saving the resources. Criterion A has a good start in the educational organisation. For example, innovations are the horizontal priority of the institution, the innovative resource management is implemented, the organisational policy supports the ICT expansion, and the internal as well as external services are foreseen, the implementation of innovations in curriculum is promoted and supported. These aspects highlight the attitude of the staff for TEL integration into the educational organisation and describe the directions which should be planned, implemented and improved.

Criterion B. TEL curriculum.

Indicator B1: TEL implementation in the education organisation.

The findings show that TEL implementation in the education organisation is not conducted. It could be explained by the fact that employees are still not

well informed about the activities of the Institute of professional innovations. The implementation of TEL into the education organisation is carried out, but this process is detached from the qualification improvement of employees. In the documents of the Institute of professional innovations it is predicted that counselling of employees will be provided for academic and non-academic personnel.

Table 34. TEL implementation in the education organisation.

Characteristic B1.1. ICT development is planned for a long phase by providing enough time for personnel to adapt to new practices.	0 – not implemented	3.2%
Characteristic B1.2. Strategic TEL implementation is realised and is related to qualification improvement of employees.	0 – not implemented	3.2%
Characteristic B1.3. Interpersonal counselling is delivered in the organisation by involving also the non-academic employees.	0 – not implemented	3.2%
Total		0.0%

Indicator B2: The procedure for ICT infrastructure utilisation is prepared and open for employees and learners in the education organisation. The procedures regarding the use of equipment, programmes, and regarding the development and testing internet-based resources still do not exist in the education organisation.

Table 35. The procedure for ICT infrastructure utilisation is prepared and open for employees and learners in the education organisation.

Characteristic B2.1. TEL is accessible in all buildings of the educational organisation on internet from any place.	2 – implemented partly	0.8%
Characteristic B2.2. The procedure is explicit regarding the use of equipment, programmes, installation, and it is accessible to employees and learners.	0 – not implemented	3.2%
Characteristic B2.3. A precise procedure exists regarding the technological standard for ICT application in the organisation (e.g., Moodle, Google, Java, Flash)	2 – implemented partly	0.8%
Characteristic B2.4. The organisational procedure regarding development and testing of internet-based resources exits.	0 – not implemented	3.2%

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Characteristic B2.5. The validity of TEL system is assured by applying the preparation of duplicate copies.	1 – planned, but not implemented	0.8%
Total		2.4%

Indicator B3: The distance teaching and learning environment is developed and used on the internet. The education organisation lacks the descriptors for updating the distance teaching and learning environments.

Table 36. The distance teaching and learning environment is developed and used on the internet.

Characteristic B3.1. The organisation uses the only one system for distance teaching and learning.	2 – implemented partly	3.2%
Characteristic B3.2. In the organisation there are descriptors for updating distance teaching and learning environments.	0 – not implemented	3.2%
Characteristic B3.3. The organisation plans the costs for research with the focus on effectiveness and development of TEL systems.	1 – planned, but not implemented	1.6%
Total		4.8%

Indicator B4: The handbook for users of distance teaching and learning environments and other technologies are prepared and accessible to consumers. The weak points are as follows: lack of prepared manuals for every teaching subject, and not implemented monitoring regarding the data collection and analysis with the focus on learners' experiences within TEL.

Table 37. The handbook for users of distance teaching and learning environments and other technologies are prepared and accessible to consumers.

Characteristic B4.1. Handbooks for users of distance teaching and learning environments include the technological, organisational and consumer information.	2 – implemented partly	1.6%
Characteristic B4.2. Every course/subject provides the manual.	1 – planned, but not implemented	0.8%
Characteristic B4.3. Monitoring is implemented, information is collected about technologies that are used and how they are used by the consumers, and their feedback is analysed.	1 – planned, but not implemented	0.8%
Total		3.2%

Indicator B5: Video conferences and other tools are used in synchronic and asynchronic communication. The application of synchronic communication is applied insufficiently in internet-based environment of the education organisation.

Table 38. Video conferences and other tools are used in synchronic and asynchronic communication.

Characteristic B5.1. In TEL the tools for asynchronic communication are applied in internet-based environment.	2 – implemented partly	1.6%
Characteristic B5.2. In TEL the tools for synchronic communication are applied in internet-based environment.	1 – planned, but not implemented	0.8%
Characteristic B5.3. The 2.0 Web technologies are used.	2 – implemented partly	1.6%
Total		4.0%

Indicator B6: The initiatives on licenses for open content and creative communities are implemented. The explicit procedures and strategies regarding use, adaptation and change of open educational resources, the implementation of open code technologies on computers and mobile equipments, and different operational systems existing in the organisations still do not exist in the education organisation.

Table 39. The initiatives on licenses for open content and creative communities are implemented.

Characteristic B6.1. Explicit procedure on use, adaptation and change of open educational resources exists in the organisation.	0 – not implemented	3.2%
Characteristic B6.2. Explicit procedure on implementation of open code technologies on computers and mobile equipments, and different operational systems, exists in the organisation.	0 – not implemented	3.2%
Characteristic B6.3. Explicit strategy for gradual implementation of open code technologies, computers and mobile equipments, and different operational systems, exists in the organisation.	0 – not implemented	3.2%
Characteristic B6.4. Explicit procedures for licensing in the use of creative communities at any time exist in the organisation.	2 – implemented partly	1.6%
Total		1.6%

Indicator B7: ICT and TEL–based decisions are managed and coordinated by one department through performing the functions of support and maintenance. The decisions regarding the programmes and descriptors of procedures regarding TEL integration are not implemented in the education organisation. Also the monitoring of learning resources is not realised while integrating the TEL into the education organisation.

Table 40. ICT and TEL–based decisions are managed and coordinated by one department through performing the functions of support and maintenance.

Characteristic B7.1. Institutional procedure regarding the provision of centralised services exists in the organisation.	2 – implemented partly	1.6%
Characteristic B7.2. The department which provides centralised services for all other institutional departments has adequate human and technological resources.	2 – implemented partly	1.6%
Characteristic B7.3. The programme for safety, descriptors of procedures exists and is applied in the organisation.	0 – not implemented	3.2%
Characteristic B7.4. Monitoring for learning resources is realised.	1 – planned, but not implemented	0.8%
Total		4.0%

Indicator B8: The systems for student admission and academic data are fully integrated into the distance teaching and learning environment. The administration of student or learners' (employees) affairs, the qualification improvement of the personnel is integrated within TEL into the education organisation.

Table 41. The systems for student admission and academic data are fully integrated into the distance teaching and learning environment.

Characteristic B8.1. Administration of student affairs is fully integrated.	2 – implemented partly	3.2%
Characteristic B8.2. Administration of all learners in distance teaching and learning environment is fully functional.	2 – implemented partly	3.2%
Characteristic B8.3. In the distance teaching and learning environment the employees' qualification improvement is integrated.	2 – implemented partly	3.2%
Total		9.6%

Indicator B9: The automatised access to library resources, data bases and journals is implemented. The library resources, internet-based journals, scientific international data bases are still not accessible to all learners and employees in the education organisation.

Table 42. The automatised access to library resources, data bases and journals is implemented.

Characteristic B9.1. Library resources are accessible to all learners and employees.	1 – planned, but not implemented	0.8%
Characteristic B9.2. Internet-based journals are available for all learners and employees.	1 – planned, but not implemented	0.8%
Characteristic B9.3. Internet-based data bases of the research literature are accessible to all learners and employees.	1 – planned, but not implemented	0.8%
Total		2.4%

Summary of 'Criterion B: TEL curriculum' evaluation. TEL integration into the education organisation is in the start position. The Institute of professional innovations is responsible for TEL integration and the activities of this institution foresee the counselling of the employees, which include academic and non-academic personnel. Document analysis revealed that procedure regarding the distance teaching and learning is prepared here. However, the dissemination of information on distance teaching and learning, and technological innovations is provided through employees who work in different departments of the education organisation. This fact aggravates the effectiveness of information dissemination within TEL integration.

Criterion C: ICT infrastructure

Indicator C1: Strategy for subject/programme evaluation. The provision of the description regarding the strategy for subject/programme evaluation is the strongest aspect in the education organisation within TEL integration.

Table 43. The automatised access to library resources, data bases and journals is implemented.

Characteristic C1.1. The strategy for subject/programme evaluation is provided clearly in description.	2 – implemented partly	2.50%
Characteristic C1.2. Evaluation criteria are explicitly measured and apprehensible (the weight of criteria is provided in common evaluation system).	2 – implemented partly	3.2%
Characteristic C1.3. Learners have a possibility to discuss the evaluation strategy and to recommend its improvements.	2 – implemented partly	3.2%
Characteristic C1.4. Metacognitive tools are applied in curriculum for evaluation of personal progress.	2 – implemented partly	3.2%
Characteristic C1.5. Tools for self-examination are used.	2 – implemented partly	3.2%
Characteristic C1.6. Feedback is applied and the discussion on learning outcomes is organised.	2 – implemented partly	3.2%
Characteristic C1.7. The system of portfolio is used and the performed assignments may be exported after finishing the learning process.	2 – implemented partly	3.2%
Characteristic C1.8. Variety of evaluation strategies, tools and assignments are used for assessment of learning outcomes.	2 – implemented partly	3.2%
Total		24.9%

Indicator C2: Open educational resources are used in the curriculum and the learners are promoted to use them. Open educational resources are not used in the curriculum in formats of multiple medium in the education organisation.

Table 44. Open educational resources are used in the curriculum and the learners are promoted to use them.

Characteristic C2.1. The open educational resources are used in curriculum in formats of multiple medium.	2 – implemented partly	3.2%
Characteristic C2.2. Learners are promoted to search and use the open educational resources with respect to their rights for utilisation.	2 – implemented partly	2.5%
Characteristic C2.3. The rights for authorship and utilisation are provided explicitly.	2 – implemented partly	2.5%
Total		8.2%

Indicator C3: The description of the task is explicit and accurate. The provision of evaluation or assessment criteria in the descriptions of every learning task, while integrating TEL into the education organisation, is implemented insufficiently.

Table 45. The description of the task is explicit and accurate.

Characteristic C3.1. Learning aims match the learning outcomes and are provided in the description of every task.	2 – implemented partly	2.5%
Characteristic C3.2. Steps for task performance are provided in every assignment.	2 – implemented partly	2.5%
Characteristic C3.3. Tools are recommended for assignment performance in the description of the task.	2 – implemented partly	1.25%
Characteristic C3.4. Evaluation criteria are provided in description of every task	2 – implemented partly	3.2%
Characteristic C3.5. Description of the assignment result and the period of its performance is provided in the description of the task.	2 – implemented partly	1.25%
Total		10.7%

Indicator C4: The experimental validity is assured (relationship with the world of activity or work). The development of learners' skills, application of learning results in real world situations, and the organisation of meetings, consultations, interviews within the relationship between the employers and employees should be improved in the education organisation within the TEL integration.

Table 46. The experimental validity is assured (relationship with the world of activity or work).

Characteristic C4.1. Tasks are related to professional activities and application of learning outcomes in practices.	2 – implemented partly	3.2%
Characteristic C4.2. The professional/practical skills of learners are developed in performance of tasks and they are promoted to apply the learning results in life-related situations.	2 – implemented partly	1.25%
Characteristic C4.3. Consultations, interviews and virtual meetings are organised with employers and business representatives.	2 – implemented partly	2.5%
Characteristic C4.4. Practical tasks are related to real world situations and promote the research, and employer and employee information collection and analysis	2 – implemented partly	3.2%
Total		10.15%

Summary of 'Criterion C: ICT infrastructure' evaluation. The evaluation of indicator C revealed the aspects that are related to distance teaching and

learning description, and the possibilities to teach according to it. In the description of the teaching and learning material, the structure of distance teaching organisation should be clearly explained by providing the scope of studies in academic hours/credits, schedule of educational occupations, tasks and the percent of distance education. The findings show that this criterion is implemented partly: there is lack of clarity and assessment clearness, feedback, and the learners are partly promoted to search for learning information, to use the open educational resources by respecting their rights of utilisation.

Criterion D: Continuing professional staff development

Indicator D1: ICT competencies of academic personnel. The possibilities for employees to improve their didactic and ICT competencies, and strengthen their counselling process.

Table 47. ICT competencies of academic personnel.

