

# LMS MOODLE BENEFITS REFLECTED BY STUDENTS' PERFORMANCE IN BLENDED LEARNING COURSE

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## ABSTRACT

The use of technologies has its place in modern education, particularly language education, at any given level. The general tendencies towards the widespread use of technologies in education are needed but not sufficient if exclusively based on their motivational aspect. In modern society, there is a strong need to use technologies wisely and purposefully, exploiting their benefits in order to enhance educational processes. The very perspective and purposeful way of integrating technologies in education is the use of various Learning Management Systems (LMSs). Nowadays, the LMS Moodle is used by many schools and universities. The main focus of this study is to bring the results of the analysis of the impact of the LMS on students' performance in a blended learning type of English Lexicology course taught at Constantine the Philosopher University in Nitra, Slovakia and created in the LMS Moodle environment. The present study aims to bring a valuable insight into the use of the potentials that the LMS Moodle provides for blended language education.

## KEYWORDS

CALL (Computer Assisted Language Learning), LMS (Learning Management System), Moodle (Modular Object-Oriented Dynamic Learning Environment), English Lexicology, Blended Learning.

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## 1 INTRODUCTION

There are various types of software that enable the implementation of Computer Assisted Language Learning (CALL) within the educational process. According to Burgerová and Adamkovičová (2014), the most popular types of software are diverse LMSs (Learning Management Systems). The authors investigated Slovak universities in order to find out the most popular and the most frequently used LMS. It was found that most Slovak universities use LMS Moodle. Cimermanová (2013) conducted a survey among Slovak University teachers using LMS Moodle and found out that the system was positively evaluated because of its simplicity, user-friendliness as well as the fact it is open source software. LMS Moodle is also used at Constantine the Philosopher University in Nitra, Slovakia, where the research presented in this paper was conducted.

The current version of LMS Moodle can be characterised as follows ([moodle.org](http://moodle.org), n.d., n.p.):

*“The heart of Moodle is a set of courses that contain activities and resources. There are about 20 different types of activities available (forums, glossaries, wikis, assignments, quizzes, choices (polls), SCORM players, databases etc.) and each can be customised in numerous ways. The main power of this activity-based model comes when combining activities into sequences and groups, which can*

*help guide participants through learning paths. Thus, each activity can build on the outcomes of the previous ones. There are a number of other tools that make it easier to build communities of learners including blogs, messaging, participant lists etc., as well as useful tools like grading, reports, integration with other systems and so on.”*

The most important fact is that the philosophy of LMS Moodle is based on constructivism, social constructivism, and connectivism which means that it is a suitable technologically-based platform for ubiquitous CALL (c.f. Veselá, 2012).

This study proves that using the potentials of LMS Moodle in a blended learning language course has a positive impact on students' performance.

## **2 RESEARCH PART**

### **2.1 Research Aim**

The research was aimed at finding the relationship between exploiting the potentials of LMS Moodle for language education in a blended learning environment and the final study results of students.

### **2.2 Research Question**

Is there a relationship between exploiting the potentials of LMS Moodle in the language course and study results of students?

### **2.3 Settings and Participants**

The case study was conducted at the Department of Language Pedagogy and Intercultural Studies, Faculty of Education, Constantine the Philosopher University in Nitra, Slovakia in the winter semester of 2015/2016. The course lasted from 21.09.2015 to 19.12.2015 (13 weeks).

The participants of the study were 29 teacher trainees of English language and literature in their second year of study. The participants were divided into 2 groups within the English lexicology course. As for the organization of the English lexicology course, there was a lecture on Tuesdays from 13:00 to 14:40 and then 2 seminars took place each Tuesday. The first seminar started immediately after the lecture, i.e. 14:45-16:15 (18 students) and the second seminar lasted from 16:30 up to 18:00 (11 students). Both, lecture and seminar lasted for 90 minutes.

