KNOWLEDGE MANAGEMENT THROUGH BLENDED LEARNING

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Abstract: *This paper presents the role of Blended learning approach in Knowledge management and its effective impact in courses on Technical faculty in Cacak. Over the years blended learning has been proven as the most effective and cost-effective teaching practice as it combines online and face-to-face learning settings to help learners learn. Using different evaluation methods a conclusion has been made of what the students want the most as a form of educational resource.*

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1. INTRODUCTION

Blended learning is by definition a combination of web and face-to-face interaction between a learner and a teacher, so it is utilizing best of both instructional worlds. Garrison and Kanuka [1] defined blended learning approach as a "thoughtful integration of classroom face-to-face learning experiences with online experiences". They also stated that there is no defined standard as to how much or what part of courses go online as it varies widely.

Knowledge management addresses learning aspart of knowledge sharing processes and pays more attention to specific forms ofinformal learning (e.g. learning in a community of practice) or to providing access tolearning resources or experts (e.g. knowledge bases)[2].Knowledge management is recognized as the management of the 21st century, thereforeunderstanding the knowledge management processes and factors effecting success andfailure of knowledge management processes is an important key to help managersidentify and understand what is required to make knowledge management work [3].

The important role that information technology plays in our everyday lives and development of knowledge management systems marks a limitation of traditional teaching approach. Students have often become more "digitaly literate" than their teachers. Didactical rectangle, once introduced in pedagogical theory by Comenius [4] nowday has evolved in a way that technology component (once just a bridge between learning, teaching and content) often overtakes the whole process of education.

Dziuban [5] marked that there is a number of potential advantages to blended learning that are emerging. Some of these revolve around accessibility, pedagogical effectiveness, and course interaction. In [6] is shown that an additional benefit often reported in blended cases is an increase in interaction over what students and faculty typically perceive in face-to-face courses.

Technical faculty in Cacak introduced its Learning Management System (LMS) more than five years ago, with main objective to introduce blended learning to its practice. In the beginning teachers used the system only for distributing learning content, but soon after they started using its other services on their own initiative. Today it consists of 136 courses and approximately 2100 active students.

2. LEARNING FRAMEWORK

Learning is the process of acquiring new knowledge, skills and awareness and taking on their habits. Education is often considered to be a synonym for learning, but it should be comprehended in a broader sense. The term education comprises all deliberate and systematic activities designed to meet learning needs. Education is understood to involve organized and sustained communication designed to bring about learning.

Khan's framework [7] (Figure 1)serves as a guide to plan, develop, deliver, manage, andevaluate blended learning programs. Organizationsexploring strategies for effective learning and performancehave to consider a variety of issues to ensure effectivedelivery of learning and thus a high return on investment.

Fig. 1. Khan's Octagonal Framework

The Management dimension [8] deals with issues related tothe management of a blended learning program, such asinfrastructure and logistics to manage multiple deliverytypes. Delivering a blended learning program is more workthan delivering the entire course in one delivery type. Themanagement dimension also addresses issues likeregistration and notification, and scheduling of the differentelements of the blend.

Mayes and Freitas [9] organised learning theories into three broad groupings: associative, constructivist and situative:

- In associative models of learning, it is stated that people learn by association, initially through basic stimulus-response conditioning, later through the capacity to associate concepts in a chain of reasoning, or to associate steps in a chain of activity to build a composite skill;
- Constructivist model of learning implies that people learn by active construction of ideas and building of skills through exploration, experimentation, receiving feedback, and adapting themselves accordingly;
- In situative models of learning, it is stated that people learn through participation in communities of practice, progression through observation, reflection, menthorship, and legitimate peripheral participation in community activities.

All of these theories are concerned and implicated when blended learning is used.

The effectiveness of interactive communicaion is conditioned by the compatibility of those who communicate, from the perspective of the level of knowledge, experience, share values and type of behaviour [10].

Integrated blended learning approach require teacher's additional effort in creating e-resources. Traditional (classroom) learning enviroment is still the foundation of the instructions, which are further expanded to computer mediated learning enviroment through asinchronous (documents, forums etc.) and synchronous (chat, quzzes etc.) means. Basic blended learning components are presented in the following figure.

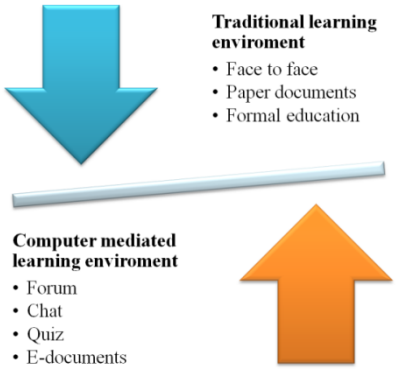

Fig.2. Basic blended learning components

90% of surveyed students has allocated three most appropriate electronic resources: lessons, files (.doc, .pdf, .ppt etc.) and quizzes. All of the selected imply that constructivist model of learning is currently best fitted, but when students were asked which resources their ideal course should contain, 74% choosed quiz, 68% .pdf files, 65% forums and 37% wiki pages. This result implies that they are more attracted to situative model, or in best case to a combination of both. Results are shown on following tableandfigure.

