Implementing Blended Learning Technology in Higher Professional Education

Blended Learning: Promising Strategic Alternative in Higher Education

Satisfaction on Blended Learning in a Public Higher Education Institution: What Factors Matter?

Prospects of Blended Learning Implementation at Technical University

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Abstract

The paper dwells on the learning outcomes of experimental implementing of blended learning technology in the English language teaching to engineering students of the Tomsk Polytechnic University. The aim of blended learning application is to enhance efficiency of the learning process by means of up-to-date highly-technological means of instruction. The author identified the level of information competency of engineering students, analyzed psychological readiness of engineering students to handle information and communication technologies, verified the efficiency of information and methodological support of blended learning in teaching foreign language to engineering students and performed the processing and analysis of the experimental data.

Keywords: Computerization of education; motivation; psychological readiness; blended learning; information and linguistic competencies.

1. Introduction

The development of modern society occurs in the information age, characterized by the use of information and communication technologies (ICT) in many areas of human activity, including education. The peculiarity of the present stage of computerizing higher education is great importance of substantial aspects of student training at the university. Quality of higher education will largely depend on successful solution of this problem. University graduates have to live in an information society, and then it is not only necessary to master the methods of obtaining

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and processing information, but, above all, to learn to make rational use of information and information technology to maintain and develop their intellectual and creative potential (Obkov, et al., 2015).

Many researchers (Bersin, 2004; Dudney, 2007; Fomina, 2011, 2014; Kalmykova, 2013; Mijares, 2014; Shitova, 2011; Oxford, 2011; Tomlinson, 2013; Watson, 2008, and others) consider a rational combination of traditional educational technologies with modern information and communication technologies as one of the possible ways to solve the problem of modernizing education on the basis of information.

Currently, one of the promising applications of ICTs in education is blended learning technology. Blended learning is a combination of face-to-face learning with Internet-based training, especially of the second generation, which allows participants to cooperate in the educational process. Blended learning is recognized as training including 30 to 79% on-line training time (Clarc, 2003).

Thus, blended learning can be considered a sort of electronic learning or its extension; its main difference is the necessity of face-to-face communication of students with each other and with the instructor. Bonk (2006) states that blended learning, in a certain proportion, mixes face-to-face and distant learning technology, which allows simultaneously using two modes of training, eliminating almost all their shortcomings. An increasing number of people tend to receive their education with minimal time losses, since the rapid pace of life leaves less time for face-to-face learning. To date, blended learning is a fast and dynamic mode of training. Many large companies have already experienced its positive effect: employees receive high quality education on the job. Thus, it can be assumed that in the future blended learning takes a leading place among the traditional modes of education and becomes one of the main competitive advantages of higher education institutions providing educational services based on the Internet resources and face-to-face communication.

Thus, the paper, contributing to the English language teaching modernization, will identify the level of information competency of engineering students, expose psychological readiness of students for innovative means of teaching foreign languages as well as preferred modes of learning foreign languages, determine the level of linguistic competency of students, estimate the degree of student motivation and the development of professional skills in foreign language communication.

2. Research Methodology

2.1. Theoretical study and hypothesis

For effective delivering the academic courses by means of blended learning it is necessary, first of all, to develop methodological support of the syllabus. Methodological support of the syllabus defined by Jochems (2004) is teaching materials, designed to study a particular academic discipline, which include a set of interrelated by learning goals and objectives various kinds of pedagogically useful, substantive educational information delivered by various media resources. Blended learning consists of the following methodological support:

- teaching materials
- computer support, designed on the basis of modern information and communication technologies (Richards, 2012).

According to Fomina (2011), information support of the educational process of engineering students is considered as two interrelated components. The first component – content of the discipline, goals and objectives of education, aimed at mastering a certain amount of scientific knowledge; developing worldviews, cognitive activity, new economic thinking, creativity, entrepreneurship, needs to constantly replenish the knowledge; attracting interest to the professional activities; acquiring technical, economic and other skills.

The second component – software of the educational process: system and applied software, software systems used in one form or another, including the tools environment for designing training programs and software systems. Software also includes hardware which is meant to be used in the education information environment such as computing, telecommunications, satellite, television, peripheral, copying, office and other equipment, as well as data channels.

Rossett (2003) declares that software information support of educational activities of the universities in the field
of blended learning is largely dependent on the type of the university system, educational process organization, the level of computerization as well as information and communication training technology.

Methodological support is divided into two sections: training and organizational support. Training support is database of teaching materials, control system of the database, teaching methods, and tests, recommendations for blended learning technology in view of didactic and psychological aspects. Organizational support is, relevant to local and federal laws, modes of organizing educational process, as well as recommendations for the use of ICT. Thus, methodological support is a system of methods, tools and techniques to purposefully and consistently achieve high quality results in the education system (Matukhin & Evseeva, 2014).

Based on the foregoing, it is appropriate to present information and methodological support as a system composed of three subsystems: 1) content; 2) software; 3) methodology.

For the successful operation of the training system, the performance of each subsystem of information and methodological support (IMS) separately and its joint performance is required. The technology of designing IMS consists of the following steps:

- design of teaching materials
- development of the software structure
- computer design of the content and layout of the software
- test of the software and its modification
- development of methodological guidelines for students and instructors (Matukhin, et al., 2014).

Based on the results of the conducted theoretical study of didactic opportunities and psycho-pedagogical features of the ICT application in the learning process and the developed information and methodological support have been formulated the problem and the hypothesis of the study.

The hypothesis of the study: application of information and methodological support based on the principles of multi-level, modularity, humanistic and professional orientation of the content optimizes educational and cognitive activity of students, forms linguistic competency, develops academic autonomy and creativity, improves information competence of the future professionals.

2.2. Questionnairing

Questionnaire study started with the multilateral survey of the student population. The volume of knowledge and skills acquired during the foreign language learning at high school was identified; the personality motivation of each student (basic motives of educational activity, interest in receiving future profession, self-esteem, interpersonal communication methods, etc.) and their psychological readiness to use ICT in foreign language learning was studied.

In the process of observation and interviews the motives of students to study foreign language were revealed; their content preferences, as well as their opinion of the necessity of foreign language for an engineer were identified. As a result of observations and interviews it was exposed that the majority of students link the knowledge of a foreign language with the future professional activity (75%) and feel the need for professional foreign language (64%).

Studying the readiness of engineering students to use blended learning means in teaching foreign language was conducted in two ways: the first – the identification of the level of information competence of students; the second – determination of their psychological and motivational readiness for the use of innovative learning tools.

Maturity of information competence of students was tested by the method of questioning. In the survey were questioned 128 engineering students of the first year of education. The experiment proceeded from the fact that 100% of the students have got the opportunity to work on the computer because the university facilities are provided with Wi-Fi connection and several computer labs are equipped with the Internet access for the organization of independent study of the students.

The detailed guidelines for using each type of resources have been compiled in order to avoid undue influence of insufficient development of computer skills of the students in the experimental group on the results of their work.
with ICT tools. In addition, extra time to become familiar with the basic elements of the user interface programs was given to the students. Thus, the actions were taken to minimize the negative emotions and psychological barriers that often occur when working with a computer, which could adversely affect the results of the study.

Level of psychological readiness of the students to work with the innovative means of information technologies was tested by the method of questioning and interviews with students. Moreover, questioning was carried out twice: before and after the experiment. Repeated questioning after the experimental study showed that opinion of respondents changed in favor of the preference to use the Internet resources as the main means of instruction (65% before and 99% after), but audio (25% and 58%, respectively), video (18% and 68%, respectively) and computer programs (30% before and 78% after) as an additional means of training.

The attitude of engineering students to the up-to-date information and communication learning tools changed due to the acquisition of skills to deal with them, since before entering the university most of the respondents had no experience in learning by means of information and communication technologies (27%). Therefore, the means of information and communication technologies are not enough common among former high school students, most of who were engaged in foreign language learning by means of traditional means of instruction. Internet resources are used mainly for writing papers, preparing essay and reports, translating texts by electronic translators. The findings also indicate a low level of motivation among the respondents, since with all the diversity and accessibility of teaching means, only 18% were engaged in further foreign language learning.

The next question that the students were asked was about the preferred modes of learning a foreign language. In the given options deliberately laid gradually increasing degree of independence and taking into account individual and personal characteristics of the student. The findings suggest that preference is given to the training organization which, in one form or another, takes into consideration the level of language proficiency and individual features of a particular student. Herewith, 94.5% of the students can get along without instructor’s supervision, but in most cases the instructor is expected to show individual approach and to create comfortable emotional learning environment.