The course was led as a blended learning course, thus it consisted of a face-to-face phase and a CALL phase. Face-to-face lectures on English lexicology were not obligatory but were attended by most of the students. The seminars took place in a computer classroom, i.e. each student was able to use a computer with an active Internet connection; additionally, students were encouraged to use their own laptops when it had been more convenient for them, as there was a Wi-Fi connection available in the classroom. The attendance at seminars was compulsory, however, only approximately 30 minutes of the seminar were held as a traditional, contact lesson. The structure and phases of the seminar were more or less the same every week; i.e. each seminar started with a short discussion about the assignments from the previous seminar. The discussion about the current topic that was discussed during the lecture followed. Students were then given instructions about the new assignments in the LMS Moodle. After that phase, students had 2 opportunities: to work on the assignments in the classroom until the end of the seminar (the teacher was available there and ready to answer any questions, to guide and give advice), or to leave the classroom and work on the assignments anytime and anywhere they wished or had the opportunity to be. The submission deadline was every following Tuesday at 13:00.

### **2.4 Research Method**

The study employed a comparative analysis of LMS Moodle records and results of students' performance.

### **2.5 Research Results and Interpretation**

English lexicology was taught as a blended learning course, thus face-to-face interaction was accompanied by study on an online LMS Moodle course, which obviously should also support students' autonomous learning. In terms of the potential development of autonomy and independence, the focus was on determining if autonomous study with the help of the online course content had an impact on learner performance in the final examination.

Logs of all students under the study were downloaded, hits by each student during the term were counted and the relationship between the hits by the students and their score in the final exam was statistically processed via correlation analysis. To reach the most objective data, only the first attempts of the exam (out of three allowed) were taken into consideration, since the second and third attempts might have not been influenced by the blended character of their studies.

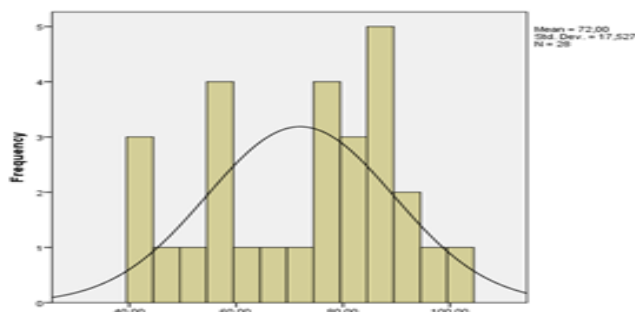
Table 1 below presents a descriptive set of statistics of the frequency of variables (i.e. final exam score in points of each individual student and number of hits by each of the students). Firstly, we aimed to ascertain the normality (symmetric distribution) of the dataset. The symmetric distribution of the dataset was investigated via the Skewness and Kurtosis methods. On the basis of these analyses it was found that the data is not symmetrically distributed since the Kurtosis in the variable "Final exam score in points" is beyond the set interval (i.e. from -1 to 1); more specifically the value of KU is -1.091.

**Table 1** Descriptive statistics

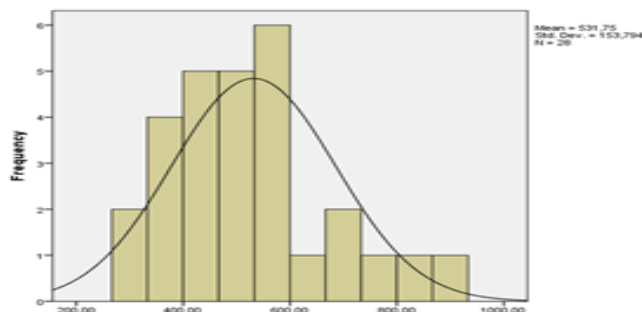
Factor	N	Min	Max	M	SEM	SD	SK	KU
Final exam score in points	28	42	95	71.82	3.31	17.53	-0.321	-1.091
Number of hits		293	906	531.75	29.06	153.79	0.849	0.425

\*Note: N-number; Min-minimal score; Max-maximum score; M-mean; SEM-standard error of mean; SD-standard deviation; SK-skewness; KU-kurtosis

For better illustration, we also provide histograms (Graph 1 and Graph 2 below) which show us that the data in the sample does not fulfil the requirements of normal distribution of the dataset. Furthermore, from Table 1 below it can be seen that the sample does not fulfil the requirement of a minimum number of subjects in the research sample (which is 120). Consequently, these were the reasons why a parametric test in order to determine the correlation coefficient was not used; hence, the nonparametric test was employed.



