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TRADITIONAL LEARNING VERSUS E-LEARNING

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Abstract

Differentiating from the digital immigrants, who speak a “language” specific to the pre-digital era, the native digitals come to the fore by their own identity. Being built according to the specificity of the current society, it is marked by the influences of modern technology. In the field of education, e-learning covers a set of on-line and off-line applications and processes, which include a series of educational platforms and ways of learning based on web, CAI, virtual class, multimedia, etc. Compared to the other theories of learning, the cognitive theory of multimedia learning encourages the student to build a series of coherent mental connections, starting from multimedia material. The goal of this research is to make a comparative analysis between traditional education and e-learning. Starting from the features of virtual reality, we have focused on designing a sequence of training able to combine both the classical and modern approaches – based on the efficiency of the new educational technology. Being of an ameliorative type, our research starts from the premise that the educational process in the e-learning context is just as effective as the traditional one. It requires, however, a change in the pedagogical style and an up-dating of the way in which the training is being designed and done. Some forms of online learning (on-line and in the classroom) are likely to become the norm, because the students will choose one or several online courses to complete their training.

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1. Introduction

Virtual education is an alternative to the traditional educational environments. As *virtual schools* offer a new approach to courses, there can be seen an increase of them across the world. Schools of all sizes and profiles are attentive to online courses that are developing fast and that are gaining more and more ground. A *virtual class* is part of the distance learning platform, which usually includes course materials, themes, tests, assessments, and other tools outside the classroom experience.

Computer learning can be as effective as traditional learning, as most students use a wide range of applications in this area (organization and presentation, web browsing, email, social networking sites, etc.). Broadly speaking, by *e-learning* we understand the totality of educational situations in which ICT means are significantly used. The technical facilities of the e-learning platforms meet the students' desires and aim to fulfil their training needs. A good correlation between the technical and technological aspects and the pedagogical ones is necessary to accomplish this.

Used a few decades ago as a reaction to behaviorism, cognitive learning defines learning as a search for the knowledge stored in memory, after the primary processing of information, the formation of mental images and their abstract processing. The traditional paradigm of learning focuses on: the transmission of knowledge, the reflections of the teacher, on given structures, abstract symbols, endorsement-retention-reproduction, finalizations and targeted applications.

Essentially objective, knowledge in itself is independent of the student's mind, but he/ she accomplishes it subjectively, through processing, constructions, own interpretations. Different from knowledge, through this process of internalization, learning is influenced by support materials, by the independent and group working conditions, by the strategies used, by its ways of expression and communication in various forms (Joița, 2006).

Making the transition from behaviorism to constructivism, cognitive learning represents assimilation, a short or long lasting acquisition, an active process of organizing mental structures. Completing constructivism by emphasizing the relationship between the mental and the material dimension, constructivism considers that learning can most effectively happen when people are active in making tangible objects in the real world. S. Papert, the promoter of constructivism, asserts: Constructionism shares constructivism's view of learning as "building knowledge structures" through progressive internalization of actions. It then adds the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe (Papert, 1991, as cited in Ackermann, 2001, p. 4).

Anchored learning supported by multimedia, based on the knowledge-technology relationship, is a type of learning that facilitates the practice of resolving skills in students. Computer use in education has activated multimedia and made it more interactive. It is considered that interactivity is important in the context of computer-assisted training, this type of instruction conducted in interactive learning environments is clearly superior to that performed in a traditional didactic context (without interaction) in terms of school performance (Thomas, Alexander, Jackson, & Abrami, 2013).

The central element of *the cognitive theory of multimedia learning* (CTML) is that according to which the computer and multimedia learner will try to build a series of logical connections between words and images. Being born in the late 1980s under the name of "model of meaningful learning" (Mayer, 1989),

the theory has been consolidated over time, being under a number of names (eg “generative theory” – Mayer, Steinhoff, Bower & Mars, 1995, “Generative Theory of Multimedia Learning” – Plass, Chun, Mayer, & Leutner, 1998 and “the dual model of processing multimedia in learning” – Mayer & Moreno, 1998).

2. Problem Statement

2.1. Aspects of the virtual environment

Technology is increasingly used to facilitate active and collaborative learning in order to better engage students and accompany them to various learning experiences so as to meet the needs and expectations of the learners from different cultural backgrounds, with different learning styles. By defining e-Learning from a technological point of view it sends to the analysis of the relationship between e-learning and certain closely related concepts: learning using the Internet, Web-based learning, online learning and computer learning. Online learning is a systematic learning process, supported by electronic technologies.

