

EFFECTIVE ONLINE LEARNING CONTENT DELIVERY

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Abstract:

Online learning and microlearning are now a well-established part of university education. In our practice, we use the Learning Management System (LMS) as well as the Microlearning Content Management System. We often ask ourselves what structure of tools to choose to ensure that learning objectives are effectively achieved.

In our work, we have received feedback from students, participants of the fully online course within five years. The monitored group consisted of 368 students in the selected courses. Through an anonymous online questionnaire, we were always given an opinion on preferred ways of working, benefits and problematic aspects of the content-providing applications as well as recommendations for their completion and recommendations changes.

The paper brings a summary of selected conclusions resulting from the quantitative as well as qualitative analysis of the knowledge gained in the period from the years 2014 to 2018. The results confirm the growing popularity, importance, and efficiency of the use of microlearning. At the same time, they point to the potential and hierarchy of teaching resources. Interactivity has a vital role to play here but depends on the content and context of the learning topic. An interesting finding is that there is still a relatively large proportion of users who print the content from the teaching portal and then study it in a classic paper form.

Keywords: online learning, microlearning, learning management system, microlearning content management system, learners' feedback

1. INTRODUCTION

We currently have a relatively wide range of online learning technologies. Network quality and reliability are increasing, and Internet penetration is growing fast. Delivering learning content to the end user becomes easier. From a technological point of view, we can point out positive changes.

What do the online teaching systems provide? There is a relatively wide range in the LMS. Evaluation portals register around 570 LMS (<https://www.capterra.com/learning-management-system-software/>).

There is also a relatively high variability in the work of pedagogy with respect to teaching content and instruction within the systems. There are a variety of learning strategies available, along with a variety of additional features. E.g., Scholarly offers more than 200 add-ons that can be easily used in the learning system. Many LM systems have an integrated virtual learning room, or it can be accessed as an external application (API). There are several solutions; comparative portals register about 20 widely used virtual classrooms (<https://www.g2.com/categories/virtual-classroom>).

From the perspective of a user, whether a teacher or a student, the overall concept of the learning room plays an important role. Dependent on how it is used and to what extent determines whether additional plug-ins are needed. Computer security systems, camera, and microphone access blocking also play a role. Less computer literate users are confronted with such problems quite often. They often confuse their technical problems with the functionality and effectiveness of the virtual room – by simply complaining the virtual room did not work.

Microlearning is a way of teaching and delivering content to learners in small, very specific bursts. The learners are in a micro environment in which they perceive they are in control of what and when they learn.

1.1. Practical aspects of using online learning

In our teaching practice, we have been using LMS Moodle linked to the virtual learning room WIZIQ for teaching human-oriented subjects for several years. Our Microlearning Content Management iLearn.sk complements learning concept. It is based on KnowledgeFox technology and works on servers of the same company. It allows the distribution of multimedia teaching content via smartphones and tablets and gives feedback on the student's work.

The important issue of the work with this technology infrastructure was searching for user feedback. As part of this paper, we have developed an analysis of selected aspects of online learning. Our target groups were students of the specific course, for five years, from 2014 to 2018.

Analysis of selected aspects of the teaching system

Online learning creates a specific situation. Tools used by the teacher shapes its structure; learning objects, communication with students, interaction with the content of teaching, verification of knowledge. An important aspect of functioning is the creation of an educational community able to use these tools effectively.

We assume that the appropriately chosen structure of the learning process respects the needs and preferred way of working of its participants. One of the questions we asked was the question of the preference of the form of teaching content and the interaction with the teacher in the chosen university course.

2. DATA COLLECTION

We surveyed students by online questionnaire. The questionnaire was distributed electronically by an anonymous server. Users identity was anonymous; we collected age and gender only Table 1 and Table 2 shows the gender and age structure of the groups.