Characteristic D1.1. Strategic decisions regarding e-learning are related to improvement of ICT skills of employees.	3 – implemented fully	33.33%
Characteristic D1.2. Employees have a possibility to improve their didactic and technological skills in tuition-free courses.	2 – implemented partly	16.67%
Characteristic D1.3. Personal teaching and counselling of employees is provided.	2 – implemented partly	16.67%
Total		66.67%

Summary of 'Criterion D: Continuing professional staff development' evaluation. While the documents of education organisation accentuate the importance of the personnel competence development, the attention to this aspect is paid insufficiently. The strategic decisions of e-learning lack relations to the real situation of development of ICT employees' competence.

Criterion E: Support systems

Indicator E1: The support system for learners. The actual issue in the education organisation is the regulation of workload among employees and its correlation with the support system.

Table 48. The support system for learners.

Characteristic E1.1. Learners make decisions regarding their learning pace.	3 – implemented fully	7.5%
Characteristic E1.2. Internet-based administrational procedures for admission of learners are implemented.	2 – implemented partly	5.0%
Characteristic E1.3. Workload of employees is regulated according to limitations of support system.	0 – not implemented	10.0%
Characteristic E1.4. Organisation provides services for employee's ICT competence improvement in order to assure the acquisition of compulsory ICT competencies for successful TEL integration.	2 – implemented partly	5.0%
Characteristic E1.5. Learners have access to a variety of communication resources and tools.	3 – implemented fully	2.5%
Characteristic E1.6. Individual support for learner is implemented.	1 – planned, but not implemented	1.67%
Characteristic E1.7. Support services and tools for the disabled people are implemented.	1 – planned, but not implemented	1.67%
Total		23.34%

Indicator E2: The ICT competencies in the institution. The improvement of employees' qualification and involvement of non-academic personnel must be more effective.

Table 49. The ICT competencies in the institution.

Characteristic E2.1. ICT development is planned for a long-term by providing enough time for employees to adapt to new practices	3 – implemented fully	10.0%
Characteristic E2.2. Strategic TEL integration is placed and is related to improvement of employee qualifications.	2 – implemented partly	7.0%
Characteristic E2.3. Interpersonal counselling in the organisation is performed and non-academic personnel are integrated into this process.	2 – implemented partly	7.0%
Total		24.0%

Summary of 'Criterion E: Support systems' evaluation. The findings show that this criterion is implemented effectively. Taking into account that the Institute of professional innovations started its activities only in 2014,

and there was the period of the 'start' position of this subdivision at the time of the study, then it could be summarised that the implementation of the support system for teachers and learners is assured in the educational organisation.

Criterion F: Quality assurance proceedures

Indicator F1: Institutional procedures for quality assurance and certification of TEL curriculum. The quality assurance procedures in the educational organisation are implemented successfully

Table 50. Institutional procedures for quality assurance and certification of TEL curriculum.

Characteristic F1.1. Self-assessment/analysis has its specific tasks.	3 – implemented fully	4.12%
Characteristic F1.2. Learning courses are systematically evaluated by independent experts regarding content and didactics.	3 – implemented fully	4.12%
Characteristic F1.3. Internal assessment of the learning course is performed prior to its provision in internet space.	3 – implemented fully	4.12%
Characteristic F1.4. Specific methodology is used for learning course assessments.	3 – implemented fully	4.12%
Characteristic F1.5. Assessment of the learning course is assumption to renew its planning.	3 – implemented fully	4.12%
Characteristic F1.6. Quality assurance is the horizontal priority at the institution.	3 – implemented fully	4.12%
Characteristic F1.7. The expert group for ICT and TEL assessment is established at the institution.	3 – implemented fully	4.12%
Total		28.84%

Indicator F2: The internal and external evaluation/assessment of TEL in the institution. The internal and external assessment is implemented quite effectively.

Table 51. The internal and external evaluation/assessment of TEL in the institution

Characteristic F2.1. The internal and external assessment is used for TEL at the institution.	3 – implemented fully	2.94%
Characteristic F2.2. Every learner evaluates the course at the end of learning.	3 – implemented fully	2.94%
Characteristic F2.3. Professional accreditation assures the quality.	3 – implemented fully	2.94%
Characteristic F2.4. Business representatives participate in the assessment/ evaluation of the course.	3 – implemented fully	2.94%
Total		11.76%

Indicator F3: ICT decisions are implemented within the process of quality assurance.

Table 52. ICT decisions are implemented within the process of quality assurance.

Characteristic F3.1. The institution uses the internet-based questioning surveys, discussions for the self-analysis/assessment and evaluation of quality assurance	3 – implemented fully	5.88%
Characteristic F3.2. The quality assurance of ICT is the integral part of the institutional quality assurance system	3 – implemented fully	5.88%
Characteristic F3.3. The feedback forms in the distance teaching and learning environment are provided for evaluation of technical tools	3 – implemented fully	5.88%
Total		17.64%

Indicator F4: Management of complaints. The management of complaints is a very weak side in the educational organisation within the TEL integration.

Table 53. Management of complaints.

Characteristic F4.1. Tools and procedures for decision-making when receiving complaints from learners are prepared.	0 – not implemented	5.88%
Characteristic F4.2. Tools and procedures for decision-making when receiving complaints from employees are prepared.	0 – not implemented	5.88%
Characteristic F4.3. Monitoring and decision-making regarding complaints are placed permanently and systematically.	0 – not implemented	5.88%
Total		0.0%

Summary of 'Criterion F: Quality assurance proceedures' evaluation. The findings show that the system of quality assurance works effectively enough in the education organisation. Having performed the document analysis, it was found that the documentation is systematised and registered, and the administration works with the specialised and computerised programmes. The saving of the data is realised in the server of the specific IT system. The institutional procedures for quality assurance in the education organisation are the strength of the organisation. Nevertheless, the complaints in the education organisation are not administered and managed. It shows that the institution still does not see it as an issue. The findings also show that the tools and procedures for management of learners' complaints, used in the education organisation, are not transparent enough, and the monitoring of the complaints is not realised in the education organisation.

Criterion G: Marketing and business

Indicator G1: Administration of TEL. Only the documentation is prepared for TEL marketing in the education organisation. But the managerial, administrational and human resource-based tools are not implemented.

Table 54. Administration of TEL.

Characteristic G1.1. Marketing and business plans are prepared in the institution.	3 – implemented fully	5.63%
Characteristic G1.2. Policy of TEL publicity is pursued in the institution.	0 – not implemented	6.25%
Characteristic G1.3. Strategy is pursued and the tools are prepared to ensure accessibility of variety of potential consumers.	0 – not implemented	6.25%
Characteristic G1.4. Specific budget is provided for TEL marketing.	0 – not implemented	6.25%
Characteristic G1.5. Specific strategy is provided to generate to marketing resources.	0 – not implemented	6.25%
Characteristic G1.6. Specific expert group is responsible for TEL marketing in the institution.	0 – not implemented	6.25%
Characteristic G1.7. Monitoring of TEL marketing is realised permanently.	0 – not implemented	6.25%
Total		5.63%

Indicator G2: Orientation to business. The orientation to business within TEL integration is a very weak point.

Table 55. Orientation to business.

Characteristic G2.1. Flexibility is the general strategy for TEL services.	0 – not implemented	6.25%
Characteristic G2.2. Learning courses and programmes are permanently renewed in regard to needs of marketing.	0 – not implemented	6.25%
Characteristic G2.3. Diversification is an important part of marketing in provision of TEL services.	0 – not implemented	6.25%
Total		0.0%

Indicator G3: Effectiveness of costs. The findings show that the education organisation does not care much about the effectiveness of costs regarding the TEL integration into the organisation.

Table 56. Effectiveness of costs.

Characteristic G3.1. Business models and market prognoses are used in the institution.	0 – not implemented	6.25%
Characteristic G3.2. Teachers are paid according to the number of learners, but not according to the number of learning courses.	0 – not implemented	6.25%
Characteristic G3.3. The institution makes the financial and administrational agreements for keeping the TEL programmes, provides the support for employees and learners by ensuring the effective learning environment and its maintenance.	0 – not implemented	6.25%
Total		0.0%

Indicator G4: Prognosis of incomes. The results show that the education organisation does not relate its income with the TEL integration into the organisation.

Table 57. Prognosis of incomes.

Characteristic G4.1. TEL services are an important resource of income.	0 – not implemented	6.25%
Characteristic G4.2. ICT-based counselling for other institutions is an important resource of income.	0 – not implemented	6.25%
Characteristic G4.3. The institution uses the financial prognoses.	0 – not implemented	6.25%
Total		0.0%

Summary of 'Criterion G: Marketing and business' evaluation. The results reveal that marketing and business planning is a very weak point in the activities of TEL integration into the education organisation: the policy of TEL publicity is not pursued in the institution, the strategy is not pursued and the tools are not prepared to ensure the accessibility of a variety of potential consumers, the specific budget is not provided for TEL marketing, the specific strategy is not provided to generate marketing resources regarding TEL integration into the organisation, the specific expert group is not established for TEL marketing in the institution, the monitoring of TEL marketing is not realised. Orientation to business regarding the TEL integration into the education organisation needs to focus on flexibility as the general strategy for provision of TEL services, the learning programmes should be permanently renewed in regard to the needs of marketing. Effectiveness of costs should be planned and managed within the TEL integration into the organisation. The findings show that business models are not used, teachers are not paid according to the number of learners, and the institution does not make the financial and administrative agreement for keeping the TEL programmes. TEL integration and TEL services are not seen as a strategically important point regarding income through the activities of education organisation. Here is still lack of ICT-based counselling for other institutions and use of the financial prognoses while integrating TEL into the education organisation.

Summary. The findings reveal that TEL integration into the educational organisation is limited according to all seven criteria. The strongest side of TEL integration into the education organisation is continuing professional development, quality assurance and resources. The marketing and business

planning are the weakest side of TEL integration into the education organisation. Other criteria such as strategy and management, curriculum and didactics, support system for teachers and learners had a good start and are developed with full potential in the education organisation.

Table 58. Criteria groups.

Criteria groups	Collected total %
A. Strategy and management	Collected: 47.21%
B. Curriculum and didactics	Collected: 45.6%
C. Resources	Collected: 53.95%
D. Continuing professional staff development	Collected: 66.67%
E. Support systems for teachers and learners	Collected: 47.34%
F. Quality assurance procedures	Collected: 58.24%
G. Marketing and business planning	Collected: 5.63%

Recommendations reflect the specific aspects that must be ensured while implementing the TEL into the organisation. Specific recommendations regarding every criterion are provided below.

For successful implementation of *Criterion A: Strategy and management,* the educational organisation should strengthen the following activities:

• Planning all the educational services in order to transform it through e-learning; and this process must be supported by the administration of the educational organisation.

• Preparing the procedures according to which the e-learning courses are recognised in the educational organisation.

• Involving the ICT implementation into the vision of the educational organisation.

• Planning the strategy of TEL implementation by recognising the competence of employees.

• Implementing the monitoring of TEL integration in all levels of the educational organisation.

• Recognising the influence of research, and monitoring for promotion and management of teaching and learning.

• Providing the discussions with the staff in order to show the issues which are experienced by learners in using ICT and the TEL services.

• Making the automatisation of processes one of the priorities at the educational organisation.

• Using the ICT to increase the effectiveness of pedagogical processes: to provide the internet-based support, observing the learning environment and the learner's style of learning, changing the learning environment of the consumer, and etc.

• Applying models of flexible teaching and learning in the organisation by striving to fulfil the needs of learners.

• Applying the ICT for implementation of virtual mobility.

• Using new models for workload restructurisation in providing the TEL services.

• Developing plans for implementation of TEL services in 1 year phase.

• Appointing eTutors for learners regarding their learning needs.

The effective implementation of *Criterion B: TEL curriculum* in the educational organisation is related to these characteristics:

• Planning the ICT development for a long-term period by providing enough time for personnel to adapt to the new practices.

• Implementing the TEL strategically and relating it to qualification improvement of employees.

• Delivering the interpersonal counselling in the organisation by involving the non-academic personnel.

• Making the procedure explicit regarding the use of equipment, programmes and installation, and making it accessible to employees and learners.

• Establishing the organisational procedure regarding development, and testing of internet-based resources.

• Assuring the validity of TEL system by applying the preparation of duplicate copies.

• Preparing the descriptors for updating the distance teaching and learning environments in the organisation.

• Planning the costs for research with the focus on effectiveness and development of TEL systems in the organisation.

• Providing the manual for every course/subject.