Table 1. Students attraction to different e-resources

Resource	Learning theory		
	Associative	Constructivist	Situative
Forum	65	30	30
Chat	54	25	60
Lesson	55	17	63
Quiz	50	15	60
Web page	40	17	45
Text page	35	29	6
.ppt file	30	30	4
.pdf file	30	45	3
.doc file	30	30	4
Wiki	35	20	5
Workshop	26	40	45
E-book	25	59	35
SCORM	30	35	40

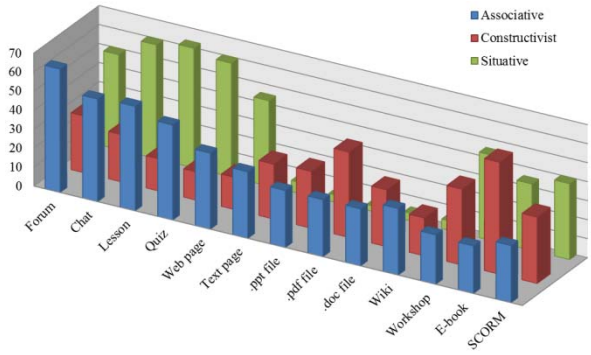

Fig. 3. Students attraction to different e-resources

3. STUDENT ATTITUDE AND PERFORMANCE EVALUATION

In his paper, Willet [11] concluded that while there is much variation in blended courses, one finding that appears to be consistent is student and teacher satisfaction with this modality. Both students and teachers are positive regarding the flexibility and convenience and the perceived increase in interaction they have with blended courses. Enjelvin [12] states "It is clear that while students value face to face teaching and say that they do not want technology to replace it, they also recognise the benefits of the integration of the two".

Haywood [13] indicates that while there has been a great deal of interest in the different behaviour of male and female students in fully online discussions, many studies of mainstream blended learning enviroments report no significant gender differences.

Following figure present results of overal student satisfaction and average monthly access to Faculty's LMS.

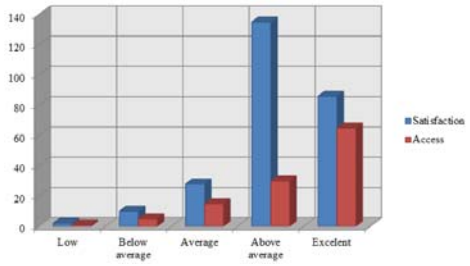

Fig. 4. Student satisfaction and average monthly access

Large number of students suggested the need for more multimedia content (such as video material).

Evaluations of blended learning which have attempted to show correlations between student performance and their use of technology are relatively infrequent. In part this rises from the difficulty of isolating any single variable in dynamically complex educational systems. Evaluations frequently looked at student reactions to and satisfaction with new learning approach as measures of success and they failed to gather

meaningful evidence of improvement in student learning outcomes. Kember [14] argues that experimental research designs are difficult to achieve in naturalistic settings as control groups are difficult to establish practically or ethically.

An attempt to evaluate advantages of blended learning was made during 3 months period of fall semmester 2011. Same course (Methodics of Technics) was being tought to two groups of students. Control group of 18 students were learning traditionally (face to face) and the experimental group of 20 students used blended learning. Except individual feelings of easier and more complete learning experience that students of the experimental group had, no statisticaly significant better outcome results were made by them at the end of the semester. This could be due to the fact that purpose of the subject is gaining practical skills for future teachers and development of their communication competencies.

4. LEARNING MANAGEMENT SYSTEM

Faculty's LMS is based on free Moodle 1.9.9+ platform under Linux OS, which prooved its stability, although the plan is to move on to Moodle 2.2 in near future. Monthly average is aprox. 125000 entries, which rises to over 220000 in winter months, and falls to arround 20000 during summer break. These numbers lineary rise every year, so it is expected to achieve 300000 entries/month to the end of year 2012. The following figure shows graphical representation of system load in last 3 years.

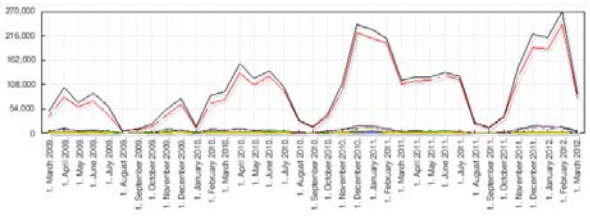

Fig.4. LMS system load in past 3 years

System demands very "light" hardware base, so the need for the new server appeared after almost five years. It is being administrated by two administrators, both from teaching staff.

The following figure represents a data gathered when students were asked about the location from where they access LMS.

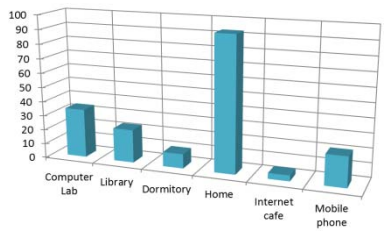

Fig.5. Locations of accessing LMS

Such large number of students that access the LMS from their homes is partly due to the fact that Faculty is located in one of the regional centers.

The next figure represents the structure of Internet connection types for accessing the System.

