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VIRTUAL CLASSROOM IN DIGITAL AGE: CONCEPT, PRODUCT AND APPLICABILITY

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Abstract. The paper is a descriptive ascertaining study that comes with the analysis of the phenomenon of virtual classrooms' using at different educational levels and / or in different educational situations in digital age, characterized by the migration of the implementation of certain ICT instruments, which have already become traditional to the so-called online learning platforms of various types and configurations. The research is carried out on several dimensions, in particular, conceptual, but also application-functional, reviewing several platforms dedicated to virtual learning. The comparative analysis of the set of tools offered by various virtual classroom platforms comes with a description of its special operating characteristics which depends on the typology of teaching activities to be implemented in online environment during direct and indirect hours of contact with students enrolled at a virtual course. Although, in this article, the model of using virtual platforms for learning management system will be focused on professional courses, correlated with computer science in the field of IT engineering training and / or others related to it, the general methodology for implementing virtual classes will be presented here according to the age, the curricular area of the taught-learned-evaluated disciplines and level of studies of potential beneficiaries. The author's personal experience is presented while practicing the use of virtual classes in the didactic approach of certain university disciplines. The author makes a comparison of her experience with some local and international experiences while transferring teaching-learning activities in the virtual environment using tools of the reviewed applications.

Keywords: *e-learning, IT product, learning, virtual environment, virtual platform, Web-based.*

Rezumat. Lucrarea prezintă un studiu descriptiv constatativ care vine cu analiza fenomenului utilizării claselor virtuale la diverse nivele și / sau în diverse situații educaționale în epoca digitală, caracterizată de migrarea punerii în aplicare ale anumitor instrumente TIC, devenite deja tradiționale, către așa-zisele platforme de învățare on-line de diverse tipuri și configurații. Cercetarea este efectuată pe mai multe dimensiuni, în particular, conceptuală, dar și aplicativ-funcțională, trecând în revistă mai multe platforme dedicate învățării virtuale. Analiza comparativă a setului de instrumente oferite de diverse platforme de clasă virtuală vine cu o descriere a caracteristicilor sale de operare particulare, în funcție de tipologia

activităților de predare care urmează să fie implementate în mediul online, dar și în orele de contact direct și indirect cu contingentul elevilor înscriși la un curs virtual. Deși modelul de utilizare a platformelor virtuale pentru învățarea gestionării conținutului este axat pe cursuri de profesionalizare, corelate cu informatică în domeniul pregătirii în domeniul ingineriei IT și legate de acesta, metodologia de implementare a claselor virtuale va fi prezentată conform până la vârstă, aria curriculară a disciplinelor predate-învățate-evaluate și nivelul studiilor potențialilor beneficiari.

Cuvinte cheie: *e-learning, produs IT, învățare, mediu virtual, platformă virtuală, bazată pe Web.*

Introduction

In digital age, education is in the center of changes that are meant to modify the world we live radically, affecting the fields of science, technology, engineering, economy and art [1, 2]. At least to this end are interested all parties involved in training the young generation at different levels: parents, teachers, psychologists, professors, researchers, representatives of the academic environment. Everybody has some connections with the Education Sciences and / or are preparing future specialists for various social-economic fields and / or are developing new methodologies and the new teaching-learning-assessment environments perfectly adapted to the individual training needs and circumstances of the learners.

"Virtual classrooms" type of products: notional circulation and descriptive analysis

Over the past few years, researchers are talking about the imperative of the flexibility of the educational system/process in the digital age. They consider it should be done according to prerequisites, objectives and educational aims to be included/achieved in the course of studying programs / didactic content, etc. The ability of an educational system/process to be flexible is provided by a set of components, which have been studied more or less by some researchers. For example, Herma Jonker & others (2020) refer to the topic of developing a flexible curriculum based on a blended curriculum [3]. Their version of the flexible curriculum is one adjusted to the level and capabilities of the learners. These researchers see the implementation of their idea through the combination of teaching-learning-assessment in a direct contact mode with distance learning. According to Ståle Angen (2008), flexibility is a compulsory component of any debate related to university education and to "alternative" forms of education [4].

We consider that *a flexible education system should be and can be modeled directly by using the digital tools for all types of didactical activities and / or situations through virtual classes.* Today there are some elaborate platforms capable to host such a way of learning in virtual classrooms. Referring to some of them, we can find short descriptions, explanations regarding the content of ideas that the developers have been trying to implement in their project. Although theoretical and methodological approaches related to the definition of the virtual classroom concept, the comparative and / or descriptive analysis of the functionalities with which the product is equipped and / or their opportunities for use are almost non-existent. The developers of the Vedamo platform (<https://www.vedamo.com>), have tried to help users by formulating the notion of the virtual classroom, as follows: "A virtual classroom is an online learning environment that allows for live interaction between the tutor and the learners as they are participating in learning activities". According to the www.techopedia.com version: "A virtual classroom is a teaching and learning environment in which participants can interact, communicate, view and discuss presentations". Learning actors can become involved with

learning resources while they are working in groups. All of that can be done in an online framework. The communication between the participants in the educational act often runs through a video-conference application that allows connecting several users simultaneously through the Internet, which allows the users to participate in lessons, practically, from anywhere. In our opinion, the variants of the listed definitions reflect only some aspects of a virtual learning environment, but most do not. Thus, the scope of the concept both from the perspective of its characterization as a computer product with certain possibilities and operating restrictions and from the perspective of the practical implementation in didactics of the given product as well as a digital instrument for education, are not presented relevantly in either version listed above. Before coming up with an outlined formulation regarding the idea and usefulness of this kind of product, we set out to analyze the most popular learning platforms under the conditions of a virtual classroom. These are a few in the Web, namely (see Table 1):