• Implementing monitoring and collecting information about technologies that are used and how they are used by the consumers, and analysing their feedback.

• Applying the tools for synchronic communication in internet-based environment.

• Preparing the explicit procedure on use, adaptation and change of open educational resources in the organisation.

• Preparing the explicit procedure on implementation of open code technologies on computers and mobile equipment, and different operational systems in the organisation.

• Preparing the explicit strategy for gradual implementation of open code technologies, computers and mobile equipments, and different operational systems in the organisation.

• Preparing the programme for safety, descriptors of procedures and applying it in the organisation.

• Providing the monitoring for learning resources.

• Making the library resources, internet-based journals and international data bases accessible to all learners and employees.

The meaningful implementation of *Criterion C: ICT infrastructure* is dependent on these aspects:

• Provision of the strategy for subject/programme evaluation in the description of the organisation.

• Promotion of learners to search and use the open educational resources with respect to their rights for utilisation.

• Provision of the rights for authorship and utilisation.

• Recommendation of the tools for assignment performance in the description of the learning task.

• Aiming to match the learning aims and outcomes and providing them in the description of every learning task.

• Provision of steps for learning task performance in every assignment.

• Provision of the explanation regarding the assignment result and the period of its performance in the description of the learning task.

• Developing the practical skills of learners in performing the learning tasks and promoting the application of learning results in life-related situations.

• Organisation of consultations, interviews and virtual meetings for learners, teachers and employees.

The conducting of *Criterion D: Continuing professional staff development* correlates with the following activities:

• Employees have a possibility to improve their didactic and technological skills in tuition-free courses while integrating TEL into the organisation.

• The personal teaching and counselling of employees is provided while integrating TEL into the organisation.

The execution of *Criterion E: Support systems* is dependent on these activity components:

• Regulation of the workload of employees according to limitations of support system.

• Implementation of the individual support for learners.

• Implementation of the support services and tools for the disabled people.

• Placing the strategic TEL integration and relating them to improvement of employees' qualification.

• Performance of the interpersonal counselling and integration of non-academic personnel into this process.

The implementation of *Criterion F: Quality assurance proceedures* is attached to the following activities:

• Preparation of the tools and procedures for decision-making when receiving complaints from learners and employees.

• Placing the monitoring and decision-making regarding complaints permanently and systematically in the organisation.

The realisation of *Criterion G: Marketing and business* is related to these characteristics:

• Pursuance of the policy of TEL publicity in the organisation.

• Pursuance of the strategy and preparation of the tools to ensure the accessibility of variety of potential consumers.

• Provision of the specific budget for TEL marketing in the organisation.

• Provision of the specific strategy to generate the marketing resources.

• Establishment of the specific expert group which is responsible for TEL marketing in the organisation.

• Permanent realisation of the monitoring of TEL marketing in the organisation.

• Taking into account that flexibility is the general strategy for TEL services in the organisation.

• Renewing the training courses and programmes permanently in regard to needs of marketing.

• Use of the business models and market prognoses in the organisation within TEL integration.

• Making the financial and administrational agreements for keeping the TEL programmes, providing the support for employees and learners by ensuring the effective learning environment and its maintenance.

• Seeing the TEL services as an important resource of income in the organisation.

• Recognising the ICT-based counselling for other institutions as an important resource of income in the organisation.

• Using the financial prognoses while integrating TEL into the organisation and during its implementation as well.

Case study 2: Business organisation

Choice of setting for case study. The IT business organisation with 16 years of experience in the market was chosen for the case study. This company is the leader in Lithuania regarding IT technologies, and since 2008 the System for Quality Management has been implemented there, which corresponds to the requirements of the standard LST EN ISO 9001:2008. In 2013, when the System of Environment and Information Safety Management was implemented in the organisation, the System of Quality Management was revised and the aspects of environment and informational safety were included. Since 2014, the System of Integrated Management has been implemented in the company, which relates to aspects for quality, environmental and informational safety,

and corresponds to the requirements of the standards such as LST EN ISO 9001:2008, LST EN ISO 14001:2005 and LST ISO/IEC 27001:2006.

Context of case study setting. Fewer than 250 employees work in the company. The business organisation participates actively in research activities that are financed by the European Union programmes. Research activities motivate the employees and employers to improve their activities, develop new production and make innovative decisions. The company has two offices in Kaunas and Vilnius, where more than 50 employees work who are competent in a variety of specialties such as system analytics, programmers, specialists in quality assurance and documentation, system engineers, data operators, project managers, teachers, specialists in economics and law, and etc. The company permanently expands its activities and enrols new employees for work in full load. New employees are also enrolled on a temporary basis for specific activities in particular projects. During the 16 years, the company has implemented IT projects in Africa, Central America, Asia and a variety of European regions.

The services of the business organisation are focused on the following activities:

• IT analysis, design, quality assurance, preparation of the documentation and system implementation;

• Monitoring and development of designed IT systems;

• ICT training for specialised IT system consumers and general users, and testing of their knowledge levels.

The Training centre of the company is very experienced in organising the IT and ICT skill development courses. This centre is certified by ECDL and is involved into the list of qualification improvement institutions for civil servants, and a lot of public institutions, budget offices and private companies have been the participants in trainings organized by the business organisation, which was chosen for this case study. Highly qualified teachers work at the Training centre, which is supported by innovative ICT tools, innovative learning spaces. The Training centre developed the distance learning system, which is used in various training courses and learning processes. Learners may access the trainings on internet from any place which is comfortable for them. The distance learning system helps the

learners to acquire knowledge and skills. The Training centre provides the learning materials for every learner.

Research strategy. The research includes a quantitative and qualitative, i.e. mixed design research strategy. The experience with the fist case of the educational organisation showed that the quantitative component in such a small sample is not so important and is not meaningful, then the individual semi-structured interviews with every research participant were performed and their description is presented in the parameter of 'Findings'. The interview tool was used the same as in the case study with the educational organisation, but the research participants had a possibility to freely discuss every criterion and its characteristics. Also the documentation of the company was analysed and some important information is also provided in the findings. Then the text is presented as a description and every criterion with its characteristics is discussed with the focus on the specificity of the business organisation.

Sample. The sample consisted of five employees, such as an auditor, teacher, engineer, project manager and IT specialist.

Tool. The basis for the assessment was the authorship and standardised methodology http://www.reviveproject.eu/vet/quality-criteria/revive-vet-curriculum-design-quality-criteria/. The specific description is presented in the case of the educational organisation.

Findings. In the business organisation, the criteria of strategy and management, quality assurance, resources and continuous vocational education and skill development are implemented effectively.

Criterion A: Strategy and management

The business organisation provided activity directions in its strategic objectives, which promote the ICT literacy and new learning methods of the personnel. The CEO (chief executive officer) of the business organisation is committed to permanently develop the qualification of employees and raise their knowledge about management systems, technologies owing to internal and external education and technology-based partnership. The business organisation has no autonomous or separate teaching and learning strategy, because educational activities are not its general practice. Nevertheless, all

educational processes and procedures regarding the realisation of teaching production for clients are integrated into the common strategy of the organisation. It is the responsibility of the Department of Quality Assurance and Education.

The Quality Assurance System and certificates for safety and environment are implemented at the business organisation. It means that the systems that are permanently improved and audited are implemented in the organisation. These aspects assure the competitiveness of the organisation in the market. Because of these certificates, the business organisation may permanently create and use innovations that are the horizontal priority at the business organisation. The implementation of certificates for quality and environment obligate the organisation to review the general and resource management and to optimise it. Specific computer-based software regarding the management of physical and human resources is implemented in the organisation for innovative resource management. The partial auditing of the company is performed annually, and every two years the recertification auditing is realised in the organisation, when all the company is inspected. Procedures, publications, and the content of educational activities are systematically changed and updated at the business organisation. Also the inscriptions of recommendations in the register and notes of auditors are checked, and the processes and procedures according to them are changed.

The strategy of the business organisation is oriented to cooperation with a variety of life-long learning groups, which have different workloads and are settled in different settings and/or places. The CEO supports the distance learning of the employees and their participation in professional learning networks. The research participants noted that "TEL is cheaper than traditional teaching and learning". Furthermore, the implementation of the strategy owing to the employees is supported by the company.

The business organisation has separate orders (processes and procedures) regarding the integration of ICT into everyday activities. For the personnel from the Department of Quality Assurance and Education, the requirements for organisation of teaching, learning, courses and their design are explicit. The internal training is also organised by the administration staff, which not always knows all these requirements and the novelties.

The roles and responsibilities of employees and learners in the TEL integration process are clear and conveyed transparently. These aspects are described in the manual of Management System and regulated in descriptions of specific processes, for example, the description of "Realisation of training products".

Although the institutional strategy and the administration of the company support e-learning, distance learning and learning on the internet, but for the business organisation to transform all the educational services into e-learning format is impossible. For example, the distance examination in a lot of ICT training is impossible. Furthermore, here are specific IT certificates which prohibit the autonomous studies and learners must participate in trainings face-to-face.

The business organisation has no specific order which regulates the recognition of all e-learning courses. If the courses are organised for clients, then the recognition is assured by the "Learning procedure". But the internal training for employees of the business organisation is not included into this procedure and the recognition procedure for such a kind of internal training is not prepared.

E-learning strategy contributes to the community development at the business organisation. Employees share the learning materials and information from various courses in a friendly manner. A special catalogue is placed onto the intranet of the business organisation, and employees may find there the workshop materials, references, and etc.

Tools and procedures are prepared at the business organisation, and they are focused on the feedback from the consumers. Monitoring is very important for quality assurance, so it is performed on all organisational levels. Training participants fill in the evaluation questionnaires regarding the attended courses, participate in discussions and interviews. The feedback is also collected in non-formal environment. Employees are surveyed rarely; therefore, the information is limited regarding the use of ICT and TEL services. Sometimes the procedure of questioning is performed by the institutional auditor.

The case study organisation is focused on ICT activities, then the implementation of ICT is realised by all employees who work in the business

organisation in full time. The same employees and the volunteers (employees who are not obliged to do it unless they want) participate in internal projects of the company. The employees also want to participate in the improvement processes. The workload is added, and the hours of volunteering are also written in the specific software.

The work could be performed not only at the work place, but also using the intranet or internet (service and help for clients). The workload is not reduced if employees improve their qualification and aim at receiving the certificate. The qualification improvement could be executed after work, for example, on weekends or in the evenings after work. Also the workload of the employee is not related to the group size. Usually all trainings are planned beforehand, and the training plans are designed for one year phase.

The company uses ICT to raise the effectiveness of pedagogical processes and as a possibility to access the training from any place. Trainings are provided by using video conferences, because employees and clients work in different cities or even countries. Accordingly, flexible teaching and learning models, and virtual mobility are applied in order to satisfy the needs of learners.

The common system of technical support/help is implemented in the company. Furthermore, in different departments of the business organisation, permanent technical help is provided regarding the provision of TEL services. In most cases the head of every department or in some cases a specific specialist may be responsible for the provision of such help.

Criterion B: TEL curriculum

The company collaborates with higher education institutions from Lithuania and Europe in a variety of projects, and the employees acquire experience in the development and designing of the programmes and courses. Learning aims and goals are based on competencies, and learners may assess possibilities to achieve them. If the training is external, then the learner must receive a formal certificate. If the training is internal, then at a time of auditing, it is checked how the employee knows the procedures and performs the tasks.

The company collects the basis of employees' CVs. A specific software is established for CV enrolment and filling in. A special procedure regulates that after completion of the training course, the person fills in the course-related information, data about the received certificates and their copies into the personal data base.

In the curriculum realisation, open educational resources are used in the formats of multifaceted medium. Employees use the services of Wikipedia, Youtube, and etc. The CEO promotes the use of open educational resources and their sharing among employees. A special catalogue is placed on the intranet, into which employees may load the information and references that are related to knowledge-sharing.

The quality management system at the business organisation requires that the referencing in the training process and knowledge sharing processes would be related to authorship and copyright.

Every training course is offered to the client and is agreed with him/her in order for the educational process to match the needs of clients. In such cases, the providers of the training courses have to learn about the specificity of the companies or institutions where the clients work, in order to be capable to design the tasks that are related to the clients' professional activities, and to ensure that the learning outcomes are applied in practices. Consultations and discussion groups (meetings) with the employers or business representatives are organised during the time of trainings.