Table 1 Gender

	2014		2015		2016		2017		2018	
Gender	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Man	11	20,4	20	26,3	8	10,8	12	22,2	8	16
Woman	43	79,6	56	73,7	66	89,2	42	77,8	42	84
Total	54		76		74		54		50	

Table 2 Age

	2014		2015		2016		2017		2018	
Age	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
>= 20	1	1,9	3	3,9	4	5,4	2	3,7	1	2,0
21 -24	49	90,7	73	96,1	66	89,2	48	88,9	46	92,0
25 - 39	3	5,6	0		4	5,4	3	5,6	2	4,0

30=<	1	1,9	0	0	1	1,9	1	2,0
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One set of questions was focused on determining the importance that individual respondents attribute to e-learning tools.

Table 3 E-learning tools preference

Preference	2014	2015	2016	2017	2018
Own pace of study	6,17	5,61	5,89	5,85	6,29
Virtual classroom recording	6,02	5,91	5,26	5,81	6,22
Announcement Information	5,89	5,83	5,70	5,96	6,04
Mobile Learning (tablets, smartphones)	5,17	5,14	5,22	5,81	5,82
Multimedia (video, animation)	4,81	5,18	4,91	5,52	5,55
Links to interesting resources	4,54	4,99	4,96	4,98	5,41
Online advising	4,57	4,96	5,41	5,28	5,39
Virtual classroom	4,78	5,03	5,22	5,70	5,16
Discussion board	5,26	4,86	4,89	4,63	4,90

The results are interesting in that they show in the averaged assessments, the highest rated aspects of e-learning are the own pace of study and the ability to track the lecture from the record. The operational information exchange system is also highly valued. The mobile learning system achieves a significant ranking. According to the other obtained data, connection with the user mobile application ilearn.sk was viewed positively. In the last places of the ranking were virtual class and discussion panel. The possible explanation for these results is as follows. Most of the students involved were the first to learn online. The discussion panel as a form of communication was a new tool for them and required some, techniques and skill previously not developed.. In the virtual classroom, ratings were influenced by the degree of computer literacy and how unexpected situations were handled. The variability in evaluating the importance of this tool is also significantly higher than in other cases.

3. DELIVERY MODES WITH ONLINE CONTENT

We asked the students how they use online learning content particularly with respect to onscreen study and printed material study. In this instance the question presented via likert Scale stated: "I study materials directly from my computer screen." One (1) , in the Likert / Scale ids "does not apply for me" while 5 on the other end of the scale is "absolutely true for me." The data depicted below compares 2014 to 2018 student responses. Figures 1 and 2 reflect the student responses for onscreen study for 2014 and 2018. The figures show a shift from a non-preference or applicability of onscreen learning to greater applicability in 2018.

