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STUDENTS' INDEPENDENT LEARNING IN HIGHER EDUCATION

The article researches the concept of personal learning environment, its essence, functions and application in modern higher education. The theoretical background of personal learning environment is based on the concepts of self-regulated learning, connectivism and constructivism. The paper discusses current opposition between the concept of personal learning environment and learning management systems (LMSs). The review is tuned to current tasks within European project IRNet – "International Research Network for study and development of new tools and methods for advanced

pedagogical science in the field of ICT instruments, e-learning and intercultural competences". Professors should guide their students in their self-motivated learning path.

Key words: *personal learning environment, higher education, ICT tools, teachers and students' ICT competences.*

Introduction

With the current trends in higher education, when more and more workload shifts to organizing students' independent work, the idea of personalized learning gains momentum. Current generation of young learners, born in the 1980s and the beginning of the 1990s, the so-called "net generation" gain ICT-competences quite easily (Valtonen et al., 2012). This net generation, or the so-called "generation Y" grew up with the progress of digital technology and these learners got used to enormous fields of information, besides, they are getting to newer and newer tools for obtaining knowledge. This represents a huge challenge for the educational systems that are on the way of changing dramatically. At the same time, these learners face enormous challenge in their future profession, as they will need to present even newer ICT competences in the job market on graduation. These new learners force teachers to switch to digital learning environment too. Specifically, this new generation of motivated learners is struggling in this vast field of tools for learning.

Current interest in self-motivated learning has given birth to quite a number of terms that signify the unique collection of certain web-based instruments helping the learners to organize their knowledge activities, varying from PLE (personal learning environment), PLN (personalized learning network), VLN (virtual learning environment), PLL (personal learning landscape) to ILE (informal learning environment). Of all these the term PLE has probably been chosen by the majority as the most appropriate.

PLE is a relatively new concept, the history of the terms PLN or PLE, obviously quite similar in meaning, starts as far back as 1998/99 (PLE diagrams).

Related terms such as web 2.0 have led to still newer potential terms e-learning 2.0, pedagogy 2.0, student 2.0, faculty 2.0, and classroom 2.0,

with the suffix 2.0 characterizing themes such as openness, leaving a little room for learners to manage and maintain a learning personalization, collaboration, social networking, social presence, space that facilitates their own learning activities as well as user-generated content, the people's Web, and collective wisdom (Dabbagh and Kitsantas, 2012).

Statement of the problem

The goal of this paper is to research into the essence of personal learning environment, aided by electronic means, to outline briefly its structure, approaches and practical applications for teaching practice.

All the above mentioned problems are the focus of research within the European research project IRNet –"International Research Network for study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences", where we are honoured to participate.

The research was conducted by the methods of the literature review analysis, which included an overview of recent publications, including web-based ones.

Results

PLEs are typically described as a collection of different ICT tools and software, usually social software, to foster self-regulated and collaborative learning (Valtonen et al, 2012). Mott defines PLEs as student-created matrices of resources that they themselves select and organize, thus he stresses students' self-regulating role (Mott, 2010).

Stephen Downes describes a PLE as: "...one node in a web of content, connected to other nodes and content creation services used by other students. It becomes, not an institutional or corporate application, but a personal learning center, where content is reused and remixed according to the student's own needs and interests. It becomes, indeed, not a single application, but a collection of interoperating applications – an environment rather than a system" (Downes, 2015). PLEs can be considered a technology and a pedagogical approach which is developed by the learner, but it also can be considered a learning approach (Dabbagh et al., 2012).

PLE is a quite modern and ambitious idea but there doesn't exist a single picture presenting their functions and purposes.

Considering PLE more of a pedagogical approach on the base of questionnaire for university students of different courses (Valtonen et al, 2012) have drafted the list of functions and purposes of PLEs as they are seen by the students:

– mirroring a conventional learning environment;
– an environment for reflection;
– an environment to showcase skills;
– an environment for collaboration and networking.

More on the functions was stressed here (Rahimi et al, 2014b): PLEs serve for creative and collective contribution, knowledge (co-producing, communication, knowledge management and organizing, self-expressing, creating and managing personal pages, analysing and developing new concepts and ideas, and sharing and exchanging documents).