**Graph 1** A histogram of distribution of a dataset referring to the final exam



**Graph 2** A histogram of distribution of a dataset referring frequency of hits by students

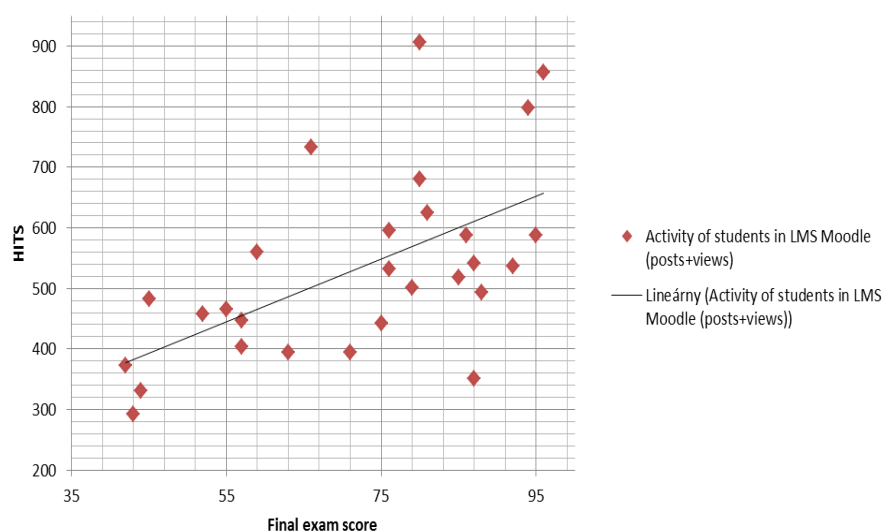
Table 2 below presents the final results of correlation analysis. In order to determine the relationship between the number of hits by students in the online course during the term and the final exam score, we used a Spearman's correlation coefficient nonparametric test. It can be seen from Table 2 that the value of Spearman rho is 0.613, which means that there is a strong correlation.

**Table 2** Correlation Analysis

Factor	N	M	SEM	SD	r
Final exam score in points	28	71.82	3.31	17.53	<b>0.613</b>
Number of hits		531.75	29.06	153.79	

\*Note: N-number; M-mean; SEM-standard error of mean; SD-standard deviation; r-Spearman's correlation coefficient

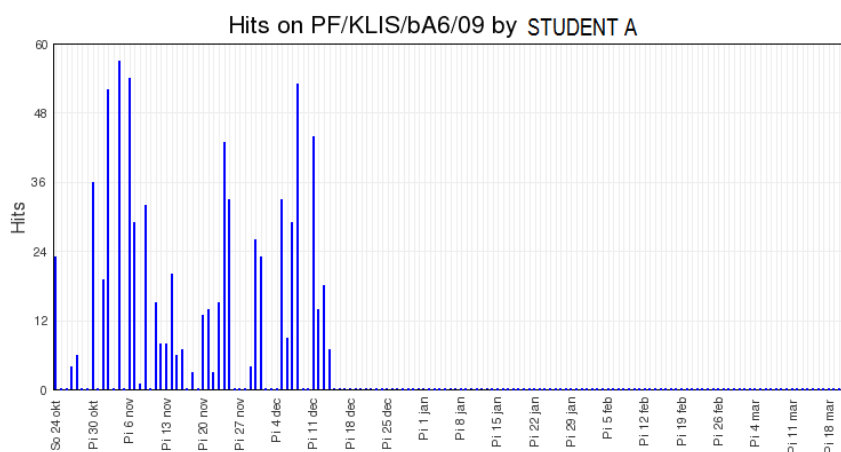
For better illustration, we provide Graph 3, which distinctly demonstrates the correlation analysis. Thus, it may be concluded that within the limitations of the present case study, there is a statistically strong relationship between the number of hits by students (i.e. both, views and posts) and the final test score. Therefore it can be stated that the correlation results proved that students who worked with the study materials demonstrated better performance on the final examination than those who had not worked with the online course very often.