Figure 1 2014

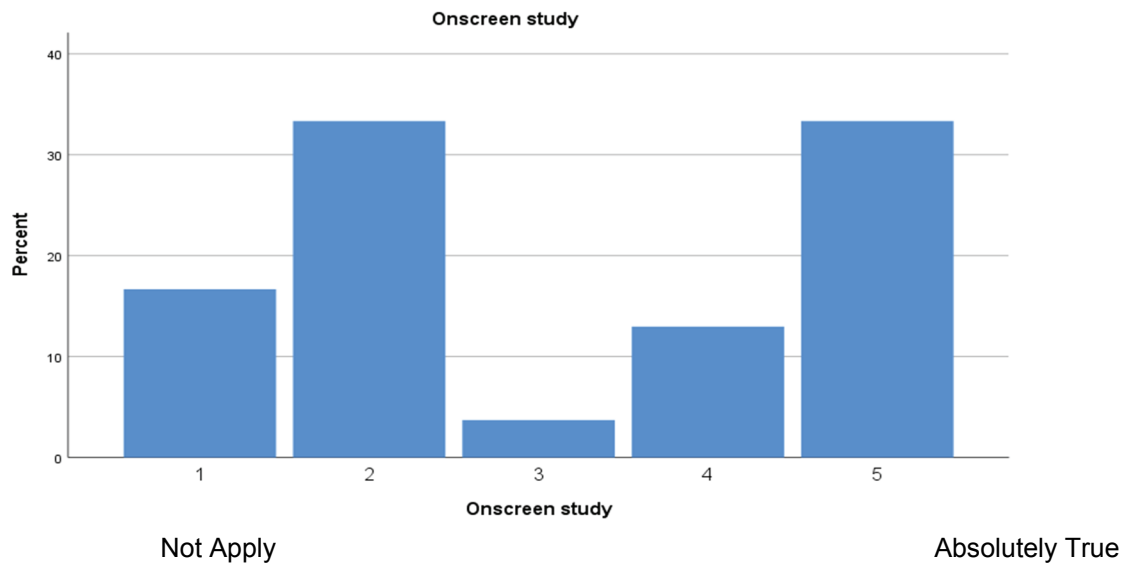
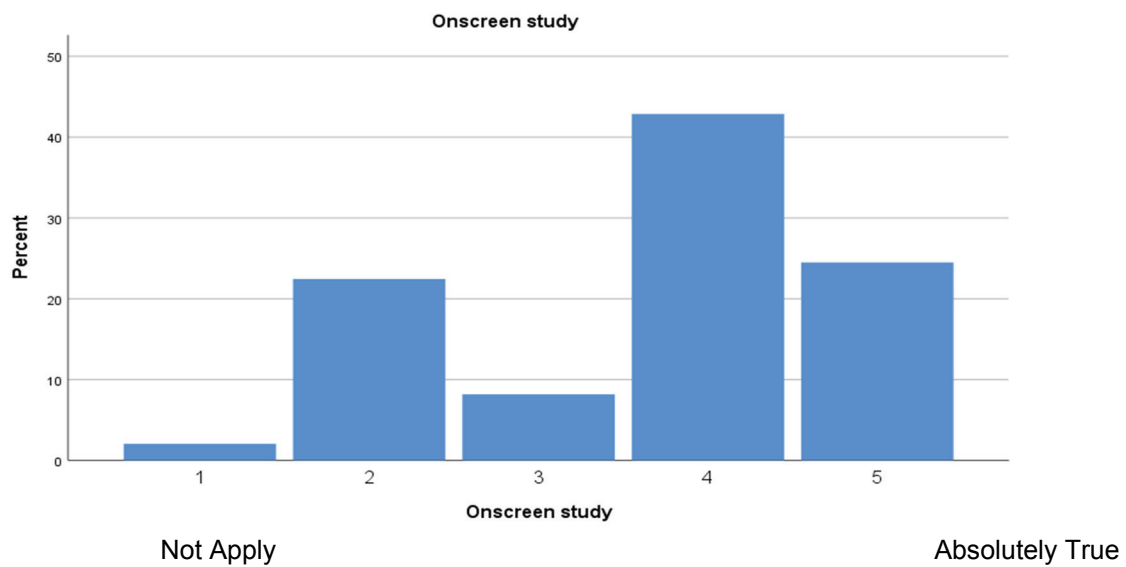


Figure 2 2018



Figures 3 and 4 reflect the student responses for the question “I would rather print the materials.” In the 2014 and 2018 comparison—there appears to be little change. Student preferences are split. This indicates there are students that prefer paper while others prefer onscreen learning. This may be correlated with age and familiarity with computer technology for other things such as news, entertainment, and gaming.