The construction of PLEs grounds on a few scientific trends: personalized or self-regulated learning, connectivism, collaborative learning and constructivism.

The idea of PLEs has strong similarities and most likely derives from the idea of personalized learning (Zimmerman, 1990) and a later concept of connectivism supported by two main publications "Connectivism: a Learning Theory for the Digital Age" (Siemens, 2004) and "An Introduction to Connective Knowledge" (Downes, 2007).

Personalization is a trending topic in educational technology. The definition is so broad as to become a catch phrase to describe many new tools and transformation initiatives (Dexler, 2014).

Self-regulated learning theories of academic achievement are distinctive from other accounts of learning and instruction by their emphasis *a)* on how students select, organize, or create advantageous learning environments for themselves and *b)* on how they plan and control the form and amount of their own instruction. Still, Zimmerman stresses, that students who lack self-management skills will seek advice from their educator (Zimmerman, 1990).

G. Siemens quite sensibly states that former educational theories, mainly behaviorism, cognitivism, and constructivism were overshadowed by a new one – the connectivist theory, due to profound changes brought in by new technologies.

Principles of connectivism are well known:
– Learning and knowledge rests in diversity of opinions.
– Learning is a process of connecting specialized nodes or information sources.
– Learning may reside in non-human appliances.

– Capacity to know more is more critical than what is currently known.

– Nurturing and maintaining connections is needed to facilitate continual learning.

– Ability to see connections between fields, ideas, and concepts is a core skill.

– Currency (accurate, up-to-date knowledge) is the Intent of all connectivist learning activities.

– Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

Connectivism is the thesis that knowledge is distributed across a network of connections, and therefore that learning consists of the ability to contrast and traverse those networks. …there is no real concept of transferring knowledge, making knowledge or building knowledge. Rather, the activities we undertake when we conduct practices in order to learn are like growing and developing ourselves and our society in certain (connected) ways (Downes, 2012).

One example of connected knowledge are social networks like Twitter, Facebook, Pinterest and LinkedIn which can be used for self-motivated learning, and this is proved by the fact that they are currently in the top 20 tools on Jane Hart's list of top 100 tools for learning, only followed by Moodle as the first LMS on that list.

Modern Ukrainian students widely use social networks to communicate with their groupmates in their free time. Nevertheless, the educational potential of social netwrosk is still to be exploited fully. Thus, according to the results of a poll, held within the IRNt project, it was found that only 15,15 % of students use social networks to stay in touch with their professors in free time (*Table 1*). The most popular means of communication are private meetings (31,31 %), communication via e-mail (39,63 %) and telephone (22,56 %).

Social networks proved to be even less used for delivering their papers to the professor (*Figure 1*). Only 9,11 % of students consider social networks an effective mode of communication for these goals. Compared to this, 30,89 % of the respondents use email, 28,61 % – traditional paper forms,

Table 1

**The most widely used e-tools for communication
between professors and students in free time**

Mode of response	%
Personally	31,31
Via email	29,63
Via telephone	22,56
Via social networks	15,15
Via Moodle platform (or similar)	1,35
Total	100,00

and much less students prefer oral response during classes – 12,66 %. At the same time, it is worth mentioning, that portable (external) means of information storage (for instance Flash-sticks) are considered effective by 10,38 % of the students, distance learning platforms (for example, Moodle or similar – 3,29 % and cloud services were considered effective by only 5,06 % of the respondents.
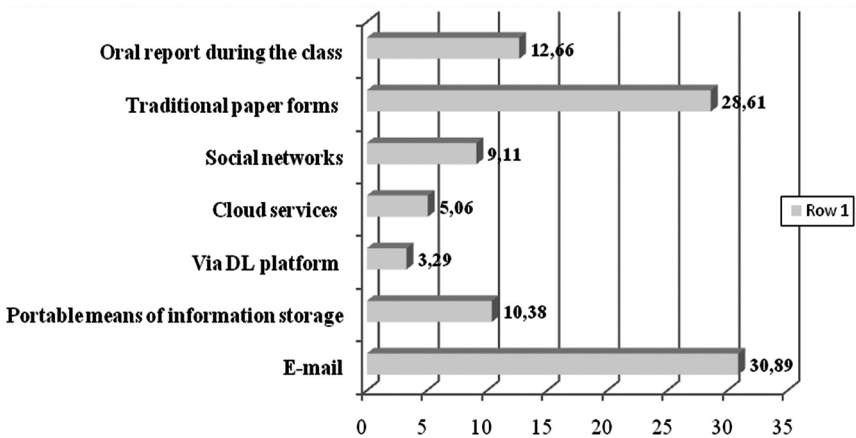