In virtual classes, just as in the face-to-face environment, *resources* represent an important part of the learning experience:

a) *The human resources* are the centre of attention. The most important actors in the virtual class are the learners. However, there is a whole team that interacts and contributes to e-learning. The tutor is the one who has the epistemic authority and manages the course, leads the students in the learning process, motivates them, interacts with them and evaluates their activity. The Designer (the Web Designer) is the person specialized in designing the content of learning in the online environment. He/ She is equipped with information and has the skills needed to design the content. The technical group is the one that provides the technical part of the entire learning system, without which it cannot take place in the E-learning environment. The technical group is specialized in hardware and provides help for technical problems.

b) *The information resources* refer to any digital resource that can be used to support learning. Gibbons et al. (2002) prefer the term instructional object, describing it as any element “that can be independently drawn into a momentary assembly in order to create an instructional event” (as cited in Wiley, 2007, p. 3). Interaction with the content involves the interactions of the students with the course materials and the key concepts that have to be learned. Some research have studied the online learning approaches and found that students interacted with the course content more often than they interacted with the instructor and colleagues (Ekwunife-Orakwue & Teng, 2014).

c) *The procedural resources* provide different methods of communication and learning management. Large educational packages come, as a rule, with their own ways of communication (eg chat platforms or forums). Integrating technology in teaching and making use of the formative possibilities the constructivist methods and tools have (such as, for example, the WebQuest technique) we can achieve the paradigm shift in education. It states that students today have grown with computer games, and constant exposure to the Internet and other digital media has shaped the way they receive information and learn. Relying on constructivist principles and using methods specific to the Internet, this technique was developed and implemented in 1995 in the US by Bernie Dodge and Tom March, teachers at San Diego State University. Computer-assisted training (CAT) involves a different approach to learning that introduces a different way of learning.

d) *The material and technical resources* capitalize on the new information technologies. Most of the virtual technologies have a content framework to share the instructor's PowerPoint, a painting in which an instructor can write breakout rooms for the group activities, text-chat so that the instructor and the students can interact using words and emoticons, chat to talk through the microphone or phone. The web board allows teachers to explain ideas and work through exercises on the online forum via the internet. The virtual board also provides the ideal opportunity for tutors to bring additional learning resources, as they can be used to share any application that might be beneficial for the students.

Unlike television, the internet is generally considered as a useful resource for learning. However, some reservations need to be kept, because the more we communicate online, the lower the quantitative and qualitative face-to-face interaction would be: “Excessive TV and net consumption is considered by many teachers to be a great danger, responsible for generalizing the attention deficit at lower ages and the inability to express verbally, but also for structuring an exclusively hedonistic (pleasure-centered) culture and a neo-consumerism culture (centered on everything new), centered on waiting or searching for an incessant psychological stimulation from the outside through a screen, and a gratification (...)” (Cuciureanu et al., 2014, pp. 73-74).

A virtual learning environment is a social and informational space where learners have an active role. It is not limited to distance learning, although the differences between the two educational solutions tend to fade, to this contributing the new forms and educational solutions that are born to fit the technological development, such as m-learning. These features of the virtual environment are supplemented with the physical environment: although most of the learning activities are carried out remotely, with the support of digital devices, a virtual learning environment overlaps with the physical environment at least partially (referring to the e-learning variant known as blended learning) (Dillenbourg, as cited in Ceobanu, 2016, pp. 25-27).

2.2. Reference points of learning

Considered a process of acquiring some acquisitions or a behavioral experience by an individual, as a result of repeated situations or practice, learning is an integrative and complex concept. According to G. Claus (1977), learning is “a superior form of conscious processing of information through which the body reproduces subjectively, characteristic objective structures of the environment” (as cited in Cerghit, 2002, p. 158). We observe that “in the initial definitions of learning, it was seen as an activity determined from the outside of the person (especially the behaviorist paradigm was reported to this perspective), while it is currently considered that learning is primarily determined from the inside, surpassing the first approach (the cognitive-constructivist paradigm operates with this last explanation)” (Frăsineanu, 2012, p. 28).

Among *the advantages of traditional learning* there are: direct, efficient feedback, the emphasis of the development of arguments resulting from the existence of a large amount of knowledge to be retained, the receptivity of the teacher in relation to the students' reactions, the use of some established methods (which have passed the test of time), the facilitation of face-to-face communication, the transmission of knowledge in a predetermined form.