Thus, in the end of the questionnaire study the following tasks have been completed:

- level of information competence of engineering students has been identified
- psychological readiness of students for innovative means of teaching foreign languages has been exposed
- level of linguistic competence of students has been determined
- preferred modes of learning foreign languages have been identified
- level of student motivation has been estimated

2.3. Experimental study

Observation of the educational activity of engineering students in the process of working with the software, conducted interviews, and quantitative data of the experimental results indicate that interactive mode “human – machine” encourages creating conditions that eliminate psychological discomfort that will eventually reveal the potential of the trainees. Students acquire self-confidence which significantly rejuvenates training activities; there occurs an incentive for further work. The mode of active interaction with the program encourages developing their intelligence: mobilizing attention, improving the perception and memory (Thorne, 2004). Students become active initiators and supervisors of their independent learning activities, thereby increasing their self-awareness and self-esteem. Herewith, the instructor acts as a facilitator and consultant. Educator gains access to the test procedures and the ability to monitor the process of teaching material retention. Such training contributes to the development of need for the professional improvement of foreign language knowledge, learning motivation, emotional and creative spheres of the student’s personality.

In addition, the educational information provided in these computer programs can be replaced by the instructor (without programmer) that ensures the implementation of the author’s approach to presenting educational material and adapting it to the specific population of students.

Survey, conducted in order to identify the readiness of students to use ICT tools, showed relatively low levels of interest and utility evaluation of applying new technologies in the educational process: about 75% of respondents considered them as quite important and only 25% as very important. However, after the experiment the respondents showed high levels of interest and utility evaluation of applying new technologies in the educational process: about
20% as quite important and 80% as very important. Thus, students understand the significance and importance of ICT application in teaching the English language and show a high enough interest (average assessment of importance and interest).

To trace the change in the development of professional skills of foreign language communication during the experimental work (see Fig. 1), the absolute growth rate (AGR) was used, which shows the difference between the initial and final level of the given indices: \( AGR = I_{\text{fin}} - I_{\text{in}} \).

![Fig. 1. The AGR change of the development level of professional foreign language communication skills.](image)

The content of the developed academic discipline has been designed based on the following principles: integration, personality-oriented input information, content openness, contextual learning and modularity; on the basis of qualification characteristics and job descriptions of the respective specialties, as well as the State educational standard of higher education in the specialty and the syllabi of specific disciplines.

Herewith, in the course of experimental study was theoretically justified and empirically confirmed the effectiveness of information and methodological support of blended learning of engineering students. The students increased the level of training motivation, degree of academic autonomy, developed information readiness to use new learning tools. Consequently, integrating the information and methodological support with the blended learning technologies is pedagogically appropriate and encourages optimizing the learning process and its computerization.

Organization of the educational process in a blended learning system contributes to creating favorable conditions for the holistic development of the individuals, their abilities and qualities, including professionally significant, due to:

- specific interaction of subjects of training
- ability of a student to work with the information independently
- creation and maintenance of the positive emotional environment during training activities
- organization of the guided, corrected and assessed independent work of the student (Matukhin & Gorkaltseva, 2015)

Herewith, the quality of education can be improved if the following conditions are met:

- organize the effective interaction of an instructor and a student at all stages of the learning process, as planning, creation of conditions, training, assessment and correction require the collaboration of the instructor and the student
- pay special attention to the development and maintenance of students’ sustainable motivation and mastering reflection skills, as reflexive activity allows the student to analyze the course of academic activity and its results, and the presence of an incentive is a prerequisite for effective education
provide independent educational and cognitive activity of students, since in the frame of the modern educational technology self-study plays a large part in the learning process (Valiathan, 2002).

3. Conclusion

As a result of theoretical and practical study it has been found that the use of means of new information technologies contributes to the humanization of the educational process, allows implementing in practice the idea of student-centered learning. One of the promising applications of the information technology is blended learning. Blended learning technology integrates the traditional learning tools with the means of new information technologies (Desmet, 2011). The use of new information technology tools is a necessity, conditioned, on the one hand, by scientific and technological progress, on the other hand – the society needs. Application of blended learning provides individualization and differentiation of the learning process, implementing the principles of clarity, adaptability and usability, ensures the objectivity of knowledge evaluation. The choice of teaching aids should be educationally and economically feasible, as well as methodologically provided; in addition, for the implementation of high educational potential of electronic resources they need to be systematically applied. Taken as a whole these conditions can help achieve the academic goals set for the educators of the higher education institutions.

References

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Blended Learning: Promising Strategic Alternative in Higher Education
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Abstract

Problem Statement:
Contemporary higher education faces numerous improvements worthwhile challenges, such as unfavorable demography, problematic quality management, lack of skilled resources, aging population or unconsolidated delivery of related study programs.

Purpose of the Study:
System of higher education is under permanent development. Although it has succeeded in implementations of local or partial changes, perspective global solutions are still missing. To improve this situation, we want to propose a viable strategy for educational managers and decision makers, capable to motivate people, minimize internal tensions and stabilize this sector.

Research Methods:
Initially we summarized the most evident bottlenecks of contemporary higher education and formulated the desired target arrangements. Findings from literature review were categorized, summarized and represented with mind map. Knowledge and data from previous experiments was used for design of system diagram, characterizing external and internal factors of proposed model, as well as single subsystems and their relations.

Findings:
We believe that innovative educational platform, based on practices of blended learning, can shift the traditionally rigid educational system towards more flexible networking structures. According to our experience, properly trained and institutionally supported teachers, equipped with heterogeneous teaching artefacts can address more students with lower expenses and higher quality. Moreover, such courses can be easily sheared, combined or reused.

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Conclusions:
Systematic, domain wide introduction of semi virtually delivered blended courses to higher education can solve many problems, existing in this sector. This approach is based on mobility and extensive exchange of teachers, their specialization and individual work with group of students. Due to structural flexibility, blended courses can be tailored for any audience. Explicitly existing educational processes can be straightforwardly quantified, managed and improved.

Keywords: Blended learning, distant education

1. Introduction

Higher education, as well as other areas of life, nowadays, is influenced by four complex and interrelated processes: globalization, internationalization, virtualization and industrialization. Consequently, universities are faced with an increasing need for sharing resources, using virtual networks, cooperating on educational programmes design and striving to suit the needs of various industrial sectors. Coping with such challenging conditions requires a fundamental shift from the traditional concept of self-contained universities to a new updated system where universities could cooperate in a flexible mode to promote faster exchange and implementation of innovative ideas, serve a broader spectrum of students from different cultural backgrounds, wider age groups and with varying educational needs. Last but not least, such cooperation would reduce expenses and bring substantial savings to the participating universities.

In our article we first review the present problems and issues that higher education is forced to tackle and reflect on the possible solutions with help of available sources. Based on our previous experience and research we propose creation of a cross-university model of mutual cooperation based on educational infrastructure bringing about changes in organizational and managerial arrangements, institutional structures and services provided while improving the quality. The core concept of our model is semi-virtual education using professionally prepared blended learning courses designed in cooperation among universities. The flexibility of the courses would allow their application across more universities while saving both material and human resources.

2. Problem Statement

Contemporary higher education is faced with a number of challenges requesting attention, such as unfavourable demography, aging population, problematic quality management, lack of skilled resources, or unconsolidated delivery of related study programs.

2.1. Demographic Development

As an example of adverse demographic development we can check out the situation in the Czech Republic where the statistical figures indicate a starting decline in the higher education age group. The demographic trends reflecting quantitative development of universities have gone through significant changes and turnovers in the last few decades. In the period of 2002 – 2005, the size of the age group remained almost unchanged and stabilized at about 135 thousand people. The demographic turning point at Czech universities characterised by a sharp decline of the relevant age group has already started in 2013. The course of this demographic decline is characterized by its steepness, which in a few years will decrease the size of university age group to only a little over 90 thousand people. Compared to the years of 2002 – 2005, the university age group size will have dropped by one-third. It is believed that this low level of the relevant age group will continue for approximately ten years followed by a short-term population increase. However, the assumption is that the numbers will fail to reach the original level, although the traditional university age group will be complemented by students of distant form of studies from
higher age groups. Students of combined and distant forms of studies in particular could benefit from blended learning courses (CSU, 2014).