Table 1

The requisites for "virtual classroom" platforms

Ord. num.	The name of the product	Developer	Product access address
1.	Cisco Virtual Classroom	USA, Cisco Systems, Inc. Corporate Headquarters San Jose, California	https://www.cisco.com/c/en/us/solutions/industries/education/virtual-classroom.html
2.	Lash Dash Virtual Classroom	SUA, NameCheap, Inc.	https://www.learndash.com/characteristics-of-a-virtual-classroom/
3.	Berlitz Virtual Classroom	Germania, Berlitz Deutschland GmbH	https://www.berlitz.it/#
4.	EasyClass	SUA, GoDaddy.com, LLC	https://www.easyclass.com/
5.	Virtual Classroom	Netherlands, Amsterdam	https://www.myngle.com/virtual-classroom
6.	Vedamo	USA, San Francisco, subsidiary in Sofia, Bulgaria	https://www.vedamo.com/knowledge/what-is-virtual-classroom/
7.	Google Classroom	USA, Google LLC	https://classroom.google.com
8.	Sakai	USA, Stephanie Gerber Wilson.	https://www.sakailms.org/

For a broader and more objective approach, we decided to come up with a descriptive analysis on certain operating features and / or certain merits that highlight the products that are the subject of our study.

- 1. Cisco Virtual Classroom (CVC)** is promoted as a platform based on the Cisco Digital Network (Cisco DNA) architecture. The platform helps students and teachers and professors explore new forms of education through the use of computer networks. The CVC is positioned as a virtual environment with constant adaptation and protection.
- 2. Lash Dash Virtual Classroom** is a plug-in that takes the latest e-learning methodology and infuses it into WordPress. The product exists only in the English version; is positioned as a Flexible Learning Management service. The platform is equipped with examples and tutorials, and the teachers and professors who have courses on the

given platform have the opportunity to issue electronic certificates to the enrolled students.

3. **Berlitz Virtual Classroom** is a platform of Italian origin intended, in particular, for language training. The environment has multiple subsidiaries for direct contact, face-to-face learning, in several cities in Italy (approx. 11).
4. **EasyClass** is a non-profit organization that offers a free learning management system (LMS). This system allows educators to create digital classes where they can store online course materials; manages classroom discussions; it allows the organization of work with the students in several formats: carrying out the questioning of the students on the content of some modules and / or of the course exams; monitoring the success of the learners. The tutor has the opportunity to provide students with prompt feedback. Currently, the EasyClass platform is adopted by around 500 universities, colleges and schools in Europe, serving over 220 thousand educators and learners.
5. **Virtual Classroom** is a service that has two extensions: (1.) for corporate users and (2.) for tutor who work independently with students. Predominantly the platform is oriented to language courses' training. It is a virtual environment that makes the connection between tutor and learner even in situations when they do not know each other yet. The beneficiaries are offered training courses with standard costs for a set of courses or only a modular unit.
6. **Vedamo** is a platform with two extensions: (1.) Virtual Classroom and (2.) Learning Management System with two different payment opportunities and functionalities. The purpose of the developers was to create and implement an innovative e-learning solution for a wide range of learners. The VEDAMO virtual learning environment has been created to promote equal access to quality education for more people around the world. In 2019, the company was nominated in the "IT - Communications and Digital Education" category of the *Comenius-EduMedia-Berlin award*. The given virtual classroom has been integrated into the *Google Toolkit for Education*, as well as the *Brightspace kit* via D2L¹.
7. **Google Classroom** is a platform for teaching and learning management that supports the designation of multi-category teaching resources. The service provided is free of charge; it has been developed as a web product for schools by Google. The main purpose of the Google Classroom product, announced by the developers, is to streamline the file-sharing process between tutor and students.
8. **Sakai** is a virtual learning hosting platform that has the premium class tools for teaching and learning (awarded by de jure and de facto!). That is promoted as a product that is getting better and better every year. Independent research considers Sakai's pursuit of excellence is much better than other competing LMS platforms. Because of academic and scientific environments, the platform has been equipped with plagiarism detection mechanisms, streaming media and lecture capture software. The given source is free for community use. It was designed as an educational software product to support the teaching, research, and collaboration between the beneficiaries.

¹ Brightspace from D2L is a cloud-based learning management system (LMS) that helps K 12 institutes, universities and corporations run both mixed-format and online courses. Brightspace comprises three integrated platforms - the learning environment, the learning repository, and the ePortfolio.