Fig. 1. The responses to the question "Which means of sending finished test papers to the professor do you consider the most effective?" (in %)

At the same time, it is worth mentioning, that in practice the most widely used means of sending finished test papers to the professor are paper forms (37,5 %) and oral presentations during classes (17,22 %). Though, electronic means gain quite a lot of popularity, they are very widely used in educational process. Namely, we mean using email – 22,22 % of the respondents, portable (external) means of information storage (for example, flash-sticks). 5,56 % of respondents stress their use of social networks in learning (see *Table 2*).

Table 2

The most widely used means of sending finished test papers to professors (in %)

Sent via email	22,22
Portable portable (external) means of information storage (for example, flash-sticks)	11,67
Via distance learning platform, based on MOODLE or other similar	2,78
Cloud services	3,06
Social networks	5,56
Traditional paper forms (printing, copying)	37,50
Oral presentation during classes	17,22
Total	100,00

The comparison of the most effective and the most widely used means of handing in finished test papers to the professor are presented in *Figure 2*.

Aside from self-regulated learning and connectivism, the ideals and assumptions concerning PLEs align with the theory of collaborative learning. Collaborative learning refers to interactions between people that are expected to trigger mechanisms for learning (Dillenbourg, 1999). This interaction can be viewed as the one, taking place in social media, as they facilitate the creation of PLEs that help learners aggregate and share the results of learning achievements, participate in collective knowledge generation, and manage their own meaning making (Dabbagh and Kitsantas, 2012).
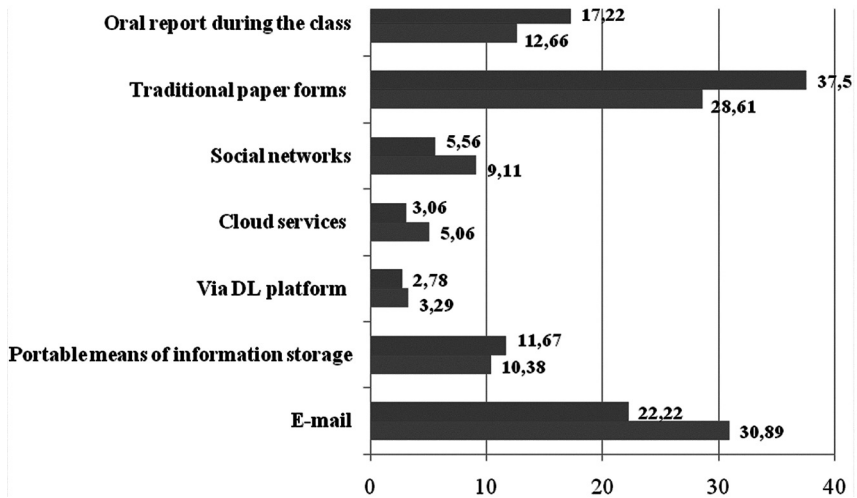
Fig. 2. The comparison of the most effective and the most widely used means of handing in finished test papers to the professor (in %)

It should be noted that collaborative learning (working together for the same task) is not the same as cooperative learning which is working for different tasks but depending upon the success of the other group.

Constructivism serves as yet another theoretical framework for student construction of personal learning environments. Students are expected to access, navigate, disseminate, and synthesize large quantities of information for the purpose of constructing knowledge (Dexler, 2014).

The results of the poll proved that modern Ukrainian universities prefer teamwork (group work) – 54,89 %. At the same time, personalized (individualized) mode of study was chosen as desired but a quarter of respondents (25,54 %); the collective was chosen by 14,67 %, the team network leaning (distant work) – was chosen by 4,89 % respondents (*Table 3*).