2.2. Quality Management

Another issue in the sphere of higher education, which is related not only to the Czech Republic, is quality management. Since the nineties of the last century quality management systems in higher education sector have been gradually introduced as described by Srikanthan & Dalrymple (2003), Haug (2003), Materu (2007), Brookes & Becket (2007). The implementation of quality management systems in higher education sector has taken place mainly in the USA and Europe. It is true that other countries and parts of the globe, such as the Middle and Near East, Africa, China, Australia and New Zealand, have endeavoured not to be left behind. The implementation of quality management systems has led to debates within organizations and among academics about the importance of higher education. One part of the debating was concerned about the restrictions of academic freedom and the proliferation of administrative controls. The other side points to the effectiveness of change management, higher academic standards, increased number of staff and student satisfaction. Discussion concerning the issue can be found in works by the following authors: Harvey & Green (1993), Lomas (2001), Srikanthan & Dalrymple (2002), Vidovich (2002), Hodson & Thomas (2003), Cruikshank (2003), Chua (2004), Vidovich, (2004), Hoecht (2006), Mizikaci (2009), Williams (2009).

Gregory (1996) proposes four dimensions of leadership in his model of distributed leadership for managing changes in higher education organizations: symbolic, political, managerial and academic dimensions. On the symbolic level the role of the leader is to represent the whole institution, to persuade others to fulfill the organizational goals and to demonstrate the corporate image to the world. The political role includes gaining support and resolving conflicts for the benefit of the institution. The role of the leader as a good manager consists in dealing with costs, budgets, information flow, employee relations but also in setting goals, structuring, staffing and communicating. The academic role lies in the skills of a leading professional who supports and develops quality and promotes change.

Michael et al. (1997) recommends that the key to Total Quality Management (TQM) is top leadership as the driving force behind success and failure. Effective and meaningful communication, good training, benchmarking and research in the field of TQM can increase the success rate.

Owlia & Aspinwall (1996) explained the quality in higher education using dimension identification frameworks defining mainly the quality of the product features (Garvin, 1987) and service features (Parasuraman, Zeithaml & Berry, 1985; 1988). Chua (2004) classifies the quality attributes of education more comprehensively in the Input–Process–Output (IPO) framework in which ‘Input’ refers to the entry requirements, ‘Process’ refers to the teaching and learning process, and ‘Output’ refers to the employability and academic standings (as shown in Figure 1 below). This classification of quality attributes reflects the operation system of converting the inputs into outputs via the process in any organizations including educational ones.

![Figure 1 - The Input-Process-Output framework of quality classification](source: Chua, 2004)

The issue of quality management has also been discussed and handled in the Czech Republic within the Bologna Process. The Bologna Declaration deals with the issue of quality in higher education as this area has been of priority...
since the beginnings of the Bologna Process. In 2000 the European Network for Quality Assurance in Higher Education was established to promote European cooperation in the field of quality assurance. In 2004 the Network was transformed into the European Association for Quality Assurance in Higher Education (ENQA). EQUA joins together 40 quality assurance organisations as members from 23 countries within the European Higher Education Area (EHEA) (including the Accreditation Commission of the Czech Republic) and 49 quality assurance organisations as affiliates from 28 countries worldwide. (NTBE Czech Republic, 2013)

In 2013, the National Team of Bologna Experts of the Czech Republic issued a statement on quality management regarding the establishment of standards for systematic external evaluation of educational and research activities of universities. The accreditation commission warned that clearly formalized standards cannot be created and quality assessment of higher education cannot consist in mechanical comparisons, whether the university meets the formally defined standard or not. (NTBE Czech Republic, 2013)

In 2008 the European Parliament and Council adopted the Recommendation on the establishment of the European Qualifications Framework for lifelong learning (EQF). The EQF aims to establish a common reference framework as a translation device between different qualification systems and their levels. The EQF applies to all types of education and training from general to vocational and higher. Unlike the traditional approaches which emphasize learning inputs (e.g. the length of study), EQF is based on the outputs of the learning process characterized via knowledge, skills and competence descriptors. Implementation of EQF should improve transparency, comparability and portability of students’ and workers’ qualifications (EQAVET, 2008). The quality of higher education is defined in levels 6 to 8 of EQF.

The Czech Republic, as a member of the European Union, fulfills its obligations by adopting the national qualifications framework. The creation and implementation of the EQF is to ensure greater transparency, excellence and quality of education at Czech universities and colleges (Q-RAM, 2012).

2.3. Aging Population

Other issues pertaining to higher education in the Czech Republic include a shortage of skilled human resources and aging population. With the increasing average age of the adult population and also the retirement age, the numbers of people in their fifties or sixties who need to proceed with their education are growing as well. These people seek educational opportunities, which leads to the advancement of institutions providing courses and training to older people, e.g. University of the Third Age. Blended learning courses could be a suitable and beneficial solution for these people. Nevertheless many opponents of the method argue that the aging population does not have the appropriate technical training to be able to effectively use educational methods based on ICT. However, the opposite appears to be true. Even people from higher age groups strive to adapt to the contemporary social environment requiring from everybody who wants to be successful to use ICT in everyday life and at work. A questionnaire survey carried out in 2010 and 2011 examined the willingness to learn and computer literacy of adults in the Czech Republic. Results of the survey clearly show that older people want to be educated in technical fields and in modern technologies to keep pace with younger generations (Vojackova, 2011, 2012).

2.4. Unconsolidated Provision of Similar Programs

The last problem to be mentioned here is the unconsolidated provision of similar programs of study. Various universities offer programs that often differ in only a few subjects, yet every university prepares its own courses. Such a waste of resources could be eliminated by a more economical and efficient system where interdisciplinary teams of experts would create blended learning courses applicable at more universities. The quality of the courses would be guaranteed by experts in the field, professional course designers and teachers.

3. Purpose of the Study

As we have indicated above the system of higher education is under permanent development while being confronted with a range of issues which need to be addressed. Although implementations of some local or partial
changes have been successful, perspective global solutions are still missing. To improve this situation, we want to propose a viable strategy for educational managers and decision makers, capable to motivate people, minimize internal tensions and stabilize this sector.

Students at colleges and universities, who are familiar with all kinds of technologies, which they use in everyday life for communication, searching and sharing information, naturally expect the use of such technologies also in educational process. This expectation is fulfilled by the offer of e-learning courses.

In its beginnings e-learning was considered as technologically based approach allowing elimination of the teacher from the educational process (Mason & Rennie, 2006). This conception of e-learning emphasizing implementation of technologies into the processes of teaching and learning, while at the same time neglecting the fundamental role of communication and cooperation among people via computer networks, has been gradually abandoned (Andrews & Haythornthwaite, 2007). With respect to our own experience and knowledge we believe that e-learning cannot be limited only to sole application of technologies, which corresponds well with the following definition by Zounek (2009, pp. 37-38) “e-learning covers both theory and research as well as any real educational process (with variable degree of intentionality) which, in accordance with ethical principles, includes the use of ICT working with electronic data. The method of ICT application and availability of materials depend primarily on educational aims and content, educational environment character, needs and capabilities of all participants in the educational process.”

The broad-spectrum potential of e-learning predetermines its use in a wide range of courses in different branches in distance learning where all the instruction, materials, tasks, experiments, exercises or tutorials take place via technologies without any face-to-face contact with the teacher or other students. Modern ICT however are also effectively used in traditional full-time or part-time courses. This combination of traditional instruction with e-learning is commonly called blended learning. Together with Smith et al. (2001), Koen (2002) and Dexter & Gurwitz (2002), we consider the active involvement of the teacher in blended learning courses to be a significant advantage over the “traditional” e-learning.

Blended learning can promote effective learning by meeting the needs of the digital generation, as contemporary young people are often designated. These needs are different from those fifty or more years ago because the knowledge and skills required from people to succeed in modern world have changed. The “21st century skills” is a term used to determine the skills to be developed in people of the 21st century related to the areas of communication, creativity, cooperation, critical thinking and technological literacy. All these areas can be supported by properly designed and applied blended courses.

Taking into account the fact that digital technologies are widely used in higher education at present, academic staff are acquainted with their use (although to a very different extent) and that the application of ICT has a beneficial potential for students in higher education, we propose blended learning as the basic concept for the creation of a new educational framework.

4. Research Question

The challenging issues discussed in the preceding paragraphs put forward a crucial question: is it possible to establish a common platform, simultaneously overcoming the existing limitations of higher education? We believe that it is possible although the steps necessary for implementation of new approaches will also require from academics, managers and responsible decision makers to be open to new ideas and points of view.

