Downtime learning – a way to increase the effectiveness of the learning process?

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Abstract

Contemporary mobile technologies and changing behavior of human society, increasingly dependent on the Internet connection, open the question whether it is not necessary to offer new teaching methods. Smartphones or tablets enable us to support learning process outside the school in the student´s downtime. The research study gives us basic elements and orientation of the downtime learning.

„Downtime learning" - ein Weg, um die Effektivität des Lernprozesses zu erhöhen?

Zusammenfassung

Im Zusammenhang von mobilen Technologien und den Verhaltensänderungen der modernen Gesellschaft, die zunehmend abhängig vom Internet ist, steigt der Bedarf an neuen Lehrmethoden. Smartphones oder Tablets ermöglichen es, Lernprozesse außerhalb der Schule in der sogenannten „Downtime" des Schülers zu unterstützen. Diese Studie stellt Grundelemente des „Downtime Learning" vor.

Keywords:	Schlüsselwörter:
Downtime learning	Downtime learning
Mobile technologies	Mobile Technologien
Smartphone	Smartphone
Learning process	Lernprozess

1   Introduction

Even in times of strong information expansion it is still the aim of education to equip pupils and students with such skills enabling them full-fledged personal and professional life. Contemporary mobile technologies and changing behavior of human society, increasingly dependent on the Internet connection, open the question whether it is not necessary to offer new teaching methods. For example, support for teaching/learning process through mobile devices. Such process may not take place only in school, but whenever a student has a downtime. The question is if today's students use these facilities already themselves in this manner, i.e. in the so called "Downtime learning"? Our research survey deals with the use of digital (mobile) technology in teaching/learning vocational subjects. It focuses on both teachers and students. From the ongoing collection of data it results that the majority of respondents own a smartphone, which is used for learning but less for preparation of lesson.

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2   Brain Relaxation

Research focused on sleep, meditation or other relaxation techniques show how the break during the mental work increases its productivity. It increases then one's attention, it reinforces his memory and it supports his creativity. In this regard, it is necessary to insert so-called "Downtime". These can be filled in any other activity that engages different brain centers, in order to regenerate those primarily loaded. In the mid-nineties, the team at Washington University in St. Louis (Raichle, 1995) has shown that the human brain is a large energy consumer. In the rest it will burn about 20% of all the energy that the body produces. If the brain is disturbed by reading books or calculating math problems then his claims are even as much as 10% higher. What does that mean? Precisely because the brain is such a big consumer of energy it needs to carry out sanitary breaks for the regeneration of the body and especially the brain itself.
One of these regeneration activities may be done in downtime process, which will employ different brain centers than previous work. For example, the memorizing can be followed by a short math quiz or Sudoku, or vice versa. Moreover, we can apply these finding in the downtime learning.

3   Trends in Education

Trends in education in the past few years suggest that part of the training is done using the Internet. One could almost say, "Who is willing to use the Internet for education that conquers the world." This applies to both institutions that educate and individuals who are educated. Because the Internet now includes / offers tools that support learning, it is possible to realize the learning process outside the classroom. At the same time around these technologies, not only in the Czech Republic, it gradually forms a community of users of the services such as Google EDU Group CZ, Club of modern teachers at Microsoft, community iSEN (iDREAM) using Apple products, Moodle users, and other groups that share information how to work in these SW educational environments.
The situation in the world has already moved partly in another direction, and it is now dominated by MOOC courses (Massive Open Online Course). This phenomenon is associated with many renowned universities across the world. As the name implies everything is done online and student can access to materials, video lectures, discussions and conferences from anywhere and at almost any time. A common feature of MOOC courses is that the course is free. Some universities allow obtaining their graduation credits, which can then be used for completion of university studies. Furthermore MOOC courses motivate the student to study, therefore the MOOC courses are applicate generally in tertiary education. MOOC students have to participate in the discussions with the instructors and with each other. MOOC courses are actually built on the theory of connectivism (Downes, 2014).
Returning now to the downtime learning, the term itself represents a controversy. Consider a general high school student. If he will be present 8 hours of formal education in school will then he has enough "power" and "desire" to study in his spare time? But we speak on downtime not on spare time.