Figure 3 2014

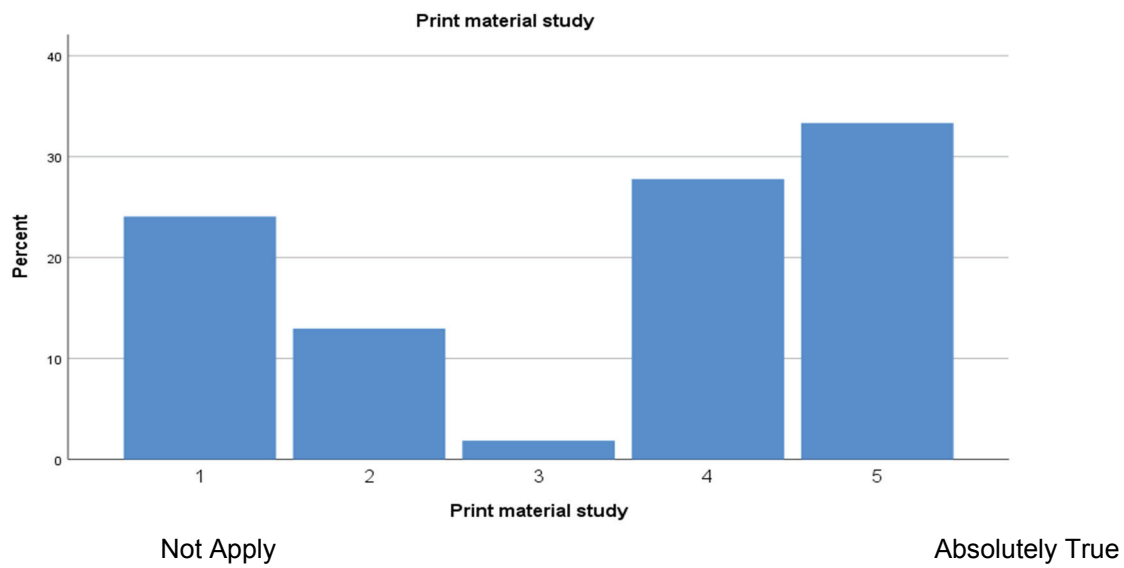


Figure 4 2018

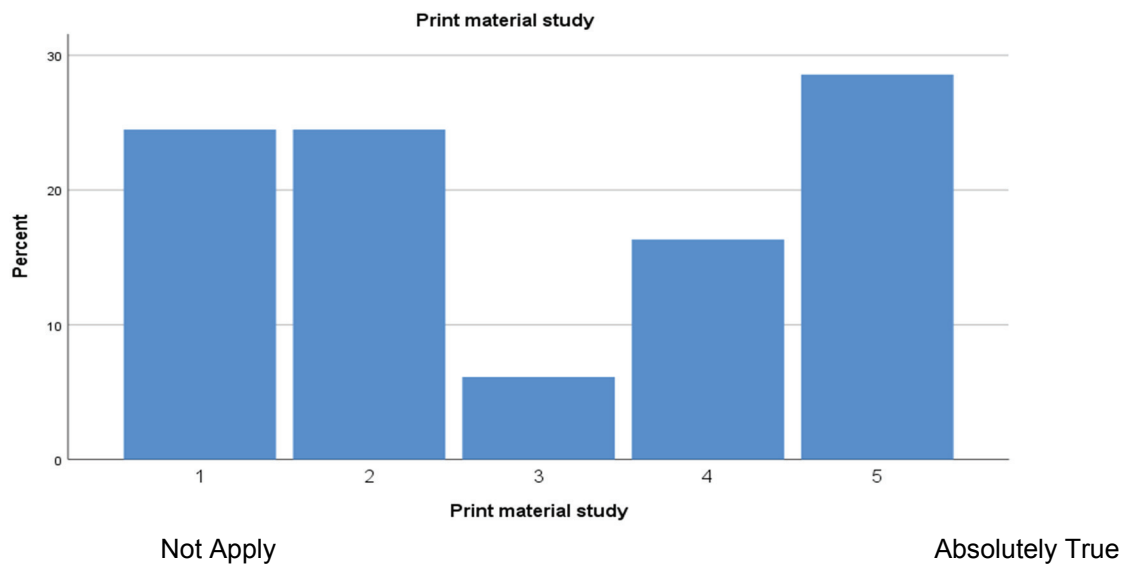
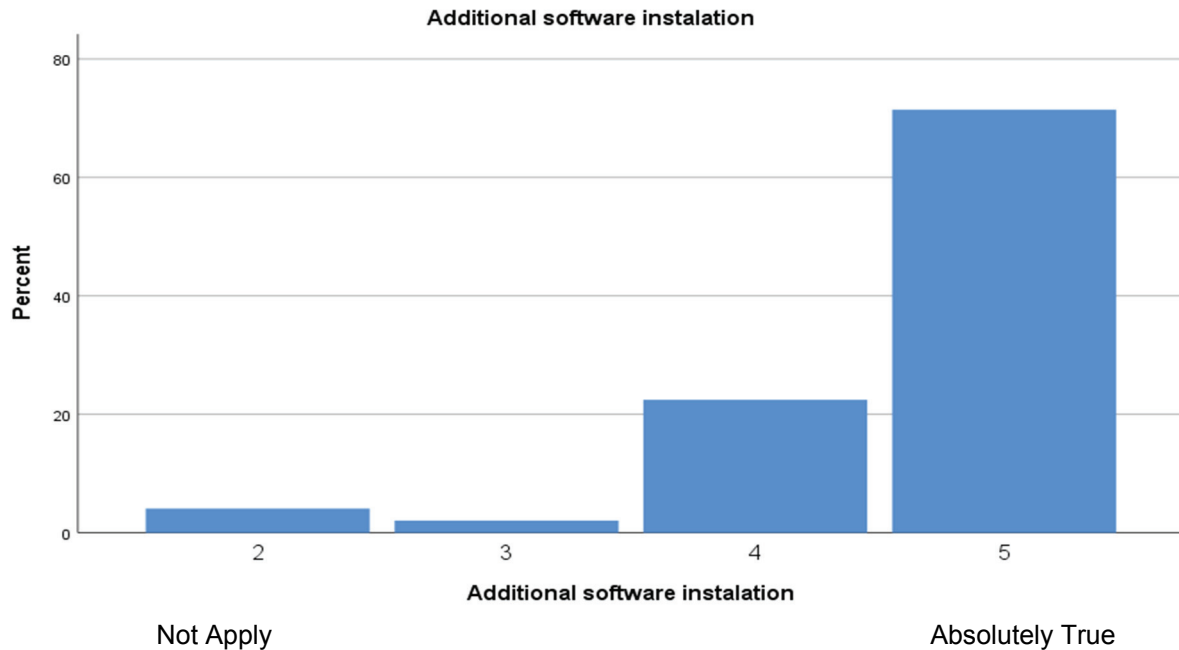