It is true, that in the last few decades the academic world has witnessed enormous changes in teaching practices and techniques applied in higher education resulting from the introduction of ICT, e-learning and blended learning into the educational process. In our opinion the potential of e-learning, or more specifically blended learning, is much broader than the implementation of single ICT-based courses prepared and applied by individual universities. In this article we would like to present our ideas on how blended learning could become a central part of an innovative educational framework with efficient internal structure contributing to the increase in quality and simultaneously to the reduction of expenses.
5. Research Method

We suggest, update and generalize data and findings from previously conducted experiments which will finally allow us to articulate and summarize conclusions and to propose searched model of feasible semi-virtual cross-university education.

In our search for relevant resources allowing us to support our proposal we decided to focus on papers (Voracek, J. & Kontro-Vesivalo N., 2002; Voracek, J., Kontro-Vesivalo, N. & Luukko, A., 2002; Alaoutinen, S., Kontro-Vesivalo, N., Uteshev, A. & Voracek, J., 2003; Alaoutinen, S. & Voracek, J., 2003a ; Alaoutinen, S. & Voracek, J., 2003b; Alaoutinen, S. & Voracek, J., 2004) dedicated to projects of cross-border university using semi-virtual courses. The authors of the papers present their experience with the International Masters’ Programme in Information Technology (IMPIT) and the foundation of Cross Border University (CBU) in Finland.

IMPIT project is based on active cooperation among three Finnish and seven Russian and two Czech universities forming the international IMPIT collaboration network. The program consists of courses in computer science and telecommunications and the studies are two years long. The first year consists in intensive studies of the relevant field while in the second year student works on an individual project and master’s thesis while working in a Finnish ICT company if possible. The programme was started in 1999 and the first students graduated in 2000. IMPIT programme is still successfully running at the University of Eastern Finland.

Conclusions drawn by the authors of the IMPIT project can be summarized in the following points:

- Appearance of courses depends on individual teachers.
- Editing of packages can be a sensitive issue from a legal point of view.
- Active participation and proper motivation of teachers is an essential precondition for the ultimate success.
- The teacher should be completely isolated from the technical aspects which should be administered by experts.
- All educational data must be archived in an appropriate format.
- Courses globally enhance the learning process at universities.
- Positive discussions, close cooperation and sharing of experience help to develop a generally appropriate infrastructure for virtual learning.
- Collaborative learning is an efficient technique for virtual education.
- After thorough experimenting with different delivery techniques, the final model of a semi-virtual course includes audiovisual lectures and exercises, quizzes, homework, classes given by teacher, project and its presentation and exam.
- Virtual learning improves the quality of teaching and minimizes the workload of teachers.
- Replacement of students’ mobility by traveling teachers, which is cheaper and overcomes a number of legal and administrative constraints.
- In case of cooperation between universities from more than one country it is necessary to take into account also cultural specificities and differences.
- The system of shorter but more intense events is motivating, emphasizes quality over quantity and minimizes cultural shocks or brain drain.
- An important role in virtual education is played by academic honesty. Academic dishonesty may negatively affect the creation of long-term educational partnerships and student exchanges at the international level.

The authors of IMPIT project succeeded to move from conventionally taught courses to the prototype of a semi-virtual course accepted and positively evaluated by hundreds of students and recognized by academic authorities in two participating countries.

The CBU was established with view to the developments, experience and achievements of IMPIT to enhance the model and limit possible problems. The CBU is an educational institution with good basis for common research and industrial projects consequently supporting regional development. As well as in the case of IMPIT, CBU’s operation is still continuing.

Administrative and institutional arrangements need to be properly designed to facilitate smooth running of any project conducted in cooperation among more institutions. The administrative structure of CBU could serve as
a feasible example for our purposes. The structure is composed of three levels with clearly defined responsibilities (see Table 1):

Table 1. Administrative levels of the CBU.

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<tr>
<th>Level</th>
<th>Structure and Tasks</th>
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<tbody>
<tr>
<td>Institutional (network)</td>
<td>Decision-making board established from representatives of the partner institutions:</td>
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<td></td>
<td>- Global planning and strategic decision making;</td>
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<td></td>
<td>- Distribution of finances.</td>
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<tr>
<td>Executive unit:</td>
<td>- Internal development and quality control;</td>
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<tr>
<td></td>
<td>- Contacts with industry;</td>
</tr>
<tr>
<td></td>
<td>- Extension of the network;</td>
</tr>
<tr>
<td></td>
<td>- Practical coordination of partners;</td>
</tr>
<tr>
<td></td>
<td>- Exchange of information.</td>
</tr>
<tr>
<td>Management of partner</td>
<td>Local coordination unit:</td>
</tr>
<tr>
<td>universities</td>
<td>1. Integration of CBU-level processes into existing local structures. This, for example, requires new services or advanced guidance for foreign staff and students.</td>
</tr>
<tr>
<td></td>
<td>2. Tackles the tasks of bilateral interest, such as the legal aspects of mutual cooperation, the recognition of credits, theses, double master’s and doctoral degrees or the implementation of the Bologna structure.</td>
</tr>
<tr>
<td></td>
<td>The centre for the support of virtual education:</td>
</tr>
<tr>
<td></td>
<td>3. Provides services, standards and technical arrangements related to virtual or semi-virtual education.</td>
</tr>
<tr>
<td>Departments of partner</td>
<td>Teaching and development of single courses. Academic supervision of CBU students. Realisation of CBU research and industrial projects.</td>
</tr>
<tr>
<td>universities</td>
<td></td>
</tr>
</tbody>
</table>


Educational stages such as enrolment or graduation in CBU are too closely related to the particular conditions of concrete study programme to be generalized, but it is obviously necessary to define the content of each stage clearly with all the participating universities.

Like IMPIT, the CBU employs semi-virtual courses in the educational process. The authors of CBU concept (Alaoutinen, S. & Voracek, J., 2003b) specify the following requirements for the applicability of cross-border semi-virtual teaching which is also relevant for cross-university semi-virtual courses:

- A single lecturer must be able to deliver the same course, during the same period, to students in several locations;
- Close personal contacts between students and lecturers are necessary;
- The quality of semi-virtual education must be comparable with that delivered by traditional teaching methods;
- For developing and studying in courses, a standard, standalone personal computer is enough.
- Teachers regularly visit distant students.
- Content production is sub-contracted.
- The quality of course materials and teaching becomes a public issue.

The results achieved in the projects of IMPIT and CBU and conclusions drawn in the reviewed papers served as a platform for the design of our educational prototype.
6. Findings

We believe that innovative educational platform, based on practices of blended learning, can shift the traditionally rigid educational system towards more flexible networking structures. On the basis of the given findings, we designed a prototype of cross-university semi-virtual education. The essential part of the prototype are blended learning courses combining e-learning with the traditional face-to-face contact between teacher and students. The courses are prepared in cooperation between universities participating in the project using the resources and expertise of both affiliated and sub-contracted professionals. Due to structural flexibility, the courses can be tailored for any audience and modified, combined or reused according to instant needs of the educational institutions.

The face-to-face contact is ensured by mobility of the teacher rather than the students, thus reducing expenses and minimizing tensions in students arising from frequent commuting or prolonged stays at partner universities. Using e-learning techniques and mobility of teachers also decrease the numbers of staff demanded. The teacher is properly trained and institutionally supported, equipped with heterogeneous teaching tools to maintain and enhance the quality. At the same time, the teacher is not involved in the technical aspects which are administered by respective experts. The course materials are available to the public to enable feedback and promote relevant expert discussion contributing to the quality level.

The implementation of the courses must be unconditionally supported by all the partner institutions in the form of strategic planning, financing, appropriate legal background, the recognition of credits, technical equipment. Support of the Ministry of Education as the highest authority is necessary. However, realization of the presented concept will require creation of infrastructure enabling the proposed changes to be implemented. Further detailed work on the concept is vital.
The mind map in Figure 2 presents our conception of blended learning as a core of our educational prototype. Blended learning and e-learning have some of the aspects shown in the mind map in common. As in any educational process, the fundamental participants of e-learning/blended learning are naturally students and teachers whose roles are however modified in accordance with the changes implied by the use of ICT in the process. Another inseparable element is the platform representing the technological equipment and background. The content of e-learning/blended learning course should have a clear internal structure in the classes. The organizational structure covers marketing, management and all kinds of necessary support. What distinguishes blended learning in our prototype are the relations with external partners. Ministry of education exercises the roles of a decision maker on accreditation matters, reviewer and quality control guarantor. Collaboration with other universities on the creation, implementation and evaluation of courses as well as the assessment of the results achieved is of utmost importance in the prototype. The success of the whole system depends to a large extent also on continuous cooperation with industrial and regional partners. The contacts and communication with companies and regional institutions will allow the system to react with flexibility to the needs of the labour market and to support regional development. All the relationships presented in the structure should be explicitly defined to minimize disturbances, bureaucracy and teachers’ and students’ workload.