**Graph 3** Final exam score in points of each individual student versus number of hits by each of the students

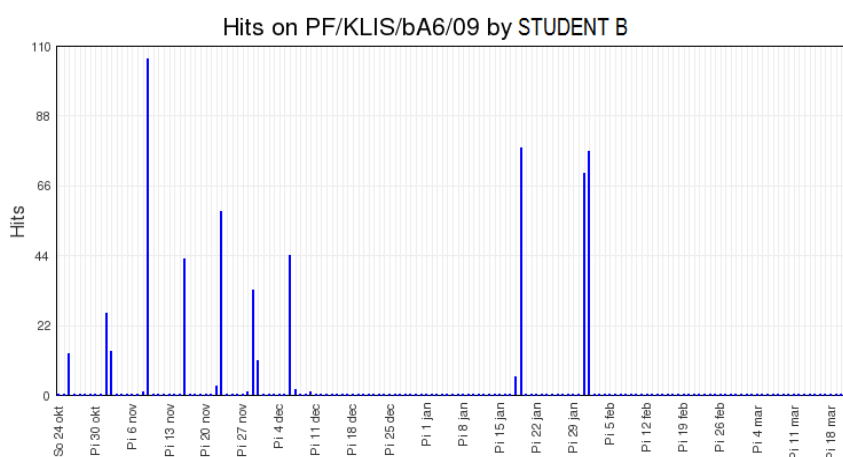
In order to support statistical results, a comparison of two students under the study is provided. Student A was one of the most active participants in the online course (as well as during the face-to-face phase of the course); i.e. the student with one of the highest number of hits (857 hits; i.e. 617 views, 240 posts) during the term. Furthermore, Student A reached the highest score in the final exam (96 out of 100 points). On the other hand, Student B is a student with both, the least number of hits (293; i.e. 100 views, 193 posts) during the term (up to 19.12.2015) and the lowest score in the final examination (43 out of 100 points).

To contrast the study performance of both Student A and Student B on the course, Graph 4 and Graph 5 are provided. Graph 4 is a statistical report about the hits by Student A in the course. It can be seen that Student A studied with the help of the online course very frequently, the highest number of recorded hits was 53 on November 3, 2015.



**Graph 4** Logs of one of the most active participants of the course

As far as Student B is concerned, it is evident from Graph 5 that this student did not use the content from the online course very often which mirrors his/her performance in the final examination. The high number of hits was recorded in January and February because Student B was most probably revising for the final exam (he/she did not pass the exam the first time on January 20, 2016, so he/she had to retake the exam on February 2, 2016).



**Graph 5** Logs of one of the least active participants of the course

In addition, there is given a closer look at the study performance of Student A and Student B by showing the activity reports obtained from LMS Moodle. A random topic was chosen in order to show the differences between the study activities of both students more precisely.

Figure 1 shows an activity report of Student A within Topic 7. Within the entire Topic, there are only two sources without a view, i.e. URL: Conversion web resource and forum on Word formation. The “Labels” are not study materials as such, they serve to divide study contents and group them into thematically oriented units. Student A downloaded a Lecture file one day before the lecture actually took place, i.e. on Monday evening. It most probably means that Student A was interested in the new topic and wanted to see the content beforehand.