"Virtual classrooms": definition of the concept and implementation in the practice

Based on analyzed, synthesized and set out previously arguments in our opinion, a Virtual Classroom platform can be defined as an **IT product created through Web-based technologies and / or Cloud Computing** which should be presented as a learning management system (Learning Management System) currently existing in several versions. Predominantly, given product **is equipped with multiple tools** for providing educational content as to support courses through video conferencing and / or webinar; to make the assessment and / or self-assessment of learners' knowledge; to monitor and adjust students success; to organize and conduct collaborative activities among the actors of the didactic act (learners, tutors, assistants, etc.) in synchronous and / or asynchronous working regime.

Since the current position of the student is an absolute one, the age range and the spectrum of competences of the people doing the studies is very wide: students from pre-university educational establishments (the primary, secondary, high school) to students from vocational, technical and university educational establishments (undergraduate and master's degree) and various continuing education courses (professionalization, qualification improvement, etc.).

Especially the diversity consideration of the potential users of "virtual classroom" type platforms has led to the emergence of certain learning models based on Digital Age-specific methodologies. These are the models that try to solve the problem of designing planned teaching activity to be run with the support of digital tools and / or digital resources in the educational process.

Some researchers wrote about different opportunities to implement virtual classroom:

- Akinyokun, O. L. Ch., Iwasokun, G. B. (2014) - have addressed aspects of designing and implementing virtual classroom systems in learning [5];
- Bower, M. (2006) - predominantly researched the theoretical-methodical landmarks of exploring virtual classroom platforms from the perspective of pedagogy [6];
- Gedera, D. S. P, (2014) - has dealt with the didactic experience of using the virtual classroom that has been applied even in her career [7].

In this context, the vision of Prensky, M. (2001) is extremely interesting to us. He is talking about the design of the teaching-learning-evaluation activities developed to be delivered in digital format. The scientist considers that the forms and also the ways of designing and delivering the educational content, should differ depending on who is the final beneficiary, i.e. the direct learner: "a native digital" or "a digital immigrant" [8].

From our own professional experience of interaction with the students of the Faculty of Computers, Informatics and Microelectronics of Technical University of Moldova, which correspond to some extent to the category of "the digital natives" (i.e. they are representatives of the generations of young people growing up surrounded by digital technology), we can affirm surely that digital content; organizing and conducting individual and group activities through learning management platforms; organizing and conducting electronic assessments through digital tools offered by such systems as Moodle, Kubbu, Google Quiz convinced us of the fact that:

- The use of the virtual environment platforms have been certified as a didactic form that is truly flexible and adaptable to the individual needs of the student and tutor depending on training; by the style of academic approach; the necessity of the time

management; and logistics (it is possible for the student to be or not to be present at the courses during the contact hours), etc.

- It is a paradox, but the freedom and flexibility of working on these platforms make the learners be more disciplined and develop the self-management spirit accordingly of their learning rhythm. This competence is more than important in daily adult life.
- Allows diversification of the interaction with colleagues and teacher or professor.
- It offers an incubation period for ideas. This psychological state is very necessary for the deep-thinking process. As this state of the creative silence can be sometimes shattered by the agitation from the classroom and that often happens in a standard regime of direct contact with colleagues and / or the tutor, we can use the virtual classroom environments as a didactical alternative of traditional courses.
- Applying the various ICT tools embedded in such platforms imposes some diversification of the teaching-learning-evaluation process.
- The way of learning on the virtual classroom's platforms is liked by the learners.
- The way of learning on the virtual classroom's platforms is liked by the tutor, too.

Although as in any new activity the use of virtual learning environments also has a certain degree of routine that can be perceived by the user as a deficiency, we consider that this state of affairs can be eliminated in case of motivation and / or self-motivation of the learner and / or the tutor (see Table 2):

Table 2

Disadvantages of using "virtual classroom" platforms

Ord. num.	For tutor	For student
1.	The development of original teaching materials to be placed in the system takes a long time.	The asynchronous working regime requires self-organization and self-motivation by the learner.
2.	The development of tests to be placed in the system also takes plenty of time.	There is a temptation to copy using other digital resources from the Web here.
3.	There are some difficulties until your students get used to such interaction here.	There is the illusion that no one is watching you here.
4.	The forming of a creative vision for developing electronic courses by the tutor also takes enough time.	Suspicion may arise that the tutor is obsessed while complicating their life.
5.	The worse is that the platform can fail.	A responsible student is upset, the one who is less responsible enjoys this situation.
6.	Not worse is that: not all educational digitalized content and not from all kinds of platforms can be cloned/saved.	A responsible student is disturbed about the circumstances, the one who is less responsible is happy.

Conclusions

We consider the analyzed ideas are valuable, innovative and useful from the perspective of disseminating and extending a correct perception of education in the digital age by stakeholders and decision-makers.

Upon the involvement and correct vision of teachers, professors, researchers, parents, learners, etc. depends the scaling that gets the using of digital tools and digital resources in education each day.

And from the intellectual potential and creativity of the engineers concerned with the development of digital tools dedicated to teaching-learning-evaluation depends the awareness of potential users, whether they are tutors or learners.

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