7. Conclusions

The introduction of semi virtually delivered blended courses to higher education within the cross-university system can solve many problems existing in this sector. Despite the necessary initial workload of all the stakeholders involved and investments into the creation of functional infrastructure, the efforts expended will pay in the course of time.

Although we realize that the informative value of our findings based on papers dedicated to cross-border universities is to a certain extent limited by the fact that the projects concentrated on specific conditions, location and problems addressed, we believe that the conclusions derived from the findings are generally applicable and could well serve as the foundations for further research leading to the creation of a feasible cross-university system suitable for higher education.

Acknowledgement

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References


Satisfaction on Blended Learning in a Public Higher Education Institution: What Factors Matter?
Satisfaction on Blended Learning in a Public Higher Education Institution: What Factors Matter?

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Abstract

Blended learning is a popular learning approach among higher education institutions as it integrates face-to-face teaching with web-based learning. As there is an increase usage of blended learning, there is an urge in measuring its quality via students’ satisfaction. The present study aims to: (1) examine the relationship between individual factors and students’ satisfaction on blended learning; (2) determine the relationship between situational factors and students’ satisfaction on blended learning. Data were collected from students of a public higher education institution using questionnaires. The findings and implications of the study are further discussed and elaborated.

Keywords: Blended learning; public higher education institution; perceived value; perceived ease of use; learning climate; student-instructor interaction

1. Introduction

The progression of information technology such as internet surged the growth of online educational programs which change the traditional system of education (Sher, 2009). The emergence of technology has become a competitive advantage for higher education institutions as it can provide an alternative approach in providing better quality of learning. Even though Malaysia is still in the infancy stage in implementing teaching and learning using technology, many public universities in Malaysia are transforming themselves to be a fully electronic university in future (Lim, Fadzil, and Mansor, 2011; Raja Maznah, 2004). This plan includes teaching and learning program which
is conducted via online or web based mode to replace the traditional classroom learning. As a result, public higher education institutions need to be ready for the online delivery learning which supports distance education (Raja Maznah, 2004). The notion of combining face to face and online learning, blended learning, have emerged to be a popular method of delivering knowledge in the knowledge era. Yet, higher learning institutions have only taken on the idea of blended learning as a way to provide learning opportunities for students worldwide in the last decade (Arbaugh, 2014). Blended learning has become a well-known technology-based approach used both in private and public higher education institutions especially in Malaysia. By combining a few delivery modes of teaching, blended learning not only provide variety of options but also claimed to be more useful to students. (Farahiza, 2010). According to Graham (2006), blended learning refers to an arrangement of various instructional methods, online delivery and also include face-to-face instruction between students and instructor. One of the ways to evaluate the effectiveness of blended learning is through the satisfaction of its users (Arbaugh, 2014). Wu and Liu (2013) revealed several studies that consider student satisfaction as a crucial parameter to evaluate and assess the learning effectiveness specifically in academic institution. Past research deemed that satisfaction on learning represents the sum of students’ feeling and attitude that results from aggregating all the benefits that a student hopes to receive from blended learning environment system (Wu, Tennyson, & Hsia, 2010). Hence, it is considered to be relevant when evaluation learning effectiveness in teaching using user’s satisfaction (Wu and Liu, 2013).

Even though many studies have been conducted on online learning, studies specifically on blended learning are still scarce (Arbaugh, 2014). As factors that would influence students’ satisfaction towards blended learning are still explored, thus it would be interesting to identify the issue. Hence, the aims of this study are: (1) to examine the relationships between individual factors (ease of use and perceived value) and students’ satisfaction on blended learning; and (2) to determine the relationships between situational factors (learning climate and student-instructor interaction) and students’ satisfaction on blended learning. Thus, it is expected that the findings of this study will enlighten the ways in achieving students’ satisfaction on blended learning subsequently leading to an effective implementation of the learning approach in higher education institutions.

2. Blended Learning

The literature revealed several definition of blended learning. Within this literature, the general consensus on blended learning definition often used is the one that unites the traditionally separated model for teaching and learning. The combination of instructions consists of: - 1) traditional face-to-face learning system; and 2) the electronic learning (e-learning) system (Graham, 2006). Whether it is formal or informal educational landscape, the learning process should compromise of either 1) a course schedule; or 2) face- to- face interaction outside the physical classroom. In order to consider the learning approach to be defined as blended learning, the combination aspect needs to be fulfilled (Naaj et al, 2012). Singh (2003) reported that in order for a learning approach to occur as blended learning the two characteristic must be combined so that it complements each other, and promotes learning and application-learned behavior.

2.1 Ease of use and student satisfaction

Once increased presence in electronic world is realised to its full potential, the higher education industry has much to gain (Garrison & Kanuka, 2004; Graham, 2006). This is transforming learning to focus on increasing the level of interaction between human and technology-based support through collaboration, virtual communities, instant messaging, and blogging. Learning transformation seeks to lead higher education into use on a daily bases. Blended learning’s main objective is to infuse delivery experience which provide the most efficient and effective instruction, and effective in generating open communication for teaching and learning. Blended learning approach is encouraging the type of communication between instructor and student that balances between stable cohesive influence and limitless access to information on the Internet (Naaj et al, 2012; Garrison & Kanuka, 2004).

As researchers understand the definition of blended learning, the next logical chronology is to determine the effectiveness of blended learning for the recipients. Researchers have identified students’ satisfaction as an important factor in measuring the quality of blended learning (Naaj et al, 2012). Students’ satisfaction can be measured from his level of pleasure as well as the effectiveness of the student’s education experience. Small et al (2012) revealed student
satisfaction is influenced by self-motivation, peer interaction, course structure, instructor feedback and facilitation. However, these factors may not lead to the intended learning outcomes. Researchers continue to argue that satisfaction is dependent on instructors’ understanding and method of delivering the knowledge according to students' preferred styles, which differs according subject matter. Wang (2003) found that in any higher education institution, student’s level of pleasure and effectiveness of student’s education experiences determines student’s satisfaction on blended learning. Hence, Sher (2009) investigated students’ level of satisfaction to reveal that students with higher levels of satisfaction towards various aspects of e-learning courses have considerably higher levels of learning than students with low level of satisfaction.

To better understand the mechanisms of student’s satisfaction of blended learning and its effects, Owston, York and Murtha (2013) analysed the combination of face-to-face and online learning environments used to deliver blended learning. Their review revealed that students benefit from increased time and spatial flexibility during courses; wider and easier access to resources used in the learning process; and a higher level of autonomy to regulate their learning process. In addition, participation in face to-face interactive activities helps students interact with other students in the class and develop close connection with one another (such as friendships) which promotes and develops strong learning interaction outside of the classroom (Callopy & Arnold, 2009). Hence, Wu’s et al (2009) model of student learning satisfaction assumes three main three factors that influence student learning satisfaction which are (1) perceived ease of use; (2) perceived value; and (3) learning climate. They also proposed that blended learning system provide an environment for social interaction and instructor should motivate positive interaction publicity. It is necessary here to clarify exactly what is meant by perceived ease of use. As defined by Wu and Liu (2013), The term perceived ease of use refers to the degree to which students perceived that being involved in blended learning would be free them from effort and easy to operate. Joo, Lim, and Kim (2011) used the term perceived ease of use in the blended learning context refers to the degree to which a person believes that using a particular interface and content delivery will be effortless.