Navigation, references and external resources are explicit and provided correctly in every training course. Here the elements of design are also developed and applied. The information of the courses does not require specific software and is often provided in pdf format or could be accessed on internet. All the training materials could be delivered by e-tools. Every training participant may join the course by typing his/her user name and password. Specific groups are designed and attached to every specific training course to prevent the strangers from accessing the information.

Tools for assessment/evaluation and feedback are planned, but not implemented yet. The feedback is provided by e-mail and the standardised function of virtual learning environment is not used. A short glossary is used

in the learning system, but it is not related to the terminology which is used in the training courses. The training courses are not recorded.

When the new information, courses, materials regarding the training are presented in the system, the learners are immediately informed about it by e-mail in order to be able to start the learning process as soon as possible. The learners also receive the information on where to find the materials and information, what kind of software they need, and where to find the specific software, how to access it and install.

Experienced specialists work at the Department of training and the learning workload in their designed courses is consistent and adequate to the needs of the group of learners. Also the specialists strive not to overload the training materials with a variety of multifaceted media elements. The scope of illustrations, such as figures, pictures, video and audio materials, is adequate to the learning needs of the group. All the learning materials are adapted for individual and group learning. Learners are informed which learning materials are compulsory and which are additional. All the training materials are systematised and presented in separate parts according to the formal procedures of the business organisation. In the company, the electronic manual for documentation and quality manual are used and it is described there what, where and when could be found. All the learning materials are presented according to the requirements of authorship and copyright, and this is regulated by the institutional system of quality management.

Every course is supervised by the tutor, who provides the educational help for learners. The head of the project can also help here. The company does not provide training in which the curriculum and learning workload is based on ECTS (European Credit Transfer and Accumulation System) or competencies. Every learner receives a schedule of workshops, consultations and assignments. Feedback for learners is provided permanently.

Teachers and learners are not motivated to present themselves by using different IT tools. The message system is installed on the company's intranet and every learner and employee can provide the message, which will be seen to all company employees. The synchronic and asynchronic communication tools are used actively among employees at the business organisation.

Criterion C: ICT infrastructure

Almost all information in the company is stored in its servers, and the information is permanently accessible to all employees on intranet and internet. Learners may learn and access the information when they are in the organisation or when they are at home via internet.

The company is focused on system safety, validity and accessibility. The specific IT are used for information safety. The system is permanently checked by competent specialists.

A clear order exists at the business organisation and the learners and employees are informed how they can use the equipment, programmes, and installations. This is the requirement of the quality management standards at the business organisation.

In the company there is no particular order on the technological standard regarding the use of ICT, for example, Moodle, Google, Java, Flash, and etc., because the organisation strives to satisfy various needs of various learners and does not want to be attached to a single standard.

The procedure for the Establishment of IT systems is implemented in the business organisation. This procedure describes the procedures for designing and testing the internet resources.

The distance learning system is established and used in the company. The Quality management system of the business organisation foresees the procedures for updating the learning environment and requires that learning materials be updated constantly, and all consumers be informed about these information updating.

Effectiveness and development of TEL systems are not appropriate, and the costs for these activities are not planned. But research participants indicate that this is important to do, because the learning needs, quality and effectiveness of the system must be analysed. Such information would be important to rethink the development possibilities and the need of the TEL system.

The business organisation has no manuals designed for distance learning environments and other technologies that are accessible to consumers. The research respondents consider that the employee who creates the distance learning environment works in the company, and it is more convenient to

receive the information directly from the concrete employee. The employees of the company think the organisation is very advanced, and they really do not need manuals for consumers. But employers expressed a different opinion considering that it is important to design such manuals in the future, because the employee may leave the company and then the institution will experience problems in this sphere. The costs for the manual designing are not planned.

The company does not implement the initiatives regarding open learning curriculum or content and the common creative licences. Also no orders regarding the use, adaptation and change of open educational resources, implementation of open code technologies in computers and mobile equipments, and different operational systems are implemented, although all these activities are planned. Today only verbal agreements among programmers and administrators exist, but the documentation in written form does not exist.

The institutional order is implemented in the business organisation regarding the decentralised provision of services and responsibilities. ICT and TEL decisions are not managed and coordinated by one department with the focus on support and maintenance. Monitoring of costs for learning resources is implemented in the business organisation. The integrated qualification improvement and education are not implemented in the distance teaching and learning environment. This activity is planned, but not implemented. The access to library resources, data bases and journals is provided for all learners and employees in distance teaching and learning environment.

Criterion D: Continuing professional staff development

CEO is responsible for constant improvement of the qualification of employees and increase in their knowledge about the quality system. Also they are responsible for the management of internal and external trainings to relate them to technological partnership.

The Department of Quality Assurance and Education is responsible for human resource management, implementation of trainings and monitoring of its quality. In regard to provision of educational products, the educational plans, assessments/evaluation questionnaires, competence evaluation of the

personnel journals are designed. The company established the description regarding the educational level and professional competencies of teachers who provide trainings. Every teacher is required to have a pedagogical qualification. This description has not been revised till now for the last two years. ICT competencies of all employees are constantly assessed, and this activity is performed by the company auditor. The company has no professional teachers; therefore, all the teachers are hired. In such case the business organisation has no need to spend the budget on teacher training and their qualification improvement.

The trainings are often organised by the specialists from the Department of Quality Assurance and Education. These specialists have a possibility to improve their qualification and develop competencies. Also these specialists, as all other employees in the organisation, participate in the conversation with the CEO, who evaluates the specialists' compliance to the requirements. During the conversations, the weaknesses and needs for the qualification improvement of the specialists can be revealed.

Criterion E: Support systems

The company uses the distance teaching and learning environment, thus the learners have possibilities to decide regarding their pace and time for learning.

The procedures for admission of learners are posted on the internet, but they are not applied practically. Several years ago the learners had a possibility to register in trainings on the internet system by themselves, but it is impossible now. Every learner has to come to the company to make an agreement and only having received the data login to the system.

The workload of employees is not regulated by the resource system limitations. Also the company does not provide services to assure that learners who do not have the necessary skills for TEL integration have a possibility to acquire them in the business organisation. The courses are complicated and the learner who has no necessary skills will be uncapable to participate in training.

All the learners have access to a variety of communication resources and tools. Every learner who has questions or difficulties may ask the course tutor

for support. But the tools and services for support of the disabled people are not implemented.

The strategic decisions of e-learning are related to the improvement of employees' ICT skills. The case company is the IT business organisation, and the technologies change constantly; therefore, the strategy of the institution includes the requirement that the company is responsible for continuous qualification improvement of the personnel. Employees participate in trainings free of charge, and all these costs are covered by the company. Also individual learning and consultations maybe provided for employees. Such a strategy is applied usually for new employees.

The development of ICT is planned for a long-term period in order for employees to have enough time to adapt to new practices. The plan of activities in the business organisation is revised and designed every year. Mostly, long-term projects are planned for several years ahead.

The strategic TEL integration into the organisation is related to the improvement of employees' qualification. Every year the company organises the technological days for employees and here the heads of projects present their projects, and employees also present their new decisions. This is the way to interchange the novelties and information.

Criterion F: Quality assurance proceedures

The policy for quality in the business organisation is focused on the assurance of quality, environment and system safety, and the client satisfaction through matching the intellectual, process and relationship, and their direction for continuous improvement of products, services and their provision methods, which assure the satisfaction of the client.

The management system in the business organisation provides the requirements that are compulsory for all employees who participate in company's activities which are related to the quality of services, information safety, activity processes, and etc. The representative of CEO is responsible for the quality in the business organisation.

The description of the training product includes all the information and procedures regarding the designing, development, use, assessment

and evaluation, improvement and implementation. Training courses are permanently evaluated by the independent experts with the focus on their content and didactics. Every new training course, the requirements for its content and teaching methodology are matched with the customer, and the experts also evaluate the prepared course before the start of the training practically and providing the materials on the internet. The course evaluation is important because it creates assumptions whether to plan the next training or to stop it. Every learner evaluates the training course at the end of it.

Quality assurance is the horizontal priority of the business organisation. The expert group is formed in the company for ICT and TEL assessment and evaluation that are internal and external. The business organisation uses the questionnaire surveys, discussions for self-analysis and internal quality assurance. The company also has Internal and external procedures for management of non-compliance design; the tools are used to make decisions regarding the complaints of employees. A representative of CEO makes decisions regarding small complaints right away and accepts the recommendations for improvements. If the complaint is massive, then every half a year the CEO organises a meeting in order to make correct decisions.

Criterion G: Marketing and business

The business plan and the strategy for marketing are developed every year in the organisation. This is the requirement of the Quality management system in the company. Also the policy for company's publicity regarding the activities is realised continuously and here the TEL services are mentioned. This activity is the responsibility of the specialists from the Department of commerce marketing. The specialists develop a strategy and tools for assurance of accessibility for potential consumers.

The procedure for marketing and agreement analysis is applied in the company in order to generate the resources of marketing. The separate budget for TEL integration into the business organisation is not established. Every four months the monitoring of marketing effectiveness is implemented.

Research participants mentioned that the general strategies for TEL services are flexibility and inexpensiveness. In regard to the changes in the

market and its needs, all the training materials and courses are constantly updated. The market prognoses are discussed at the beggining and at the end of every year in order to develop plans for activities and marketing for one year.

The ICT specialist takes care and monitors the distance teaching and learning environment. Then the company does not need to have the financial and administrational agreements for maintaining the TEL programmes, providing support for employees and learners by assuring the effective learning environment.

ICT consultations are the main services for other institutions and the main income of the business organisation. TEL services are not considered to be an important resource of company's income.

Summary. Although the results of the case study are presented in the descriptive way, but a quantitative survey was implemented with the small sample. It is evident from the findings that the most effective implementation in the TEL integration process is of *Criterion A: Strategy and management*. Very limited implementation is related to *Criterion G: Marketing and business*. Also Criteria D and F are very successfully implemented while integrating TEL into the business organisation.

Table 59. Criteria groups.

Criteria groups	Collected total %
A. Strategy and management	Collected: 94.42%
B. TEL curriculum	Collected: 56.26%
C. ICT Infrastructure	Collected: 60.69%
D. Continuing professional staff development	Collected: 79.63%
E. Support systems	Collected: 59.71%
F. Quality assurance procedures	Collected: 68.24%
G. Marketing and business	Collected: 17.73%

The business organisation does not have a separate teaching and learning strategy for integrating TEL into the organisation. All these processes are

embraced in the common strategy of the company. TEL is important in the organisation and TEL integration is assured by the CEO's support, but also by the TEL's characteristic that it is a less expensive, comfortable, accessible learning format for employees than the formal training. The employees are positive regarding the use of TEL services. The CEO supports the participation of employees in professional networks and their qualification improvement in distance learning format.

The implemented system of Quality management and Certificates for safety assures that innovations are the horizontal priority of the business organisation, and the innovations are continuously developed and used. All the company's resources, such as physical and human, are managed by the special computerised equipment (software).

Several limitations were found in the process of TEL integration into the business organisation. The training provision is not the main activity of the company; therefore, the recognition of e-learning courses is regulated only for external trainings that are provided for clients. Moreover, the internal trainings of employees are monitored only in the internal system, and no recognition documentation is provided there. Also it is impossible to transform all the training services into the e-learning. The requirements for quality of some courses necessitate for the traditional teaching and learning, and examination.

Collaboration with higher educational schools is useful for business organisation regarding the development of training courses. Thus the specialists who are responsible for designing of such courses are quite competent from the methodological point of view.

The employees use open educational resources, but they do not know their theoretical basics and requirements for licencing.

The company fully implements the technical requirements for IT systems, safety, synchronic and asynchronic communication, and etc. Also the costs for research on effectiveness and expansion of TEL systems are not planned. Business organisation lacks the manuals for distance teaching and learning environment, and the use of other technologies. Qualification improvement of employees is implemented constantly not only according to the set plan, but also according to the increased needs.

The support system in the business organisation is developed and functions quite effectively. Every year the company prepares a strategy for marketing, but the TEL is not a priority here.

Recommendations manifest the aspects that should be ensured while implementing the TEL into the organisation. Specific recommendations regarding every criterion are provided below.

For successful implementation of *Criterion A: Strategy and management* the business organisation should strengthen the following activities:

• The administrational staff should also participate in the internal training, because they need to know all the novelties regarding the activities of the company, and their knowledge limitations limit the quality of the training course content and organisation.

• The business organisation should develop a specific order which regulates the recognition of all e-learning courses.