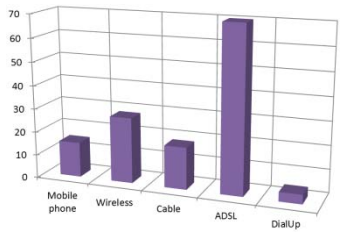

Fig.6. Structure of Internet connection types

Practically 98% of the students use some sort of permanent Internet access. Last year (2011) was the first when every undergraduate freshman student had a personal computer and Internet access. This fact supports the position that the traditional classroom education should be adapted to new social demands and enviroment by the introduction of blended learning as the appropriate teaching practice alternative.

5. CONCLUSION

Many institutions and practitioners are attempting to engage knowledge management with blended learning and are doing it successfully. Traditional school system must be adapted to new "digitally literate" students. Cooperation and international experience exchange are fundamental for future improvement of blended learning. As the practice has confirmed, the teachers adopt advantages of this approach fairly easily and quickly, and increase the application of collaborative learning within their subjects.

The results that blended learning approach gave us in practice are more than satisfactory. Since it was introduced, students motivation has increased significantly, and teachers work became more student-oriented. The obvious advantages of this cost-effective method imply that the Faculty will continue to use and upgrade it in order to facilitate and improve students' achievements.

Further research and pedagogy experiments are required to standardize this method of education and to make it a part of everyday teaching practice in schools in near future.

6. REFERENCES

[1] D. R. Garrison, H. Kanuka: *Blended learning: Uncovering its transformative potential in higher education*, Internet and Higher Education, Vol. 7, No. 2, January 2004. pp. 95-105, ISSN 1096-7516.

[2] L. Efimova, J. Swaak:*KM and (e)-learning: towards an integral approach?*, Proceedings of 2nd EKMF Knowledge Management Summer School, pp. 63-69, Sophia Antipolis, Nice, September 2/6 2002. Retrieved 2011, 10 November, https://doc.freeband.nl/dsweb/Get/Document-24262/km_learning_KMSS02.pdf

[3] A. Anongkhanatrakul: *Analysis of Organizational Knowledge Management Processes*, Proceedings of 2nd EKMF Knowledge Management Summer School, np., Sophia Antipolis, Nice, September 2/6 2002. Retrieved 2011, 10 November, https://doc.freeband.nl/dsweb/Get/Document-24262/km_learning_KMSS02.pdf

[4] J. A. Comenius: *Große Didaktik*, Klett-Cotta, ISBN 3-608-91372-6,Stuttgart, 1992.

[5] C. Dziuban, P. Moskal, J. Hartman: *Higher education, blended learning and the generations: Knowledge is power-no more*, Research Initiative for Teaching Effectiveness, University of Florida, Orlando, 2005. Retreived 2011, 12 June, http://commons.ucalgary.ca/documents/chuck.doc

[6] G. L. Waddoups, S. L. Howell: *Bringing online learning to campus: The hybridization of teaching and learning at Brigham Young University*, International Review of Research in Open and Distance Learning, Vol. 2, No. 2,January 2002.np., ISSN 1492-3831.

[7] B. H. Khan: *Flexible Learning in an Information Society*, Information Science Publishing, ISBN 978-1599043265,London, 2006.

[8] H. Sigh: *Building Effective Blended Learning Programs*, Educational Technology, Vol. 43, No. 6,December2003.pp. 51-54, ISSN 0013-1962.

[9] T. Meyes, S. Freitas: *Review of e-learning theories, frameworks and models*, JISC e-Learning Models Desk Study, Bristol, 2004. Retrieved 2012, 5 January, http://www.jisc.ac.uk/uploaded_documents/Stage%202%20Learning%20Models%20(Version%201).pdf

[10] C. Stefanescu, L. Popa: *Managerial Communication*, MPRA Munich Personal RePEc Archive, paper No. 7172, Spiru Haret University, Faculty of Management, Braşov,2008. Retrieved 2012, 25 February, http://mpra.ub.uni-muenchen.de/7172/1/MPRA_paper_7172.pdf

[11] H. G. Willet:*Not one or the other but both: hybrid course delivery using WebCT*, The Electronic Library, Vol. 20, No. 5, Bingley, December 2002.pp. 413-419, ISSN 0264-0473

[12] G. Enjelvin:*Investigating VAT (value-adding technologies) and e-effectiveness in a French department*, Journal of Further and Higher Education, Vol. 29, No. 2, Oxford, March 2005.pp. 155-167, ISSN 1469-9486

[13] J. Haywood, H. Macleod, D. Haywood, N. Mogey, W. Alexander: *Student views of e-learning: A survey of university of Edinburgh WebCT Users*, University of Edinburgh, Edinburgh, 2004., Retrieved 2012, 5 January, http://homepages.ed.ac.uk/jhaywood/papers/surveyresults2004.pdf

[14] D. Kember: *To control or not to control: The question of whether experimental designs are appropriate for evaluating teaching innovations in higher education*, Assessment and Evaluation in Higher Education, Vol. 28, No. 1, Oxford, January 2003.pp. 89-101, ISSN 0260-2938

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