According to Sahin and Shelley (2008), to date, several studies examined perceived usefulness and perceived satisfaction on undergraduate students’ intention to use Internet-based learning resources. It has conclusively been shown that users who consider reusing e-learning tools are the individuals who consider the e-learning tools to be useful and easy to use. These individuals have increased the use of e-learning tool positive attitude toward the intervention. (Joo, Lim, and Kim, 2011). This indicates that distance education instructors need to emphasize on students readiness to use a variety of learning technologies, and develop awareness on online learning benefits. Thus, studies show a need for well-designed and carefully implemented online learning environments that meet the needs and expectations of students (Sahin & Shelley, 2008). Additionally, Wu and Liu (2013) found that perceived ease of use are positively related to students’ satisfaction. Therefore it is hypothesized that:

Hypothesis 1: Ease of use is positively related to students’ satisfaction on blended learning

2.2 Perceived value and student satisfaction

To determine the effects of perceived value on students’ satisfaction, Borstorff and Lowe (2007) reported that e-learning enables students at higher education institution to obtain their education in as they purse their personal goals and maintain their own careers. Students are able to achieve personal and career goals without a need to attend classes and be subjected to a rigid schedule. In a study conducted by Entmer et al. (2008), it was found that when instructors play a vital role in promoting students’ motivation, students’ perceived value of their discussion in online learning increased to actively take part and interact between them. In their interesting analysis of student’s perceived value, Entmer et al. (2008) identifies that online discussions increases when students perceive content as relevant, interesting, and enjoyable. Therefore it is hypothesized that:

Hypothesis 2: Perceived value is positively related students’ satisfaction on blended learning
2.3 Learning climate and student satisfaction

Since international collaboration increased in education, extended education became more prominently present, such as life-long learning and learning-on-demand paradigms. Flexible blended learning environment is becoming more of a necessity for the extended education landscape (Wei & Chen, 2008). Prieto and Revilla (2006) uses the term ‘learning climate ’ to refer to the learning atmosphere in the context of Blended Environment Learning System, while ‘classroom climate’ refers to interaction among class members, physical environment and class materials to form a special emotional perception which refers to class psychological environment (Wei & Chen, 2008).

In recent years, according to Wei and Chen (2008), there has been an increasing amount of literature on factors affecting classroom climate and learning effectiveness such as teacher individualities that focuses on the vital role teachers play in development of classroom climate and learning effectiveness. Beginning and provisionally-registered teachers gets more support from students in open learning spaces. More experienced colleagues can monitor, support and celebrate teachers’ progress and ongoing low-level mentoring can easily put into place because seasoned professionals are to the left and the right of them (Osborned, 2013). Naaj et al (2012) found that learning environment in which social interaction and collaboration are allowed and encouraged lead to positive learning outcomes. Likewise, Sher (2009) holds the view that learning environment encourages shared learning experiences, builds a sense of community among students, and supports teamwork.

This view is supported by Walker and Fraser (2005) who points out that while classroom learning environments can improve student outcomes, education practitioners and researchers must develop a way to measure the learning environment before they can make any changes in that environment that will lead to improvement in education effectiveness. Tennyson (2010) suggested that trust and collaboration between learners encourages and stimulates positive learning climate that facilitate exchange of ideas, opinions, information and knowledge. This study revealed that learning environment characteristics have positive associations with student satisfaction in higher education industry. Moreover, addresses calls for more research into student satisfaction in distance education (Walker & Fraser, 2005). Therefore it is hypothesized that:

Hypothesis 3: Learning climate is positively related to students’ satisfaction on blended learning

2.4 Student-instructor interaction and student satisfaction

For Sher (2009), student-instructor interaction refers to instructor’s delivery of information, encouraging the students, and provides feedback. Picciano (2002) reflects that interaction in an an online course or face to face learning are studied for various purposes including vitality of a discussion, students readiness to share ideas, participation in collaborative activities, and group projects, all of which support productive learning environments. Instructional delivery and instructors and students communication are executed concurrently or intermittently (Her Wu et al, 2008). Instructor who 1) encourage students to actively participate in the course discussion; 2) provide feedback on students’ work and inform them of their progress periodically; and 3) treat them as individuals are more satisfied (Sher, 2009). Small et al (2012) suggest that students feel exchanges with the instructors is essesntial in an educational environment because lecturers are perceived as experts.

In the education literature, researchers’ belief in the important of student-instructor relations is so widespread that it is crucial for learning to occur (Sher, 2009). In addition, Small et al (2012) found that interpersonal communication and responsive and timely communication between student and instructor were the imperative variables for students. Students are still satisfied even with communication via general community spaces such as online notice boards. Picciano (2002) suggested that the interaction is the concept of presence, where they feel that they are part of a group or "present" in a community will, in fact, wish to participate actively in group and community activities. The ability to ask a question, to share an opinion with a fellow student, or to disagree with the point of view in a reading assignment are all key learning activities (Picciano, 2002). Hence, Sher (2009) emphasize that the positive and significant relationship between interaction dynamics and student learning and satisfaction outcome illustrate that learning program provide students with what is valued in education: the interaction with instructor and other students. Therefore it is hypothesized that:
Hypothesis 4: Student – instructor interaction is positively related to students’ satisfaction on blended learning

A research model for student learning satisfaction was proposed based on the relevant review of the literature. This model suggests that there are two main factors that contribute to the satisfaction of a blended learning. Firstly, individual factor which consist of two dimensions, perceived value and perceived ease of use. Secondly, situational factor which also consist of two dimensions that are learning climate and student-instructor interaction.

3. Methodology

A quantitative research design was adopted for this study. This study was conducted in one public university in Malaysia. The respondents in this study were the students from various business degree programs. Data collection was conducted internally within the university using questionnaires. Contacts were made with lecturers to help out in distributing the questionnaires. The respondents were guaranteed on the anonymity and confidentiality of the data provided which will be used for academic purposes only. The instruments were adapted from various sources which have been proven to be reliable and valid. The range developed by Wu et al (2009) was used to measure perceive value, perceive ease of use and learning climate. Measurement items for student-instructor interaction use were adapted from the work of Ali and Ahmad (2011). The survey questionnaire used five point likert scale ranging from (1= Strongly Disagree, 2= Disagree, 3= Neither Agree Nor Disagree, 4 = Agree and 5= Strongly Agree. All data were analyzed using Statistical Package for Social Sciences (SPSS).

4. Results and Discussion

The number of questionnaires distributed to students for this study is 500 ranging from various business degree programs ranging from semester 1 until semester 5 of a public university in Malaysia. Out of 500 questionnaires distributed, only 400 were found to be usable for the study, yielding a response rate of 80 percent. The respondents of this study were consisted of 21 percent male students and 79 percent female students.

4.1 Result Analysis

The study uses cronbach alpha to demonstrate the internal consistency of the results across items within a scale. Overall, the cronbach alphas, means and standard deviations among variables are displayed in Table 1. Cronbach Alphas of variables were ranged from 0.88 to 0.95. Among the independent variables, perceived value shows the highest mean of 3.44. The mean scores for satisfaction on blended learning dimensions ranged from 3.29 (student-instructor interaction) to 3.44 (perceived value). In addition, the standard deviation for independent variables ranges from 0.82 (perceived value) to 0.94 (student-instructor interaction). Descriptive statistics of the study’s variables are shown in Table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronbach Alpha</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction on Blended Learning</td>
<td>0.95</td>
<td>3.51</td>
<td>0.83</td>
</tr>
<tr>
<td>Perceived ease of use</td>
<td>0.88</td>
<td>3.40</td>
<td>0.90</td>
</tr>
<tr>
<td>Perceived value</td>
<td>0.90</td>
<td>3.44</td>
<td>0.82</td>
</tr>
<tr>
<td>Learning climate</td>
<td>0.88</td>
<td>3.39</td>
<td>0.85</td>
</tr>
<tr>
<td>Student- instructor interaction</td>
<td>0.90</td>
<td>3.29</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Pearson Correlation analysis is done to determine the direction, strength and significance of relationships between all the interval or ration variables in the study. It studies the relationship between any two variables among the variables tapped in the research. The (r) between 1.0 will indicate positive relationship while (r) -1 will indicate a negative correlation. In this study, all variables indicate a positive relationship when tested between two variables. The researcher has to conduct bivariate correlation on the data collected in order to identify the correlation between each variable (Singh, Abdul Ghani, and Teoh, 2009). The correlation results are shown in Table 2 below. Based on the
above table, it shows that all dependent variables have positive and large correlation with the independent variable (satisfaction on blended learning). According to Cohen (1988), the correlation value of 0.5 is large, 0.3 is moderate, and 0.1 is small. The table indicated all correlation values are ranging from 0.5 and above, thus all correlations values can be considered as large. The independent variable, perceive value ($r=0.75$, $p<0.01$) has the highest correlation to the dependent variable, of which satisfaction on blended learning. Meanwhile, student-instructor interaction show the lowest correlation ($r=0.65$, $p<0.01$). Other independent variables that significantly correlated with the dependent variables are perceive ease of use ($r=0.71$, $p<0.01$) and learning climate ($r=0.73$, $p<0.01$).

Table 2: Pearson Correlation Analysis.