Topic 7		
Label	-	
Lecture 6	1 views	Pondelok, 16 november 2015, 8:22 (152 days 18 hours)
Conversion	2 views	Nedela, 22 november 2015, 7:53 (146 days 19 hours)
Conversion web source	-	
Assignment 17	Grade: 1.00 / 1.00	Utorok, 17 november 2015, 7:22 (151 days 19 hours)
Assignment 18	Grade: 1.00 / 1.00	Utorok, 17 november 2015, 8:32 (151 days 18 hours)
Assignment 19	Grade: 1.00 / 1.00	Utorok, 17 november 2015, 9:19 (151 days 17 hours)
Assignment 17 - key	2 views	Pondelok, 14 december 2015, 9:55 (124 days 17 hours)
Assignment 18 - key	2 views	Pondelok, 14 december 2015, 9:56 (124 days 17 hours)
Assignment 19 - key	2 views	Pondelok, 14 december 2015, 9:58 (124 days 17 hours)
Label	-	
Quantitative changes	3 views	Nedela, 6 december 2015, 5:48 (132 days 21 hours)
Acronymfinder	2 views	Nedela, 22 november 2015, 10:26 (146 days 16 hours)
Netcronym dictionary	1 views	Nedela, 22 november 2015, 9:56 (146 days 17 hours)
Emoticon dictionary	1 views	Streda, 4 november 2015, 8:53 (164 days 18 hours)
Assignment 20	Grade: 1.00 / 1.00	Streda, 18 november 2015, 11:17 (151 days 4 hours)
Assignment 21	Grade: 1.00 / 1.00	Streda, 18 november 2015, 11:29 (151 days 3 hours)
Assignment 22	Grade: 1.00 / 1.00	Streda, 18 november 2015, 3:48 (150 days 23 hours)
Assignment 23	Grade: 1.00 / 1.00	Streda, 18 november 2015, 3:51 (150 days 23 hours)
Assignment 24	10 views	Nedela, 15 november 2015, 9:23 (153 days 17 hours)
Assignment 20 - key	2 views	Pondelok, 14 december 2015, 9:45 (124 days 17 hours)
Assignment 21 - key	2 views	Pondelok, 14 december 2015, 9:48 (124 days 17 hours)
Assignment 22 - key	2 views	Pondelok, 14 december 2015, 9:53 (124 days 17 hours)
Assignment 23 - key	2 views	Pondelok, 14 december 2015, 9:54 (124 days 17 hours)
Forum / Wordformation	-	

**Figure 1** Activity report of Student A within randomly chosen Topic

\*Note: Pondelok=Monday; Nedel'a=Sunday; Utorok=Tuesday; Streda=Wednesday

Student B's activity within the same Topic 7 is demonstrated in Fig. 2 below. As for the "obligatory" study resources, i.e. resources necessary to do the assignments, Student B accessed a Lecture file only; the other two necessary resources, i.e. Pages (Conversion and Quantitative changes) remained without any access by the student; however, he/she accessed the Lecture on January 20, 2016, i.e. before his/her first attempt of the final examination. It is not clear how Student A did the Assignments since he/she never accessed the lecture file during the week in which he/she was submitting the assignments. He/she might either have copied the entire set of assignments from classmates or searched out the information on the Internet. Moreover, Student B did not submit Assignment 20; however, there are more views of each of the assignment keys by Student B. We downloaded the logs of the observed student and we found that Student B accessed all of the Assignment keys before the final exam attempts only, hence he/she never viewed an Assignment key after it was opened to check if the submitted Assignments were correct. Student B also never accessed "extra" authentic resources; neither had he/she viewed a discussion forum in Topic 7.

Topic 7		
Label	-	
Lecture 6	1 views	Streda, 20 január 2016, 1:49 (88 days 13 hours)
Conversion	-	
Conversion web source	-	
Assignment 17	Grade: 1.00 / 1.00	Utorok, 17 november 2015, 7:18 (151 days 20 hours)
Assignment 18	Grade: 1.00 / 1.00	Utorok, 17 november 2015, 7:25 (151 days 19 hours)
Assignment 19	Grade: 1.00 / 1.00	Utorok, 17 november 2015, 9:17 (151 days 18 hours)
Assignment 17 - key	3 views	Utorok, 2 február 2016, 1:47 (75 days 13 hours)
Assignment 18 - key	3 views	Utorok, 2 február 2016, 1:47 (75 days 13 hours)
Assignment 19 - key	3 views	Utorok, 2 február 2016, 1:47 (75 days 13 hours)
Label	-	
Quantitative changes	-	
Acronymfinder	-	
Netcronym dictionary	-	
Emoticon dictionary	-	
Assignment 20	Grade: -	
Assignment 21	Grade: 1.00 / 1.00	Streda, 18 november 2015, 11:26 (151 days 3 hours)
Assignment 22	Grade: 1.00 / 1.00	Streda, 18 november 2015, 2:29 (151 days)
Assignment 23	Grade: 1.00 / 1.00	Streda, 18 november 2015, 3:50 (150 days 23 hours)
Assignment 24	1 views	Utorok, 10 november 2015, 1:15 (159 days 14 hours)
Assignment 20 - key	5 views	Utorok, 2 február 2016, 4:37 (75 days 10 hours)
Assignment 21 - key	6 views	Utorok, 2 február 2016, 4:46 (75 days 10 hours)
Assignment 22 - key	4 views	Utorok, 2 február 2016, 4:37 (75 days 10 hours)
Assignment 23 - key	4 views	Utorok, 2 február 2016, 4:37 (75 days 10 hours)
Forum / Wordformation	-	