• The internal training for employees of the business organisation should be included into the Quality management procedures.

• The information sharing should not be dependent mostly on employees' friendliness and kindness.

• The questioning surveys regarding the quality of the training should be formalised and provided in a formal way by using innovative ICT tools.

• The company should involve employees into the improvement processes not only according to their responsibilities at the specific department. Such a point of view limits the possibilities of innovative and effective improvement.

The effective implementation of *Criterion B: TEL curriculum* in the business organisation is related to these characteristics:

• Implementation of tools for assessment/evaluation and feedback.

• Use of the standardised function of virtual learning environment for feedback.

• Relating the vocabulary of the learning system with the terminology which is used in the training courses.

• Motivate teachers and learners to present themselves by using different IT tools.

The meaningful implementation of *Criterion C: ICT infrastructure* is dependent on these aspects:

• Development of a particular order on the technological standard regarding the use of ICT.

• Planning of costs for effectiveness and development of TEL systems.

• Researching the learning needs, quality and effectiveness of the ICT and TEL integration into the organisation.

• Preparing manuals for distance learning environments and other technologies that are accessible to consumers and planning the costs for such manual designing.

• Implementing the initiatives regarding open learning curriculum or content and the common creative licences.

• Planning the orders regarding the use, adaptation and change of open educational resources, implementation of open code technologies in computers and mobile equipment, and different operational systems.

• Management and coordination of ICT and TEL decisions by one department.

• Integration of qualification improvement and education in the distance teaching and learning environment.

The execution of *Criterion E: Support systems* is dependent on these activity components:

• The procedures for admission of learners on the internet must be applied practically.

• Development of a flexible system on the internet for learner registration into the training courses.

• Regulating the employees' workload by the resource system limitations.

• Providing services to assure that learners who do not have the necessary skills for TEL integration would have a possibility to acquire it in the business organisation.

• Implementing the tools and services for support of the disabled people.

The realisation of *Criterion G: Marketing and business* is related to these characteristics:

• Establishment of the separate budget for TEL integration into the business organisation.

• Discussing the market prognoses at least four times per year because of rapid change in the market.

Case study 3: Community organisation

Choice of setting for case study. The Community Centre is a community organisation which has been active in the community since 2005. The Community Centre (hereinafter CC) was established in the premises of depot for Youth and adult education, when the need for learning, self-education and change increased. The general aim of the CC is to activate the local community and to create possibilities for every community member to improve skills and competencies irrespective of the age, and to improve the quality of community living.

The Community Centre has no formal personnel and all the people work here as volunteers. The active community members successfully solve problems and make decisions on the part of the community, help the community to find its competitive strengths; therefore, the economic and social condition are favourable. The settlement is well integrated into the common economy of the region, and is characterised by growth of economy and the number of inhabitants.

Context of case study setting. The settlement in which the local community lives and the community centre acts is compact but in the periphery, near the second largest town of Lithuania. The settlement is impassable and closed. Approximately 35% of the inhabitants have university level education, and a lot of young people live there. In this settlement, there is a school, a primary health care centre, a church, a post-office, a community home, a centre of culture, a library, a nursing home, a pharmacy, and eight shops. The inhabitants are happy that their settlement has the status of a town. There is no farming and the homestead of rural tourism, but there are a lot of tenement houses in this settlement and the biggest number of inhabitants live in their own private houses. There are approximately 200–250 work places, but most of the inhabitants work in the nearby city. The Community Centre consists of 5 structural subdivisions (clubs), and unites 49 members who pay a membership fee.

Research strategy. The research includes only a qualitative design. The focus group interview was performed with nine research participants. The interview tool was used the same as in the case study with educational and business organisations. Research participants shared their experiences toward

every criterion and its indicators as well as characteristics by providing examples. Also the documentation of the Community Centre was analysed and some important information is also provided in the findings. The findings are presented in a description format and in some parts of the text the excerpts from the transcribed focus group texts are provided.

Sample. The sample consisted of nine Community Centre volunteers.

Tool. The basis for assessment was the authorship and standardised methodology   http://www.reviveproject.eu/vet/quality-criteria/revive-vet-curriculum-design-quality-criteria/. The specific description is presented in the case with the educational organisation.

Findings. In the community organisation, the criteria of quality assurance, resources and continuing professional staff development are implemented effectively.

Criterion A: Strategy and management

Every Community Centre organises, manages and administrates its activity in a local community independently according to its strategic aims and priorities, needs and possibilities, according to its statute and legislative acts of the Republic of Lithuania. The centre which was chosen for the case study formulated its vision, mission and aims clearly. The Community Centre sees the local settlement as safe, economically strong and comfortable for living, where conscious, healthy and educated community cares about the environment of the town and the mode of life. The main purpose of the Community Centre is to rally the local community, to create conditions for every community member for self-improvement at any age, and to increase the quality of life in the community. The mission of the Community Centre is to promote active involvement of the community members into the public life, stimulate good neighbourhood and partnership between all community organisations, strengthen the traditions of volunteerism, and represent the interests of the community in local authorities. The vision and aims of the Community Centre promote the innovations and new decisions through development of ICT.

The basis for the activities of the community organisation in the local community is its collaboration with community members, community organisations, interest groups, representatives of business and local authorities in various phases when organising activities, such as planning and development activity, and evaluating the activity outcomes.

The strategy of the Community Centre is oriented to collaboration with a variety of life-long-learning groups. The Centre actively cooperates with the local business, social partners and other rural communities. The business companies provide continuous support to the traditional events of the town. Members of the community invite representatives from the surrounding communities to various events, organise common educational events or workshops. General partners of the Community Centre are the parish, the centre of culture, the library, and the police.

The chairperson leads the Community Centre. The CC does not hire any personnel and all 49 members work as volunteers.

... all the members are united. They all are organisers, active, responsible ... they are ready to participate in any activities ... it is the basic ... these people are the basic ... first of all they give ... they do not think about receiving ... (Research participant 1)

The strategy does not incorporate a clear proposition regarding the tools of ICT integration and implementation into the activities of community organisation, and there is no regulated order regarding the integration of TEL into everyday activities. But the members of the community centre are active participants in various projects that are related to ICT. The strategy supports the application of innovative teaching and learning methods including the e-learning and learning via internet. In the community organisation, the roles of employees and learners are clear, but transformation of all educational forms into e-learning is not the priority of the community centre.

Community members live in a compact territory, where neighbours see each other every day and traditional teaching and learning methods (classroom meetings, work in interest groups, communication and collaboration face-to-face) for them are most acceptable.

We like to communicate live. We do not have time to be in Facebook and write messages ... we try to meet once per week. We see each other every day, we have to say 'hello' to each

other every day. Really, we do not have the need for very active TEL integration... (Research participant 3)

The resources for information dissemination such as ads on the board (posters, informational reports), flyers, and etc. are widely applied. The chairman of the Community Centre supports and initiates activities that are related to the development of innovations (including ICT). Separate financing for these activities is not planned, but the Community Centre has a possibility to update the ICT through project activities.

Criterion B: TEL curriculum

The Community Centre constantly organises lectures, workshops, TEL related courses, and is also the every year participant of the week for Adult education. Educational events are organised not only for community members, but also for the inhabitants of the town and the rural residents from the surrounding localities. The community members improve their competence with every new activity, new task and project.

We are open every day from morning till ten p. m. For people this time is very comfortable. We organised courses regarding internet-based banking. We also organised sessions regarding the use of Skype. Community members attended the centre to use Skype for communication with their relatives and friends who live in foreign countries. (Research participant 2)

We learn all the year permanently. We have projects, events, sessions, workshops (Research participant 1)

We learn not because we lack competence, but the novelties come and change so rapid. It is useful to know the novelties. (Research participant 4)

The Community Centre also gives possibilities for community members to participate in workshops regarding TEL in other cities. In most cases the representatives go to these workshops or courses and afterwards they disseminate information and share the acquired knowledge with other community members. If educational events are organised in the community organisation locally, then these courses are provided by highly qualified specialists.

We are not only ones who provide educational activities. The library also performs such activities ... there are at least four computers in the library. The librarian provides ongoing

trainings. Training for ICT literacy. This activity is related to the project. Community members know that in the library they will receive the information and will get the help regarding ICT. (Research participant 2)

The Community Centre identifies the needs of the community, areas of issues and threats, and foresees the important activities that should be implemented in order to improve the situation. The Community Centre plans activities and these are described in the Strategic plan of the community organisation. But the analysis of needs for new courses, workshops are realised only within the framework of particular projects. When the projects are not implemented, then the needs are anticipated intuitively and discussed in meetings of the community members.

Recently we have not performed questioning surveys regarding educational and or training activities in the community centre. But we feel this local background and discuss the needs when we meet face-to-face. (Research participant 7)

Trainings are provided not only regarding ICT literacy. Training and qualification improvement courses are realised within the areas of health care, education of children and their parents. Moreover, the courses are provided by medical specialists (physicians, nurses), teachers and psychologists. Also trainings on career planning, self-cognition and self-assessment are implemented in the community centre. Other topics of trainings are such as the first aid, fire protection, occupational safety, the promotion of entrepreneurship, and the family business.

Criterion C: ICT infratructure

The Community Centre has the necessary structural, financial, technical and ICT resources for its activities and the competent personnel which is ready to organise and perform activities in the local community. The personnel have possibilities, but rarely to improve their competencies. The centre has its premises where the administration of the community centre is settled, together with the gym hall. In the Centre's cultural premises, the youth and rock clubs are located as well as an amateur theatre. Facilities are repaired, and the community members like to come here, to have a

cup of coffee or tea, to communicate with each other. Various workshops, discussions, meetings with prominent speakers, and etc. are also organised there. Amateurs can have their rehearsals. In the community, there are a lot of art groups, such as ensembles of men and women, women group of national dances, theatre of amateurs, theatre groups of children and youth, and children's rock group.

There is an arbour and a playfield near the Community Centre, where a lot of community events, meetings and feasts take place. The community may also use computers with open access. However, this service was very popular several years ago, as today community members mostly use computers at home. One community member is responsible for the computer property and regarding the needs this person repairs and monitors the ICT of the community members.

... we had computers with open access, for several years it was very popular ... community members liked to read newspapers on the computer. But it was in 2004. Today it is not a topical issue. Every community member read newspapers at home and uses their own computers. (Research participant 2)

In general, 95% of community members have computers at home. At the centre we have 15 computers since 2003. Today it would be important to change them. We need a new project. (Research participant 1)

The Community Centre has an order on computer use and it is public. Community members who want to use computers have to sign in the formal computer use list. Elements of distance learning are implemented through projects in which the members of community centre participate. The community organisation has no individual/autonomous distance learning environment, but may use free of charge services that are provided by social partners. If community members need, they may use the tools for synchronic and asynchronic communication, but the Community Centre members prefer live communication with each other and with the teacher/lecturer. The Community Centre is a small organisation, its property – computers – are not updated (because there is no need for this).

Criterion D: Continuing professional staff development

In order to improve their competencies, the Community Centre members need external experts that are focused on specific areas. The centre is strong and unites all community residents. Every year, the Community Centre organises a variety of events, in which the most active community members, who mainly contribute to the wellness of the community, are awarded for their innovativeness, implementation of initiatives and dissemination of information. In such events, members from the surrounding communities also participate, and people have a great possibility to share their information and knowledge as well as learn from each other.

We have a lot of experience and we are happy to share our experience and knowledge with other communities, and to learn from other communities too. (Research participant 3)

These events are very useful, because people have a possibility to generate new ideas, to share good practices, and etc.

Criterion E: Support system

The support system for learners has been implemented in the community organisation since the first projects were launched and implemented in the organisation. The settlement is local, people know each other, therefore, it is convenient for them to learn about novelties first when they meet each other face-to-face.

... Our small town is rather closed. We learn the news, novelties, and information from each other. We write advertisements on the notice-board. We have many notice-boards. Today we do not have problems. We have a website of the community centre. We publish information, news on this website. Also through parish. A lot of people come to the parish. You know, it is not difficult to create lists if there are people who want to learn ... (Research participant 7)

In most cases the learners decide by themselves regarding the pace of their learning, and the schedules of courses are developed flexibly. When the trainings are organised, people have a possibility to choose day or evening groups for adult training. Mostly, the community members who do not work come to day groups, and the members who work choose evening groups.