<table>
<thead>
<tr>
<th></th>
<th>Satisfaction on blended learning</th>
<th>Perceive ease of use</th>
<th>Perceive value</th>
<th>Learning climate</th>
<th>Student-instructor interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction on blended learning</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived ease of use</td>
<td>0.71**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived value</td>
<td>0.75**</td>
<td>0.71**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning climate</td>
<td>0.73**</td>
<td>0.69**</td>
<td>0.76**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Student-instructor interaction</td>
<td>0.65**</td>
<td>0.57</td>
<td>0.61**</td>
<td>0.66**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).

In investigating the relationship between independent variables (perceived ease of use, perceived value, learning climate and student-instructor interaction) and dependent variable (satisfaction on blended learning), the multiple regression model showed significant relationship between all variables. The multiple regression analysis is shown in Table 3 below.

Table 3: Multiple Regression Analysis

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependent variable Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived ease of use</td>
<td>0.25**</td>
</tr>
<tr>
<td>Perceived value</td>
<td>0.31**</td>
</tr>
<tr>
<td>Learning climate</td>
<td>0.21**</td>
</tr>
<tr>
<td>Student-instructor interaction</td>
<td>0.18**</td>
</tr>
<tr>
<td>F value</td>
<td>208.74</td>
</tr>
<tr>
<td>R²</td>
<td>0.68</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.68</td>
</tr>
</tbody>
</table>

* p<0.05, ** p < 0.01

All variables were found to be significant at 0.00 which is less than 0.01 ($p<0.01$). The $R^2$ for the model above is 0.68. Meanwhile, the adjusted $R^2$ is 0.68. Therefore, the variance of the model which consisted of independent variables (perceive ease of use, perceive value, learning climate and student-instructor interaction) contribute on students satisfaction on blended learning is at 68 percent and another 32 percent may be contributed by the other factors. Based on the result, it was found that perceive value has the most significant contribution on students satisfaction on blended learning ($\beta= 0.31$, $p<0.01$). Similar to previous study conducted by Entmer et al. (2008), perceived value was found to be the highest factor that influence students’ satisfaction on blended learning. Specifically, when students perceived their learning as relevant, interesting and enjoyable, the value of learning satisfaction increases, thus making blended learning more useful. This is followed by perceived ease of use ($\beta= 0.25$, $p<0.01$) which were found to have second highest influence on blended learning satisfaction. As perceived ease of use reflect the level of students’ performance due to blended learning is easy to operate and free from effort (Wu & Liu,
2013), this factor is important in determining the satisfaction of its users. Specifically, the result shows that the students will be more satisfied if they feel the blended learning is useful and provide more benefits to them. Since most current students are generation Y they can be more flexible and most of them have experienced first hand blended learning rather than traditional learning. The result of this study supported previous studies conducted by Joo, Lim, and Kim (2011); and Sahin and Shelley (2008). The third unique contribution is learning climate ($\beta=.21$, $p<0.01$). Similar to Tennyson (2010), this study’s result shows a positive learning climate that encourage the exchange of ideas, new information and knowledge as it is depends on trust and cooperation between students. Therefore, learning climate is one factor that affect students’ satisfaction on blended learning. Last but not least, is student- instructor interaction ($\beta= .18$, $p<0.01$). This study reveals similar result to Sher (2009). The study also suggested that the interaction between the students and the instructor includes of instructor delivering information, support the students as well as provide feedbacks on students’ works. Furthermore, this can include the participation between students and instructor using methods such as asking questions and communicating on any activities that related to the course. Thus, H1, H2, H3 and H4 are supported.

As a conclusion, this study would provide significantly to the Ministry of Education in Malaysia, higher education institutions, academics, community and nation as a whole because students are our future leaders. Therefore, they need to be well exposed on the importance of blended learning as one of the new approach in learning. For education institutions and academics blended learning serves as an alternative to learning from the traditional perspective. Blended learning can enhance the quality of learning by attracting students and giving a better platform and exposure. The results of this study suggested that additional directions for future research. The results of this study would not be used to generalize to other population as students from other programs in other faculties might have different perceptions on satisfaction on blended learning. Therefore, for future research, the researcher can conduct robust analysis to enhance the statistics with good performance for data drawn from a wide range of probability distributions, especially for distributions that are not normal. Other than that, it is suggested that the researcher should include respondents’ across faculties or across universities as a larger samples and be able to carry out a comparative study in order to make this study more meaningful for education sector especially in Malaysia.

References


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Prospects of Blended Learning Implementation at Technical University
Prospects of Blended Learning Implementation at Technical University

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Abstract

The present paper explores the integration of a blended learning course in the process of learning English as a second language at the technical university. We overview the difference between traditional, web facilitated, blended learning and online course; the implementation of the blended learning course in the process of learning English at the technical university. The article also investigates the benefits and drawbacks of blended learning and the possibilities of a blended learning course integration in the educational process. The results of the survey conducted prove that the integration of a blended learning course can be implemented successfully through a combination of online learning and face-to-face classes. The findings described will be useful to teachers and researchers working in this field to overcome the barriers, become more experienced and understand the main concept of blended learning.

Keywords: Blended learning; integration; information and communication technologies; e-learning; online course.

1. Introduction

Over the last 15 years the process of learning and teaching foreign languages has changed greatly. The world has become digital as well as an educational process. We cannot imagine the language classroom without interactive whiteboards, students’ mobile phones, electronic dictionaries and different apps which can be used in the learning process.

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New technologies are transforming our world, and instructors must be ready to integrate these technologies in class as learners have grown up playing computer games, watching video on YouTube and reading digital books. New means of communication have been created and we need to study how these new technologies can be used in teaching and learning foreign languages at universities.

Nowadays, modern information technologies have become an integral part of the educational system in many countries all over the world. This idea is reflected in the works of many researchers whose scientific interests lie within the scope of information and communication technologies in education: the importance of computer technologies integration in the learning process (Matukhin & Evseeva, 2014), the use of information and communication technologies for developing adult learners’ communicative foreign language competence (Balastov & Sokolova, 2015), using blogs in creating special opportunities for language learning (Buran, 2015).

Information and communication technologies tend to dominate in teaching and learning processes at modern technical universities. They are widely used for teaching various subjects as well as foreign languages. One of the forms of information and communication technologies is considered to be e-learning that is being implemented in the teaching process nowadays. However, e-learning alone cannot satisfy all the needs that the participants of the educational process have. Consequently, only the integration of traditional teaching methods and e-learning can lead to the desired results. Among various e-learning technologies blended learning is supposed to be the most effective and perspective one that should be implemented in the educational process at modern universities.

Different researchers have investigated different aspects of blended learning: methodological basics of blended learning in teaching English for academic purposes to engineering students (Matukhin, et al., 2014), e-learning impact on the academic performance of students and teachers (Lumadi, 2013), activity theory practice in open and distance learning, their implications for learning virtually (Nyoni, 2013), designing teaching activities of English writing courses for learners of English as a foreign language in the blended learning environment (Tang, 2014), blending learning in a web 2.0 world (Motteram & Sharma, 2009), case study on the effects of an L2 writing instructional model for blended learning in higher education (So & Lee, 2013).

Although there are numerous researches, concerning blended learning, the integration of blended online courses into the learning process of technical universities hasn’t been described yet. The authors of the present article are making an attempt to describe the opportunities of such integration and offer some practical guidelines for teaching engineering students a foreign language by means of electronic courses.

2. Literature Review

A literature review will be used to study different definitions of blended learning, the difference between a traditional, web facilitated, blended learning and online course; the implementation of a blended learning course in the process of learning English at National Research Tomsk Polytechnic University. Also the example of using the English course to teach engineering students will be provided.

Allen and Seaman divide all courses into four groups:

- Traditional course which doesn’t use online technologies. All the material is given orally or in a pen
- Web facilitated course uses web-based technologies. For example, web pages are used to provide the syllabus and assignments (1-29 % of the material is given online)
- Blended (hybrid) course combines online learning and face-to-face classes (30-79% is delivered online)
- Online course implies that most of all the content (more than 80%) is delivered online (Allen & Seaman, 2013).

Numerous researchers define blended learning as “a training method that combines the benefits of in-class learning and e-learning” (Matukhin, et al., 2014; Obskov, 2014).

The term “blended learning” combines the elements of face-to-face teaching, including personalized learning, social interaction and direct contact with the language, allowing greater variety and flexibility than traditional learning. Implementing blended learning in the language classroom implies not only online learning, but integrating the content into the lesson.