**Figure 2** Activity report of Student B within randomly chosen Topic

\*Note: Utorok=Tuesday; Streda=Wednesday

It may be concluded that the activity of Students A and B in the online part of the blended learning course on English lexicology was mirrored at the final examination. It is important to state that Student A is an excellent student who reaches high scores in all subjects which means that he/she is a highly motivated student. On the other hand, Student B is a student who frequently does not attend courses and his/her score is rather low. These are also important factors when predicting student performance, however, the statistical results proved that the more frequent the activity on the online course, the higher the final exam score.

To sum up, it can be claimed that frequent autonomous learning with the help of the e-learning course content has a positive impact on the study performance of students within the case study. This final assumption reflects and supports the ambition to help those who want to know more.

### 3 DISCUSSION

Since 1998, the year when Warschauer and Healey wrote their study on the merits of CALL, technologies have radically changed. However, it can be claimed that the technologies have not lost any of the beneficial aspects of CALL described by the authors; moreover, many new potentials have occurred since then. Nearly ten years later, Cabrini (2007) claimed that teachers at that time had the opportunity to gain students' attention by using sounds, different types of letters, images, etc., which is more effective since it helps the learners of a language to visualize the content. We are convinced that this potential is still of particular importance and is still present in understanding of CALL nowadays.

As for the more recent studies, in line with Riasati, Allahyar and Tan (2012), who analysed a number of studies concerned with the issue of technology in language education, it was proven that our blended CALL model supported both the learner-centred approach and collaborative learning. Moreover, the authors perceive an assessment shift (i.e. 21<sup>st</sup> century learning highlights the development of learners' autonomy) as a beneficial aspect of CALL. Such a development is to also be achieved by the overall assessment shift from teacher to self and peer evaluation. It can be claimed that within the English Lexicology blended CALL course, students were encouraged to self-assess themselves.

As a matter of fact, Cabrini (2007), Riasati, Allahyar and Tan (2012), AbuSeileek, and Abu Sa'aleek, (2012), and Bani Hani (2014) stressed that the big pitfalls of CALL are technological problems and availability of computer hardware and software. Moreover, these authors claim that the nature of the

Internet as a form of new technology is an obstacle itself. This is connected with technical problems, such as connectivity or limited access, etc. Taking the limitations of the case study into consideration, it can be assumed that this obstacle is not a big problem nowadays. Rapid development of technologies make them more and more reliable and as stated, students mostly submitted assignments on time, and from the results of the analysis of quantitative LMS Moodle records it was obvious that students in our research were able to access the internet and technological device any time they needed.

A very important benefit defined by Bani Hani (2014) and Han (2008, cited in Tafazoli and Golshan, 2014) is learners can use CALL content inside as well as outside the classroom which was highly appreciated by our students, who often emphasized that the combination of face-to-face and CALL phases, which could have been performed anywhere and anytime was the most proper solution for them, the fact proven by the research that the student who managed to exploit this benefit of blended learning better performed in the final exam than the student who failed to use this potential.

We agree with Blicek et al. (2019) that pedagogy behind the blended learning courses is highly important, therefore students should be encouraged to be active to yield as much profit from this type of learning environment as possible.

## CONCLUSION

Analysis of the quantitative LMS Moodle records provided the results of the students' activities on the course from an objective point of view. It was found that the students in the study used the enormous potential of flexibility and were actually studying even late into the night or early morning hours as well as during the weekends and holidays. It was also proved that the more frequent the activity of the students on the online course, the higher their final exam score. It seems important here to stress the fact that the results from the case study cannot be generalized; however, it can be concluded that frequent, autonomous, as well as collaborative technology-supported learning usually leads to better study performance.

Based on the research results and the theories about CALL, we dare to assume that the future of CALL would rather be a blended CALL approach, where a teacher-student pattern interaction is the base, which would be supplemented by studying with the help of the gradually developing technologies, performed at any place and time, benefitting from the enormous potential of technology's flexibility.

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