4   Downtime Learning

In terms of chapter 2 the downtime learning must be therefore implemented in small doses. The ambience is not restricted to particular place or time. Educated individual is thus drawn into the process of learning, for example, while waiting for a friend, at the bus stop, or if he orders a coffee. These assumptions summarized D. Groom in his paper "The Downtime Learner theory" (Groom, 2011).
Downtime learning is therefore another modern form of open learning. Downtime learning takes place somewhere between home and school / work. It is more satisfying and effective than trying to learn the same thing at school / work or at home, where one have a lot of other problems to solve. In addition downtime learning requires almost no preparation.
We can learn anywhere but we need someone to guide us in our education. Downtime learning theory focuses on sustainable and stable learning concentrated on learners, regardless of where they work or study. It can be applicable for lifelong learning, which is required by today's educational sciences. One of the crucial questions is if the teachers are prepared for such a learning method.

5   Research Process and Results

5.1   Research

The aim of this research is to contribute to the monitoring of the current status and role of digital technologies in Czech teacher's preparation for teaching and for their own self-education.
In order to achieve the research objectives we defined research questions (marked as Q1) and hypothesis (marked as H1). In this paper we present only one of the set of questions and hypothesis.

Q1: What are the means used (what they do) teachers during downtime?

H1: Teachers with shorter teaching experience used digital technology during downtime.

The length of teaching experience	Without teaching experience	1–15 years	16 and more years	Σ
Uses mobile digital devices during downtime	33	48	11	92
Does not use mobile digital devices during downtime	13	14	3	30
Σ	46	62	14	122

Table 1: The numbers of respondents, according to the answer of whether they use mobile digital technology within their own downtime

The questionnaire was developed according to the methodology of questionnaires (Chráska, 2007), (Gavora, 2008). As introduction to questionnaire the letter to the respondents (teachers/university students) explains the aim of research and gives the assurance of anonymity of obtained responses. Prior the research questions to test hypotheses we ask the questions to determine demographic data about the respondents. The time required to complete the questionnaire was approximately 10 minutes. Participation of respondents was anonymous, voluntary and without any reward. For further generalization, it is necessary to take into account the fact that the respondents are a group of students/teachers of vocational subjects or practical training that has an interest and willingness to help the researchers.
The questionnaire was completed by 122 respondents, 41 men and 81 women. The age distribution of respondents is in Figure 1.

5.2   Hypothesis Evaluation and Discussion

The data obtained from the questionnaire was transferred to a table (Table 1). For Table 1 it was calculated chi-square test (χ-square test) that was used for evaluation of hypothesis (Chráska, 2007) according to established methodology and relationships prescribed for it. The significance level was set at $p \leq 0.01$ and the number of degrees of freedom (f = 2) to be $\chi^2_{0.01}(2) = 9.210$. As the calculated value ($\chi^2_{H1} = 0.545$) is significantly lower than the critical value, we do not confirm the H1 hypothesis.
From the obtained data, we can say that the hypothesis was not confirmed. So, it was not established that there is a relationship between the length of teaching experience and the use of digital technologies during downtime.
It is evident from the respondents' answers that they use digital technologies during their downtime regardless if they are teacher or students. On closer examination of answers we found that most of respondent are working or preparing to work/study during their downtime. Furthermore, we found that the greatest number of 14 respondents listened to music now. 13 respondents study materials for further professional development or educational materials to school always in paper form.
We therefore believe that most of respondents use music as a relaxation technique. We therefore propose as an appropriate means for downtime learning method the audio recordings. It may be a book or audio recordings of lectures from school. In addition, this brings also an advantage of the increased speed of recitation, which may shorten and intensify the learning of student.

At our institute we create in 2014 learning applications for mobile devices. It focuses on teaching manual woodworking, designed for apprenticeship cabinetmaker. It contains the complete textbook, a large number of tools in graphic design, visual and also didactically correct implementation of individual operations during manual machining using a recorded video clips. It is designed to educate future teachers, teachers of practical training and to students for homework preparation. It is therefore a specific application that is targeted to a specific group of students, and above that it has a specific content. The downtime learning needs to follow simple, clear and short form of communication. This implies from the fact that students learn during short downtime. This application is free and is available on Android, iOS and Windows 8th platform (Sládek, 2015).

6   Conclusion

The current educational system in many cases abandons simple memorization and supports an active student exploration; this is exactly what mobile technology allows whether alone or in conjunction with downtime learning. In the paper we present some results of the research study presenting basic elements and orientation of the downtime learning. From our investigations we can further say that mobile technology are currently implemented in the school, but the level of integration is not so pronounced as if they imagined their parents or the children/youngster themselves. However, the downtime learning materials needs to be specially prepared for this purpose.

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