We should differentiate between blended learning and distance learning to prevent misunderstanding. Blended learning aims to complement face-to-face sessions, while distance learning exists on its own. Blended learning
implies that receptive skills, writing and grammar should be done individually and teachers should concentrate on speaking activities and explanations of the most difficult material, having face-to-face classes. Understanding the main concepts of blended learning will help to choose the material appropriate for class discussion and individual students’ work. Only well-prepared and professional teachers are able to create blended learning English courses focusing on listening, reading, writing, vocabulary, language practice, and pronunciation.

Blended learning has a number of advantages in comparison with traditional learning courses. One of the advantages of blended learning is that it is easily adaptable to learners’ needs. The adaptability comes from different ways how online resources can be used. The most important component of blended learning is its flexible course. If the teacher notices any problems that the learners have while studying the course, he/she can immediately solve these problems by changing the material and learning activities. Learners’ individual needs should be taken into consideration, otherwise even well-designed courses can fail. If the course is flexible it contributes to raising learners’ motivation.

Another benefit is that students, being involved in planning the course can successfully develop creative and critical thinking. Moreover, blended learning allows students to be independent, while studying outside the classroom any time they have opportunities and willingness to learn the language. Independent learning provides constant feedback without the teacher’s assistance. Students can easily find their results and see their progress. So the teacher’s role is changing from that of a lecturer to a facilitator who helps to monitor and assess learners’ progress, giving them an opportunity to study independently. Moreover, the learner’s role is changing as well. The great advantage is that learners become active participants of the studying process. The involvement of the learner in planning his/her own learning is feasible and important (Nizkodubov & Evseeva, 2015).

One more advantage of blended learning is that it reduces instructors’ workloads and they have more time to work with other material, taking into account the learners’ needs. It’s very important to have feedback from the learners, due to this they become much more interested in the process of communication with other learners outside the classroom. Blended learning allows the learners to do extra work, to learn important vocabulary and grammar structure before face-to-face classes, not after, to give them immediate feedback, to be motivated, interested in the results of studying.

Blended learning has disadvantages either. One drawback is that most online courses are designed in a similar way as their predecessors – face-to-face courses. They have the same material, the same number of credit hours, are led by the same instructor who has interaction with students face-to-face. Also, it takes a lot of teachers’ efforts to design online courses and to teach online. We consider that such courses must be designed by a team of professional programmers and teachers. Some more disputable questions are the following: Do all students want to be engaged in online learning? Do they have any alternatives if they are against? If they have problems with eyesight, what should they do?

3. Research Methodology

The paper outlines the methodology for the survey, including pedagogical objectives, task design, selection of a blended course, as an educational tool and its implementation in the learning process. We use the following methods in our research: the analysis, the review of literature, observing our own professional experience with data analysis.

According to the aim of this study, including investigation of blended learning to create additional opportunities for language learning, we’ve formulated the following pedagogical objectives:

- To evaluate the hypothesis that blended learning is an effective educational tool to learn and teach English at the technical university
- To design a blended learning course which allows students to learn English successfully
- To describe possible ways of teaching English to engineering students implementing blended learning courses
- To overview pros and cons of integrating blended learning in a language classroom

To achieve the first and the second objectives, we’ve conducted a research based on creating and using our own blended online course for teaching English at National Research Tomsk Polytechnic University. Today the
university provides web facilitated courses to over 14,000 students. About 30% of material students can get online. The next step is to implement blended learning in the learning process and in five years time to provide about 80% of online courses.

The following steps of implementing blended learning at TPU have been planned:

- Online lectures. Some lectures will be given only online in the form of webinars or high-quality lectures with tests designed by instructors
- Practical training will be provided in the form of webinars. All participants have opportunities to use a common desktop, to ask and answer questions, to show their work to other learners, to conduct a survey, and complete a test. This form of practical training displays opportunities for full traditional practical training replacement. Such online courses will be implemented only for the courses which don’t need laboratory equipment
- Masters’s programs need online courses as they imply more individual work

To evaluate the hypothesis that blended learning is an effective educational tool the E-learning Institute of Tomsk Polytechnic University conducted a survey to find out the views of teachers and students on the use of electronic courses in the educational process. More than 100 teachers and about 550 students participated in the survey. The results of the survey will be presented further in the article.

To achieve the third objective, we suggest one of the ways of implementing a blended learning course for teaching English to engineering students at Tomsk Polytechnic University. We have chosen one of the modules of the course “General English” taught to the second-year students of TPU which is called “Ecological issues”. In the traditional learning process 12 hours are allocated for classroom work and 12 hours are supposed to be for self-studying. In a blended learning course 6 hours of classroom work are replaced by activities in the e-learning environment while 12 hours are left for self-studying. Thus, 50 percent of the time, which was devoted to classroom work now move to e-learning. The activities that the students have to do in the e-learning environment are versatile, for example, writing essays, making presentations or discussing different problems on the topic of the module. Such activities as writing essays and making presentations are followed by peer-to-peer assessment which means that students give feedback to other students’ works according to defined criteria or rubrics. Peer-to-peer assessment enables students to take an active role in the management of their own learning as they monitor their work using internal and external feedback (Butler & Winne, 1995).

It should be mentioned that there is a close interrelation between classroom and e-learning components which implies that activities that students do in class are contained in e-learning environment and vice versa. Thus, a continuous feedback is provided to students, according to the results of the previous work.

After 4 months of implementing the online course intended for engineering students studying English as a foreign language we can describe the achievement of the fourth objective which includes the overview of the benefits and drawbacks of blended learning in a language classroom.

The advantages are the following:

1) Students’ online research skills have been developed and their critical thinking has improved.
2) Blended learning is independent learning, so students have more opportunities for studying anywhere and anytime.
3) Students have improved their reading skills, caused by a large amount of information given online.
4) They have enhanced writing skills, while posting their comments as well as completing writing tasks and tests.
5) Students’ interest and motivation to learn the English language have increased for the reason the course was tailored to suit the learners’ needs.
6) Watching the video has developed listening skills.

Nevertheless, there are still some barriers to online learning.

1) Students should be more disciplined to succeed in online courses.
2) Low retention rates in online courses.
3) Problems with eyesight.
4) The unwillingness of some students to learn English online, as online courses increase students’ mental and physical workload.
5) Lack of acceptance of online education by potential employers.

4. Findings and Discussion

The results of the survey conducted at Tomsk Polytechnic University show the attitude of both teachers and students to the integration of electronic courses in teaching and studying. They are the following. Almost all students of Tomsk Polytechnic University were engaged in e-learning activities. About 87% of students actively studied online lectures. About 80% of them passed successfully their individual tasks. 60% of respondents studied additional material online.

It is important to know how much time students and teachers devote to working with electronic courses. About 50% of students spent on this 1-3 hours a week, 27%, even spent more than 3 hours a week. For teachers the amount of time is bigger: 45% devoted 2-4 hours a week to the work with electronic courses and 33% of respondents spent online more than 4 hours a week.

Among the problems connected with online learning 51% of students and 37% of teachers called technical ones. In addition, 51% of students found impossible to follow strict deadlines and the same percent of teachers mentioned the lack of time for monitoring the students’ work in electronic courses.

More than 50% of students and about 90% of teachers participating in the survey agree that electronic courses are a very important part of teaching and learning and that they should be integrated into the educational process at the technical university. Almost all students found electronic courses very useful for their own learning. 95% of respondents appreciated the opportunity to have free access to the material and tasks anywhere and anytime. Moreover, 91% of teachers think that due to electronic courses, students become more involved in the learning process and 75% of teachers consider e-learning as an effective tool for increasing students’ academic performance.

5. Conclusion

To sum up, it is worth saying that blended learning as a combination of online learning and face-to-face classes should become a top-priority mode for teaching and learning foreign languages in modern conditions. The importance of blended learning integration is justified by the fact that learning foreign languages imply compulsory communication activities which can be realized both in the classroom and in the e-learning environment. Students get the opportunity to develop their communication skills outside the classroom by means of online interaction with each other while discussing issues in forums and chats and doing other activities.

Furthermore, blended learning provides a number of important advantages for both teachers and students, making them active participants of the learning process responsible for the results of their own work.

Despite the fact that the development of electronic courses is time consuming at the first stage, it allows teachers to optimize their time and maintain the quality of the teaching process. The suggested learning mode helps to keep pace with the time and correspond to new requirements of the educational system where information technologies and the use of online resources play a vital role.

References

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