The learners work at the community organisation as volunteers, and they have the access to a variety of tools and other resources, which they can use at work or at home. The community centre is not oriented to individual strategic decision making which is related to e-learning. Community members and all the community may participate in any training courses free of charge. The personal consultations for community members are provided on the basis of volunteering.

Criterion F: Quality assurance proceedures

The quality of the Community Centre is directly related to its and other participants' (community members, community organisations, interest groups, representatives of business and local authorities) collaboration in all the phases of the organised activities. Competent personnel work in the Community Centre, they organise activities in the community and have possibilities to improve their competencies.

> *Every person comes with his/her experience. We have people who are professionals in various areas. We have physicians, lawyers, engineers, and they add their value into the community activities by volunteering. They are real professionals. (Research participant 6)*

The community organisation is responsible for administering the questionnaire surveys if trainings are provided by using the finances from the EU projects. These surveys are related to the quality of trainings and are realised electronically. The Community Centre has no experience in gathering feedback, because no distance teaching and learning environment is created there.

The Community Centre autonomously chooses the tools, ways and procedures for assuring the quality of organised activities, also anticipates the ways of acting and resources regarding the quality. There is no expert group established for TEL assessment, because the community has no needs for this. The quality assurance of trainings, courses, workshops is the horizontal priority of the community organisation. The events are evaluated indirectly by social partners and business representatives by providing financing for one or another event. The most important evaluator of the quality is the community member who is the participant of educational events, courses, and workshops.

Criterion G: Marketing and business

The activities of the Community Centre are organised in three phases such as assessment of the needs and planning the activity, implementation of activity in local community and evaluation of the results. The community organisation applies the strategy for financing in regard to the statute of the Community Centre with the focus on financing needs and possibilities. The finances of the CC consist of the funds obtained from the economic activities, membership, and the support of local community, the EU and national funds, municipality and local business representatives.

The Community Centre participates in a variety of projects, in which they realise various trainings, but the Centre does not receive income from learners. The Centre does not provide ICT services and consultations regarding TEL. Lecturers are hired according to community needs by using the project finances.

Summary. The findings showed that learning is the general value of the local community and the Community Centre (organisation):

• The community organisation is characterised by the following strengths: active and initiative volunteers who work at the centre and coordinate its activities; high quality trainings provided for more than ten last years in the community organisation, for example, courses, workshops, lectures; high level community members' skills in project designing and management; active collaboration of the community organisation with other organisations, social partners, business companies, and other communities; original festivals organised every year, which have become a tradition and directly influences the motivation for changes among inhabitants; active art groups and clubs; volunteering, learning and sharing, dissemination of permanent activities and processes.

• The community organisation provides a lot of training activities, but only a small part of them are related to TEL. The Community Centre is generally oriented to cultural and art education, organisation of community feasts, events and meetings. The vision and aims of the community organisation motivate its members to implement innovations, strive to improve the organisational management and service provision. The organisational strategy

of the Community Centre is mainly oriented to provision of life-long-learning services. The community organisation is active in networking, but inhabitants are more oriented to direct communication and face-to-face relationships.

• TEL integration for the community organisation is not topical, because the community members value traditional training activities in auditorium mostly. The majority of the community members are older adults, and they prefer traditional teaching and learning methods. Other community members, innovative adults and youth use the technologies. It could be concluded that TEL integration into the community organisation is implemented partly, but the community members themselves are not interested to integrate TEL fully.

• The training content is partly oriented to TEL. The community members are satisfied with the current situation and do not see the need for change.

• The community organisation has its order for computer use but does not use it, because community members rarely come to use the computers which are in the Community Centre. The community lives in a compact territory, the computers are old-fashioned and do not correspond to the contemporary requirements for TEL trainings; therefore, computers of community members or rented computers are used for trainings. Earlier most of the computers in the community centre were used for internet access but now this equipment is aged physically and morally. Therefore, the community organisation does not have a reason to improve the existing orders which regulate the use of computers and software, distance teaching and learning environment, and does not plan to prepare manuals regarding the use of the ICT equipment and tools.

• The continuing professional staff development is a relevant activity in the community organisation. The Centre is the initiator of such activities, because then the community members have a possibility to learn and are motivated for improvement and innovations.

• The quality assurance is the effective component in community organisation activities. The support system is partly implemented in the community organisation. The trainings are mostly initiated by international or structural funds, in such cases the support is assured through funds, and the TEL is also applied actively. When trainings are not related to projects, then learners support each other directly and the traditional tolls without TEL are used. The youth or other inhabitants who are skilled ICT users support other

community members through social networks. Community members do not want to change the existing situation.

• The vision, mission and aims of the community organisation are constantly revised; expert groups or even teams of community members are established to implement aims of the Community Centre. If there is a need, then the community organisation applies for external experts. Internal and/or external leaders and experts are asked to provide trainings. The Community Centre is the networking organisation which keeps partnership relationships with other organisations, business institutions, and sponsors. Community members learn continuously and renew their competencies and skills. The microclimate in the community organisation is positive, and the organisational strategy is oriented to various trainings and permanent change.

• The community organisation does not perceive TEL value for learning. The ICT skills of community members are different and need improvement, but the community organisation does not pay attention to TEL strengths. The financial potential of the community organisation is directly related to provision of trainings in the community, but is dependent directly on projects; therefore, trainings cannot be planned beforehand.

Recommendations reflect the aspects that should be ensured while implementing the TEL into the community organisation:

• The community organisation should be activated and focused or concentrated. In addition to that, the community organisation should be focused not only on the cultural and art education of the community, organisation of feasts, events and meetings, but also the TEL strengths should be presented for community members. For this, the experts in TEL integration and curriculum should be invited to provide practical experiences and examples to community members. Volunteers should be invited to participate in the community, for example, youth who has high level ICT skills.

• It is recommended to use the tools of social networking for information dissemination and knowledge sharing. Recently the community organisation has provided information on its website, which is maintained by a single administrator. It is important to duplicate the same information for dissemination and also to provide it in social networks. Teachers, children

and youth should be more actively involved into social networking to ensure its efficient functioning.

• The community organisation website should not be the only tool to maintain the relationships with other organisations. Social networks are of crucial importance here. Therefore, it is recommended to create and support the internet account or group in social network Facebook or Twitter.

• The social networking is recommended for development of public activities by involving the members of youth, rock and other groups and/or clubs that are incorporated into the community organisation as structural parts. It is also important to involve the active representatives of older adults and youth into the decision-making processes. It would stimulate creative decisions through collaboration of Community Centre members and other community members (town residents).

• The system for non-formal adult education should be developed in the community. It is recommended to initiate the events of adult education in which the TEL would be presented for the local community. The partnership and the minimal financing should be stimulated through collaboration between the community organisation and the local business by implementing the TEL infrastructure in a local community, supporting it and updating, and making it accessible to local inhabitants.

• When the EU support is used, the initiation of projects with the focus on Wi-Fi implementation is recommended in the settlements of Community Centre, secondary school and other public objects, environments and spaces of the local community. It is important to initiate the training about the use of mobile technologies and the social networking for dissemination of the information, teaching and learning. The profit from the EU projects is recommended to be invested into the development of TEL infrastructure in the community organisation.

• If the Community Centre strives to be competitive, then it is important to involve the active community members, students, youth into integration and implementation of TEL. It is also important to stimulate the collaboration and cooperation between the local community members and a variety of social partners.

DISCUSSION
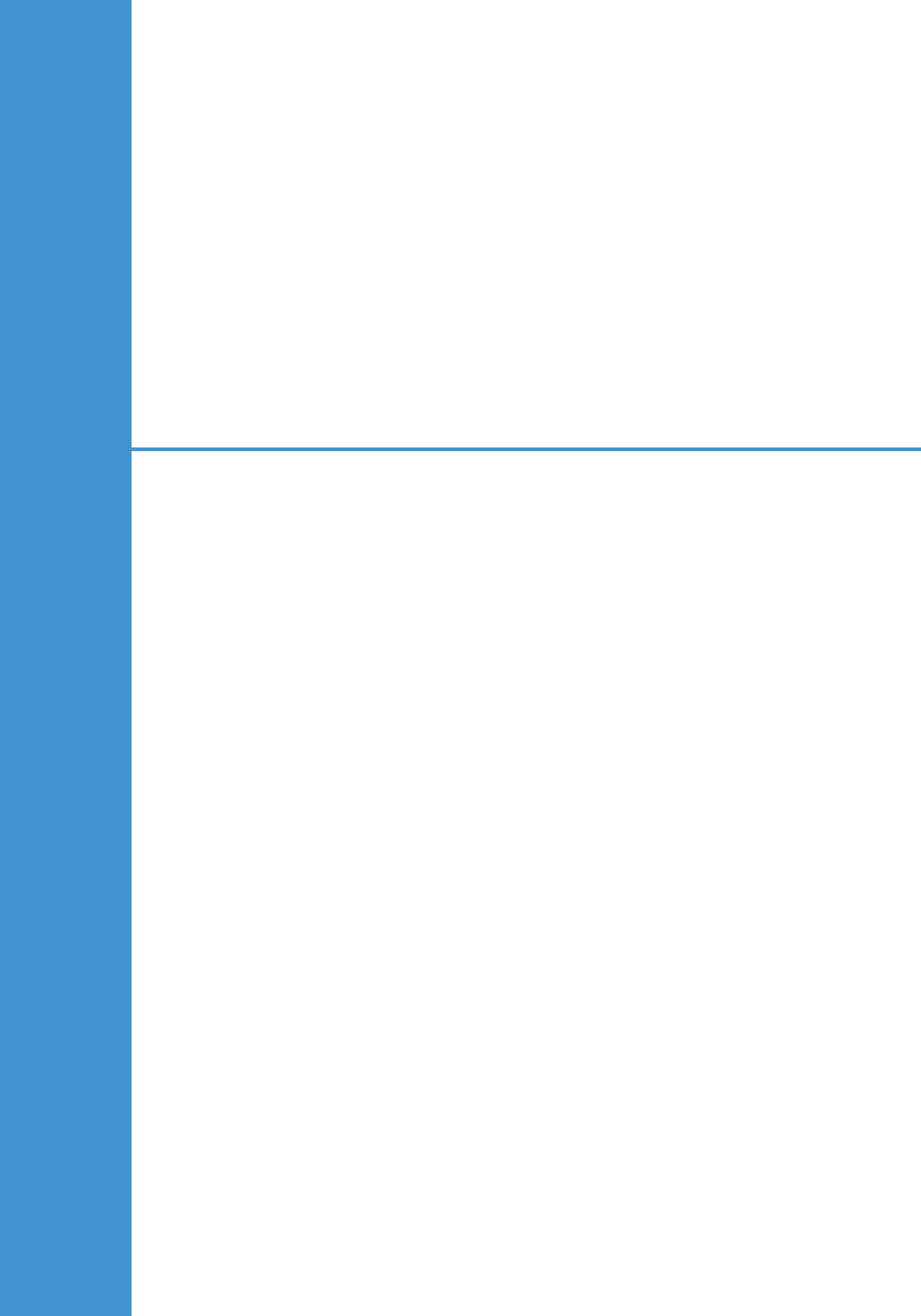
This research addressed the problem of TEL integration into education institutions aiming at developing a theoretical framework of quality assurance parameters. Inductive and deductive research data analyses were used by the authors who, using qualitative analysis of content research method, collected the research data during meetings with international and national expert groups. Theoretical scientific research literature analysis was implemented, the existing frameworks, benchmarking methodologies, quality assurance models were collected and analysed. Institutional practices and documents were analysed during the meetings with the experts, during international (European Distance and eLearning network (EDEN), International Council for Distance Education (ICDE)) conferences, workshops and seminars. Moreover, TEL was discussed and analysed on the basis of the theories of integration of innovations.

As a result of the qualitative and theoretical research, the model of TEL integration in an organisation was developed by the authors of this paper, describing the process of TEL integration in five main phases: a) identifying preconditions for TEL integration, b) developing the case of the institution on the basis of seven TEL quality assurance criteria groups, c) reviewing the case and characterising responsive and responsible TEL integration into the organisation based on the preconditions and case review results, d) taking actions to integrate TEL into the organisation, and e) measuring TEL impact upon the quality of organisation services.