Figure 5 addresses student response with respect to the topic of additional software installation. In particular, Figure 5 shows the student response to “I prefer materials to which I do not have to install most software.”

The results over the 5 year research period show the same trend. Simply put, students prefer ready to use learning systems without the burden of having to install additional software and/or plug-ins. Usability and plug and play seem to dominate student attitude and incentive to react favorably to such technology facilitated learning.

Figure 5 Additional software installation



4. WORKING WITH MICROLEARNING APP ilearn.sk

Microlearning is not a new phenomenon. The concept was known years ago but the quick development and use of mobile devices, bring a lot of new features to the mobility of learning.

Microlearning is learning through little lexical (meaning-bearing) elements joined into meaningful themes. The content consists of pictures, sound, video, and their combination. We can speak about three microlearning levels (Hug, 2005):

Level 1: One-picture stories and elements of fabula (single screens)

Level 2: Multiple-picture stories and arranged elements of fabula (sequences of screens)

Level 3: Elaborated forms of narration and storytelling (complex uses of sets of screens)

The iLearn.sk app is able to deliver the learning content across all three levels.

5. iLearn.sk MAIN FEATURES

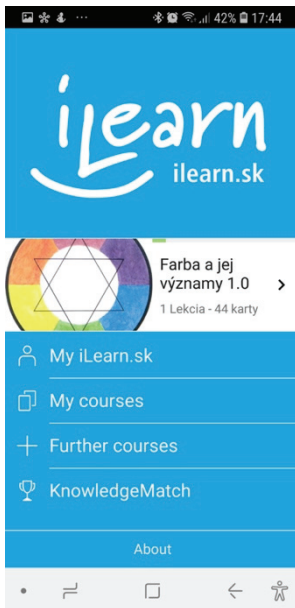
iLearn.sk asks the student short questions taken from the learning content. How often is up to the student. Each question can be either accepted or canceled and answered later on.

The student will receive immediate feedback about whether or not his answer was correct. If it's not, you will be shown the correct answer.

iLearn.sk repeats knowledge cards until the student has answered them correctly several times. The number of repetitions is specified by the course instructor or trainer for each lesson. iLearn.sk automatically sends learning reminders. A student can specify the timeframe during which he wants to be reminded yourself.