In the situation when personalization of education is gaining more momentum, the ongoing scientific debate on the clash between LMSs and PLEs gets more acute. Apparently, an LMS will suit a constructivist approach to learning whereby content is organized, learning is structured, sequential, placed within context, managed etc. Whereas a PLE/PLN tool structure reproduces the connectivist approach

Table 3

Preferred mode of learning

The answer	Number	%
Team (group work), traditional	101	54,89
Personalized (individualized) mode	47	25,54
Collective	27	14,67
Team network study (distance)	9	4,89
Total	184	100,00

to knowledge as "a pattern of relatedness" (Siemens) is "embedded in a mesh of connections" (Downes).

It is quite bravely suggested that PLEs are the next step in the development of educational technology, a replacement for learning management systems (LMS), providing tools and learning practices to meet the needs of the knowledge society (Valtonen et al., 2012).

PLEs seem to be more effective in terms of personalization and learner control over the process, which institutionalized LMSs most often lack (Dabbagh and Kitsantas, 2012), though it should be mentioned that with the modern concept of adaptive LMSs there is some technical possibility to adjust the learning system to students' personal needs (Kostolányová, 2012), where the students will be prompted to set their own learning goals, manage content and their learning process itself (Morze and Kocharyan, 2014).

In quite an insightful paper Mott (2010) presents a comparison of strengths and weaknesses for LMSs versus PLEs. Among other differences, it is stressed that LMSs are teacher, rather than student-centric, while PLEs are student-centric (each student selects and uses the tools that make sense for their particular needs and circumstances).

Noskova stresses, that the switch from LMSs to non-linear, flexible personalized learning environments could improve the quality of education, but the teacher will have to gain new professional competences, to be able to communicate in the new field. For instance, the new teacher's skills could include communicating in groups and organizing group work. in general, the organization of this web-based

educational communication is a much larger task than just delivering to students leaning content (Noskova and Pavlova, 2011).

Sadly, a recent survey into ICT use in European schools revealed that teachers mostly use ICT in classroom for preparing classes, while the use of ICT for learning is lagging far behind (Sekret and Kommers). Among other barriers to more profound use of ICTs in schools there were revealed the following: there is a lack of teacher training courses, besides, there is a lack of integration between ICT use in teaching and learning.

Evidently, ICT competences, or digital literacy is necessary to become an effective networked learner. Consequently, the teacher's digital literacy should reach far beyond the student's one. Digital literacy extends beyond a basic comfort with new technologies (Alkali and Amachi-Hamburger, 2004), there can be different approaches to its structure. For instance, Dexler identifies five major digital skills:

– photo-visual (the ability to make sense of graphical representations); reproduction (create new artefacts from existing content);
– branching (knowledge construction from hypertext);
– information (evaluating content);
– socio-emotional (interacting effectively with others online) (Dexler, 2014).

Even more experience and skills are needed for what can be an integration of both learning approaches – the PLE and the LMS one. Mott stresses that knowledge-dissemination technologies (LMSs) and community-building tools (PLEs) can be integrated for better performance within the learning process into an Open Learning Network (OLN), developed and deployed by the Brigham Young University. The OLN combines existing institutional applications, web-based tools, applications, content stores, and facilitating "connective tissue" technologies that allow them all to function together seamlessly (Mott, 2010).

Quite obviously, the prospects of PLEs, and more recently, of integrated learning environments are abound with learning opportunities, but it leaves many issues to be addressed.

Conclusions

With the current trends of personalization of education, complicated by current technological progress and induced by the pressuring need to improve the quality of education the professor's role is no longer limited to delivering course content. It extends as far as guiding the student and facilitating him in his self-driven learning advance.

Students' self-propelled learning should be guided by the teachers, not otherwise, thus professors should be getting specific updates on newer, more efficient tools to organize their students' PLEs, and on a regular basis.

It might seem quite evident that the core tools for independent learning are similar for the students of different courses, while later they can get more specified. This leads to a growing need to model the students' starting PLEs, and this should become a continuous process due to ongoing technological developments in ICTs. With the students' progress in their study, the models will be adjusted according to their course and individual needs. It still remains to be researched how this self-initiated learning should be evaluated, and if it should, what the interface of this evaluation can be.

Acknowledgments

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