Innovations in education are changing the landscape of education service provision. The development of new forms of services (e.g., virtual mobility, open learning, massive open online courses (MOOCs) and others)

has become a vital phenomenon in education institutions, but it also directly affects learning organisations. The new forms of learning have finally drawn the attention of institutional leadership, policy and other stakeholders, and provision of learning facilitated by technologies has become the mainstream. Many highly ranked education institutions started to produce and deliver open online courses. Professional organisations and networks dealing with the provision of technology enhanced learning forms (such as European Distance and eLearning Network (EDEN), European Association of Distance Teaching Universities (EADTU), International Council of Distance Education (ICDE), and others) implement global surveys on learning services, which show that online learning forms and technology enhanced learning have become valid forms of quality learning. Moreover, the institutions approve that new forms are especially relevant in times of globalisation of education market.

These phenomena coincided with the **consolidation of a network society,** which is becoming ever more digital, global and mobile. In this new societal paradigm, open forms of education, in a close relation to open access to knowledge sources, open software and licensing, are changing our perception and also expectation of what education should be all about: an ever more personalised and flexible learning process. Massive open formal and informal learning emerged and resulted in disruption and transformation of education. Education meets not only the challenges of industrialisation, demography and globalisation, but also the direct impact of lifelong learning service provision needs. Diversification of target groups in higher education makes considerable impact upon institution sustainability models.

Resulting from this **increased personalisation and flexibility, education provision is also becoming more differentiated**. However, **in order for this to be sustainable, the providing institutions have to make sure it will be scalable**. It is this scalability element that assures the lowering down of costs and even more disseminated and wider access to high quality higher education provision. However, this is the biggest challenge and most important factor for successful integration of innovations and sustainability.

In its long experience of supporting the open and digital learning community of researchers and practitioners, EDEN has followed how

critical this development was for the consolidation of quality online learning practices in the past decade. The dissemination of open educational practices (OEP) in education implies the adjustment or change of their organisational cultures towards an open framework. Education institutions need to open up their organisation, methods and services in order to be able to cope with the challenges of an open educational culture.

However, it must be recognised that the establishment of innovative OEP (including MOOCs) in education is often ***introduced episodically***. Moreover, having analysed the horizon of different OEP in Europe, one can notice that great ***confusion exists in terms of concepts*** (MOOCs, OER, Open Access, Open Science, Open Society, Open Education) and phenomena. ***Sudden and disruptive development, as well as segmented integration of innovation into an organisation often lose the desired effect and anticipated impac***t. Such instances could demonstrate irresponsible decisions, bring negative effect to strategic planning and may generate wrong feedback to European discussions on best practices.

Research provides considerable guidelines how management and administration within an organisation should implement their decision to integrate TEL services within an organisation. The summary of research findings proves that organisations should start with the vision of TEL services, measuring internal and external factors, developing strategic tools and measures for TEL integration including funding and support. The research shows that resistance from the responsible bodies exists in supporting and funding the institutional change. Even though administration supports bottom–up initiatives adequately, and even though institutional vision stimulates and encourages implementation of TEL to improve organisation's activities, the least represented research results are in TEL integration support with resources and monitoring TEL integration processes.

A further discussion and evidence are needed to reveal the reasons for lack of support and funding. The scientific literature results show a strong focus existing on information technology infrastructure development in institutions and even countries. State programmes for funding infrastructure development are available, and institutions tend to invest more into infrastructure development rather than professional skill development of their staff. There

is the need to implement the research on the impact of integration of TEL to compare success factors, and the impact of such investments upon TEL integration into organisations.

On the other hand, institutions might have narrow understanding of TEL integration scope and its impact upon their activities. As the concept suggests, technologies play a big role here, and therefore, the understanding might suggest priority investments and focus on technology use and development. If such hypotheses were proved, a statement could be made that institution administration needs raising awareness on TEL integration areas and their impact measurement.

It can be true that awareness raising and better introduction of TEL integration areas to strategy developers within an organisation might affect negative research results showing that it is a rare case when strategies of organisations are supported with specific measures to integrate TEL into organisation activities. These results explain the situation that strategies are written down defining the vision, but not planning specific measures needed to achieve the results.

An interesting observation can be followed comparing the research findings analysing strategy and management prepared for TEL integration and information technology infrastructure development in organisations. Even though the research shows that organisations tend to invest most in infrastructure development, the needs for information technology infrastructure update seem to be not satisfied on the regular basis. It would be interesting to have an overview on planning the investments. Technology development is difficult to grasp. Organisations are definitely dependent upon technological solutions and technology provider decisions. A huge challenge remains for an organisation to be competent and able to invest into the best solution available at a given moment of decision making, minimising the risk of any negative impact of this decision in the future.

Many examples exist regarding the use of virtual learning environments and learning management systems in organisations. Developing curriculum in such virtual learning environments requires high skilled staff, support units (which are still missing in the majority of organisations, as empirical research results show), and constant update and maintenance of the environment itself,

as well as curriculum content. These require high costs. A change in virtual learning environment provider affects the overall organisation which would need to move curriculum from one environment to another. Such movement would bring enormous costs. Therefore, it is very difficult and expensive for an organisation to stay up-to-date with the design and solutions of virtual learning environments used.

New initiatives of quality education services reaching out society members are being established very fast. Open educational resources, open education ideas and practices are among them. TEL services are being updated in organisations, addressing these initiatives with the aim to become gradually open. New challenges to create open learning environments are already at hand in the majority of organisations, following the models of open universities, MOOC (Massive online open courses) providers and companies. Estimating the experience and research findings already described, all types of organisations will have new dilemmas and new difficulties to create adequate technological infrastructures. Research based recommendations are needed to facilitate organisations and to allow better possibilities for their sustainability. Open professional collaboration would be extremely valuable practice for both, technology developers and organisations providing TEL services.

Technology integrates into every single area of human personal and professional life. There is the way to access learning services globally. Therefore, curriculum is the key object for research. It is already common truth that knowledge and information do not exist if not enhanced by technology. Thus TEL curriculum is the curriculum of today's life.

TEL curriculum designing seems to be a very well covered topic in research and practice; however, enhancement of curriculum with technologies highlights and emphasises "old" problem areas that have been long time discussed among academics: does curriculum suggest measurable learning outcomes? Are learners encouraged for active learning and interaction? Do we offer flexible learning services? Do we follow a clear distribution of communication models and contact hours in curriculum? What are they based upon? Learners needs? Administrative regulations? Are assessment methods consistent with the learning objectives/outcomes and activities that

are suggested for learners? Curriculum enhanced with technologies becomes transparent as a litmus paper in the quality check procedure. TEL authors targeting at quality and peer review could appreciate this opportunity for quality improvement. In order to build the bridge between education services and lifelong learning or in-service training, the needs should be identified and links should be established. TEL curriculum should be opened for reviewing and for learning purposes.

Openness of TEL curriculum would solve a lot of issues for all stakeholders involved. Teachers would benefit from the existing resources and would apply them in teaching and learning. Learners would access diverse information and could focus on creative tasks or comparative analysis of solutions to be applied to problems in their everyday life. Companies and education institutions would establish partnerships for staff development, and would benefit from developing OER for public and external communication.

However, one of the biggest problems existing in education and business organisations is lack of openness of learning content and curriculum. The majority of organisations do not have the vision with necessary tools and measures to implement the policy of open education in their strategies. They do not have the aim of openness, as they do not see it as a benefit for their organisation, nor they are aware or can predict the positive impact that openness can bring to them. Research and recommendations are implemented by international organisations, but individual TEL providers need support and funding in order to create and implement this vision.

Another research area which lacks attention is differentiation between TEL curriculum designing and TEL organisation. The researchers themselves do not perceive the necessity to differentiate and describe these two processes. There is a possibility that the uptake of development and use of OER is very limited in the majority of organisations due to the fact that organisations do not differentiate the two processes. For example, education institutions consider designing TEL curriculum and OER purely as a task of their teachers. However, there is process in TEL organisation where TEL curriculum is used in order to work with the learners and interact with them on different topics and activities. There is the need to investigate these differences and the potentials that are opened for TEL providers.

Having taken the research findings into consideration, as well as new phenomena in the landscape of education already discussed multiple times in this research, there are still questions pending that should be further discussed: how can TEL curriculum designing implement the society needs to enrich learning situations with new critical citizenship skills? To create common wealth and comprehension? To validate and get recognition of open and informal learning? To enlarge learning perspectives and results with active social peer learning and common added value in the society? These answers need further research and recommendations for immediate next steps in the creation of quality TEL services.

Having researched TEL integration framework, there is evidence that all integration criteria groups are highly interrelated. Continuing professional staff development for TEL integration is closely related with TEL curriculum designing, but also with the strategy and management criteria groups and information technology infrastructure.

A hypothesis can be raised that with the strategy and management items being well in place and defined, continuing professional staff development would be implemented on the basis of proper ICT competence framework, on a regular basis with fairly available resources. Consequently, staff would be up-to-date to provide quality TEL services, with quality TEL curriculum, and information technology infrastructure would not raise considerable issues for staff performances. Of course, this hypothesis should be further researched.

Furthermore, other questions for scientific discussions remain to be open and should be further elaborated. Even though professional networks already do provide possibilities for teachers and other academic staff to collaborate and to open their practices for peers, how much are these possibilities explored and used, and what are the incentives and barriers for participation in these networks? What does open professional collaboration actually mean nowadays and how is it implemented? To what level professional collaboration can be open in the context of tight competition of different types of organisations and unemployment in the labour market? The answers to these questions might facilitate continuing professional staff development and could provide important answers for organisations creating these possibilities for their teachers and trainers.

The need to establish support systems for teachers and learners for TEL service provision does not raise any doubts and is substantially illustrated with research results. However, new forms of support appear as useful, which do not have illustration of direct impact and, therefore, call for further research.

Good practice sharing is one of the best known methods, which is usually mentioned by teachers when they are asked about their needs. However, this process might be left alone or on the need level only. Empirical research results show that little practice exists on how to collaborate and share different TEL artefacts in order to support each other's work. This is an interesting research area, closely related with the online community practices which have emerged quite recently in comparison with long lasting traditional teacher communities. It would be interesting to follow the dynamics of teachers participating in international communities, contributing with their examples and cases, and analysing their origin and needs.

Mobile learning and TEL curriculum accessibility through mobile devices are not so new in organisations, even though it is developing very rapidly. However, teachers expressed the need to receive more considerable support for using different mobile devices and operating systems available on different hardware devices. How much this issue is still the issue of an organisation and which scope of support might be available for individuals on this issue – should be addressed within an organisation and decisions should be accepted.

There is no doubt that TEL services should be assessed in terms of quality assurance and might be the object for benchmarking policy. However, there is a dilemma existing how TEL institutional quality assurance can be embedded in the European quality assurance requirements for study programmes. Current procedures do not meet the actual needs of TEL services. Learners express their needs for flexible, open and international collaborative experience, with flexible contact hours and forms of participation, focusing on learning outcomes and all stakeholders' needs. International curriculum peer reviewing quality criteria are targeted to a more traditional study process, involving face to face placements, face to face participation and formal frequent feedback from the learners.

TEL is a new form of learning service which has definite learning outcomes, but which is open to labour market needs more than to administrative institutional procedures focusing on face to face participation. Learning happens in a variety of places (physical and virtual), and the assignments and activities are being "reported" as evidence in virtual learning environment. This is a new approach to the learning process and learning participation, which needs a shift in organisation of education services and their quality assurance procedures. New sets of criteria and, most importantly, new quality assurance procedures should be investigated and established.

Among many roles that management, administration and staff have to implement to integrate TEL into an organisation, development of marketing strategy and business plan is one of them. Even if there is a separate unit within an organisation to establish regulations, image and branding of an organisation, as well as internal and external communication procedures, all stakeholders will still be involved and trained on marketing and business monitoring. This is an inevitable process.

However, there has to be an optimal model researched and established. First, marketing and business should be among the competencies that staff should be trained for. Second, they should be participants of the process, but maybe not responsible staff. Open communication might also bring risks to the image of the organisation, but also to the extent TEL service is open for the public. These limits of openness, participation and visibility should be further researched, and best practice case studies would be most interesting readings for all types of organisations integrating TEL and openness.