The unique feature of the iLearn.sk is KnowledgeMatch – competition between students. Further information about iLearn.sk can be found on the website www.ilearn.sk

Picture 1 iLearn.sk app



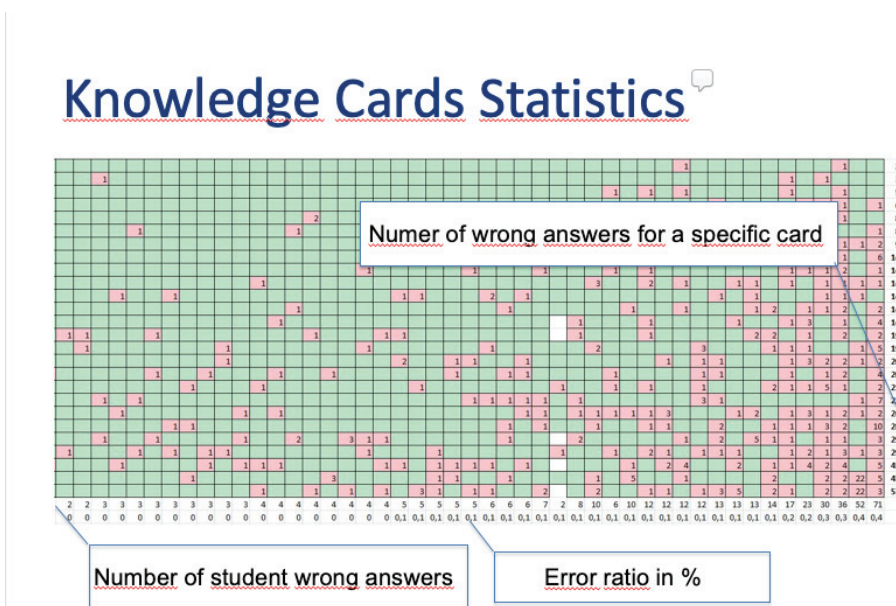
5.1 Learning Strategy

iLearn incorporates a Rapid Learning Strategy. Rapid learning strategy means that a card is not repeated if it is answered correctly the first time around. It also utilizes a 2, 3, 5 times recall strategy where a card is not repeated if it is answered correctly the first time around. This is done via a “slide show strategy” utilizing knowledge cards as the visual presented. Additionally a test strategy uses the same slide show knowledge card visual presentation.

5.2. Measuring Student Success

The students work with the learning content is recorded and evaluated by the server. The teacher or administrator can see the results for all group of the students or export t from the server in various formats.

Picture 2 Example of students answers evaluation



5.3 Learners feedback

We asked students from all groups on their opinion about the experience from learning with ilearn.sk. It was part of the questionnaire described above as an open question.

Positive

"An interesting and innovative way of verifying knowledge."

"The good thing also is that we can find answers. Thus we were forced to study materials that we would be in other circumstances can be so lazy."

"A significant positive is enough time to complete all the questions."

"Immediate feedback."

"Time flexibility test (there are no errors of stress or fatigue; someone is the greatest power in the morning, someone in the evening, etc.)".

"Test forced us to think about dissolving issues and deepen their knowledge."

"Possibility to set your own pace and do the test at times when I have to space and time."

Negative

"I do not see any."

"Finding a negative aspect is difficult."

"Initial technical problems."

Supportive

"Thorough knowledge acquisition."

"Its helped me confirm to the best of my knowledge and memorize them thoroughly."

"The benefit is certainly a new method of learning. It is more effective than mass memorization."

"I could quickly and easily check my knowledge that I have acquired reading literature."

"Easy ways to subtly coerce people to learn."

"Some questions were difficult, forced to think, but this test helps to learn that at least 99%"

"I think it's a well-devised, clear, interesting."

"I confirm knowledge of the subject, and the better I remembered curriculum."

"The benefit for me was to deepen the knowledge about the topic more entertaining form than usual.."

Key benefits

Better use of classroom time: not for knowledge acquisition and repetition .

Good acceptance among students: saves time, motivates to learn.

Create and update learning content easily.

Get clear visibility of learning activity and knowledge build-up of your students.

Identify knowledge gaps that need to be addressed.

6. CONCLUSIONS

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