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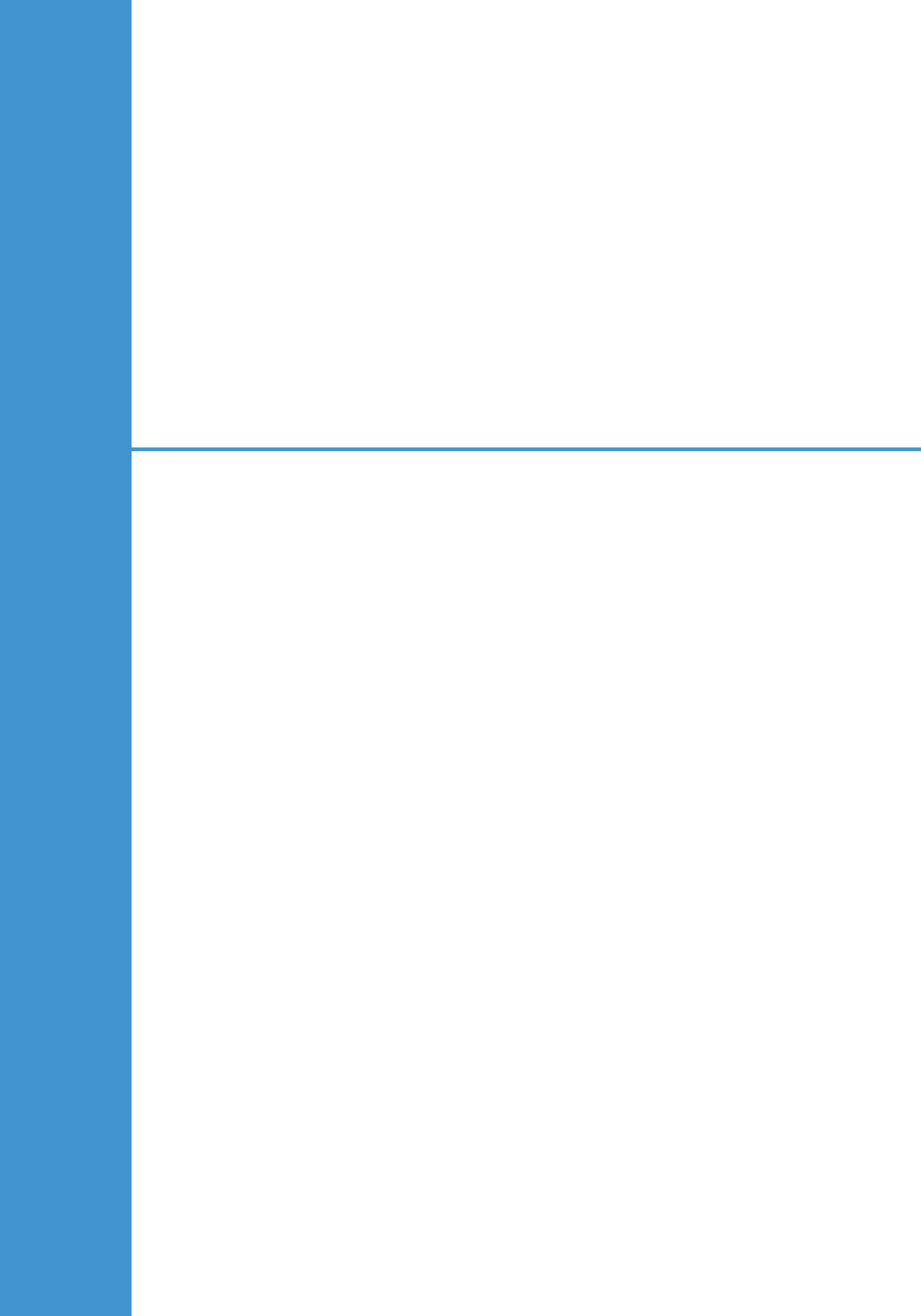
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ANNEXES
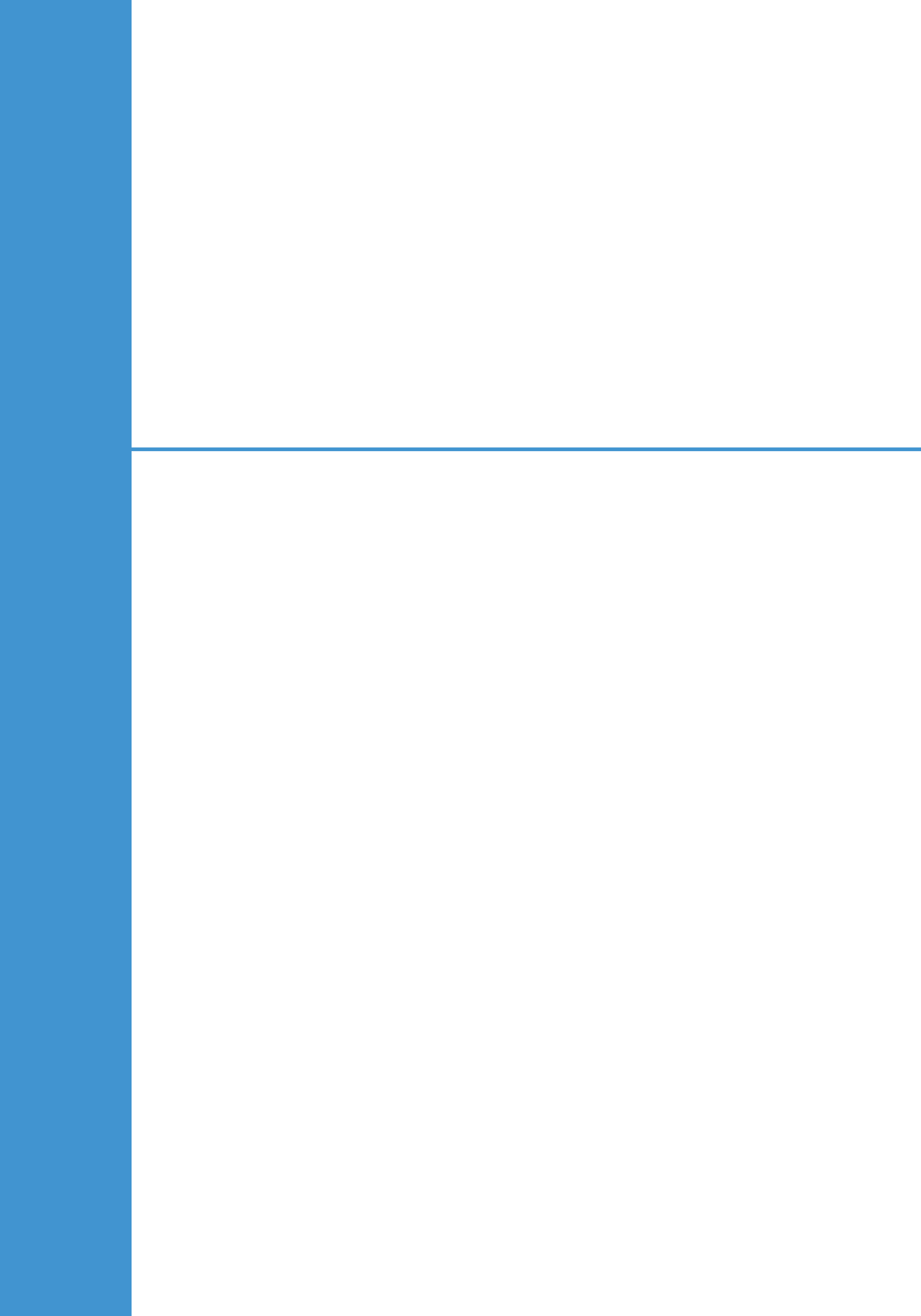
Annex 1

Survey questionnaire (used as an online version)

	Strategy and management	Very poor	Poor	Average	Good	Excellent
1	Institutional vision stimulates /encourages implementing TEL to improve organisation's development					
2	The strategy of organisation is oriented towards TEL of different target groups and stakeholders					
3	The strategy of organisation is supported with action plans of integrating TEL into institutional activities					
4	The strategy of organisation is supported with specific measures of integrating TEL into institutional activities					
5	The strategy of organisation is supported with resources of integrating TEL into institutional activities					
6	There are existing monitoring processes of TEL integration					
7	Management decissions are made to assure TEL integration (technical staff support, processeses, funding, etc.)					
8	Development of TEL policy is learner centered and personalized in terms of existing knowledge, skills and competencies					
9	All staff members are well aware of TEL curriculum integration strategic guidelines					
10	Top management is responsive to bottom-up initiatives					

	ICT Infrastructure	Very poor	Poor	Average	Good	Excellent
1	Requirements for ICT infrastructure are described					
2	Requirements for ICT infrastructure are fulfilled					
3	Virtual learning environment is used					
4	Synchronous and asynchronous communication tools are used for TEL					
5	Technological solutions implemented in the organisation support open education ideas					
6	There is a dedicated unit for IT maintainance and user support					
7	There is a unified user access to all TEL services provided in the organisation					
8	There is a direct access to databases (library resources, journals).					
9	Budget is planned on a regular basis for update and development of IT infrastructure					
10	Infrastructure ensures accessibility through different devices, online/offline					

	TEL curriculum	Very poor	Poor	Average	Good	Excellent
1	Learning outcomes are measurable					
2	A variety of learning methods is used to enhance active learning online					
3	Assessment and self-assessment tools are technology enhanced					
4	Planned TEL results are applicable to professional practice.					
5	Open educational resources (licensed under Creative Commons) are used					
6	TEL includes experiential knowledge and skills					
7	TEL is focused on applicability in practical activities					
8	Clarity of workload and schedule are suitable for learners					
9	Structure of content creates possibilities for flexible learning					
10	TEL encourages learners to use and establish interactivity					

	Continuing professional staff development	Very poor	Poor	Average	Good	Excellent
1	Organisation has clear requirement of ICT pedagogical (didactical) competencies for teachers and trainers					
2	ICT pedagogical (didactical) competencies of teachers and trainers are regularly updated					
3	Organisation has clear requirement of ICT competencies for staff members					
4	ICT competencies of staff members are regularly updated					
5	A budget is planned on a regular basis for staff members for CPD purposes					
6	Organisation provides variety of TEL forms for CPD					
7	Organisation regularly performs evaluation of CPD activities					
8	CPD foreseen for technology competences					
9	Staff members are participating in virtual teaching networks					
10	ICT skills are significant for professional career development in an organisation					

	Support systems	Very poor	Poor	Average	Good	Excellent
1.	Individualzed user support system is designed to assist access to TEL resources					
2.	Free access manuals/tutorials for self-learning of specific ICT skills are available					
3.	Support system is available 24/7					
4.	FAQ are provided					
5.	Most frequently used templates are available					
6.	Feedback tools and procedures are available					
7.	User support for using different mobile devices/operating systems is available					
8.	User support to collaborate and share different TEL artifacts is available					
9.	User support for TEL in multi-device cloud computing environment is available					
10.	Chat/forum channels for user peer support are available					

	Quality assurance procedures	Very poor	Poor	Average	Good	Excellent
1.	Internal procedures for TEL quality assurance are established					
2.	TEL curriculum is regularly revised and assessed					
3.	External quality experts participate in internal quality assurance procedures					
4.	Internal peer reviewing of TEL practices is implemented					
5.	TEL service quality assurance is embedded in institutional quality assurance processes					
6.	Each individual can contribute to quality assurance procedures					
7.	Each user provides feedback to TEL services					
8.	Quality assurance standards are established at the organisation					
9.	User feedback and TEL services evaluation results serve TEL service development					
10.	Quality assurance is oriented towards TEL service improvement					

	Marketing and business	Very poor	Poor	Average	Good	Excellent
1	Social networks are used in organisation for internal communication.					
2	Social networks are used in organisation for external communication.					
3	There are experts responsible for internal communication in organisation.					
4	There are experts responsible for external communication in organisation.					
5	There is regular evaluation of effectiveness of communication in organisation.					
6	Income from TEL makes a significant part of organisation income.					
7	ICT is used to ensure a diversification of organisation activities.					
8	Organisation is using various ICT tools to reach different target groups.					

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9	Organisation explores ICT skill development needs of its staff members					
10	Organisation considers suggestions about the use of ICT from its stakeholders					

The study presents a framework of responsible and responsive technology enhanced learning integration into organizations. Applying the theories of integration of innovation in an organization, technology enhanced learning integration criteria groups have been identified and validated in this study in the following sequence: 1) Strategy and management, 2) Information communication technologies and infrastructure, 3) Continuous professional staff development, 4) Technology enhanced learning curriculum, 5) Support systems, 6) Quality assurance, and 7) Marketing and business development. The implementation of framework of technology enhanced learning integration into three types of organizations – vocational education and training, business and community organizations – have been researched and results presented.

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Technology Enhanced Learning Integration into Organizations

Scientific study