Compared to the classical formula of learning, *the e-learning approach* has the following *advantages* (Marinescu, 2007, pp. 76-77): e-learning is not only a long-distance learning process but also an actual meeting, individual or collective tutoring, a regrouping and a concrete physical presence –

sequential and temporary, of course; it circulates a huge amount of knowledge with a high degree of updating; it makes the educated person in the position to work intensely, by himself/ herself, through unilateral concentration to solve specific problems; it respects the personal working rhythms, each learner managing his/ her own obligations and the time necessary to accomplish them. These *advantages* are added to the following: it has simple and flexible logistics, it saves time, it is accessible and mobile, it uses different forms of content (video clips, dynamic presentations, forums and discussion charts), it can be both synchronous and asynchronous, it is presented in modules, it uses modern methods and means of learning, it facilitates learning management and self-management, it has a large storage capacity and it capitalizes on the external links, Power-Point slides, audio and video documents, etc.

There are a number of differences between traditional learning and e-learning. The first relates to a linear and predefined organization of the pedagogical path and has no immediate link with the operational activities; the second is aimed at the adaptive progression of each one of them, depending on the situation and it is integrated with the operational activities (idem, p. 78); in traditional learning the results are the ones that matter, while in e-learning the interaction process is considered more important than the results (Dillenbourg, 1999; Mercer & Howe, 2012). If the aspects of planning, monitoring and evaluation are the attribute of the teacher in traditional learning, in e-learning these also include the student, and can be seen as part of the socio-emotional development (Volet, Summers, & Thurman, 2009). If the content was important before, it is now a pretext for training.

2.3. The cognitive theory of multimedia learning

Unlike behaviorists, cognitivists focus on individual and developmental differences that occur in cognition. This is one of the reasons why there is not a single cognitive model of learning. *The cognitive theory of multimedia learning* was created by Mayer (1995). The theory can be summarized as having the following components: (a) a dual channel structure of visual and auditory channels, (b) limited processing capacity in memory, (c) three memory stores (sensory, working, long-term), (d) five cognitive processes of selecting, organizing, and integrating (selecting words, selecting images, organizing work, organizing images, and integrating new knowledge with prior knowledge), and theory-grounded and evidence-based multimedia instructional methods. Mayer explained that there are three cognitive processes necessary for a meaningful learning: selection, organization, and integration. The multimedia techniques of its research have as their main purpose these processes and the objectives of designing multimedia instruction for a meaningful learning refer to certain principles, among which: the coherence principle, the segmenting principle, the personalization principle.

Learning can be measured by tests of retention (i.e., remembering the presented information) and transfer (i.e., being able to use the information to solve new problems). Our focus is on transfer because we are mainly interested in how words and pictures can be used to promote understanding.

Mayer (2012, p. 8) argues that meaningful learning from words and pictures happens when the learner engages in five cognitive processes (figure 01):

1. Selecting relevant words for processing in verbal working memory;
2. Selecting relevant images for processing in visual working memory;
3. Organizing selected words into a verbal model;
4. Organizing selected images into a pictorial model;

5. Integrating the verbal and pictorial representations with each other and with prior knowledge.

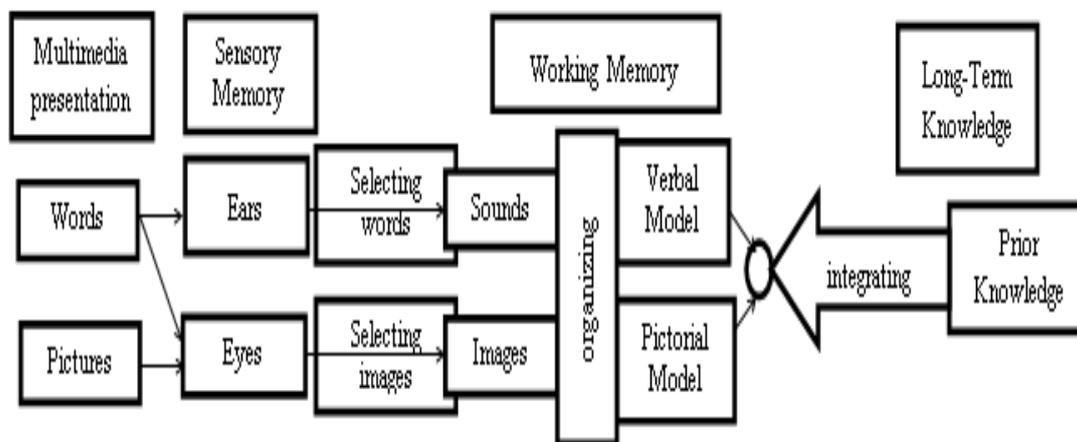


Figure 01. The Cognitive Theory of Multimedia Learning (Mayer, 2012, p. 7)

As its author states, “the theory incorporates elements from classic information-processing models, such as two channels from Paivio’s (1986) dual-coding theory, limited processing capacity from Baddeley’s (1986, 1999) model of working memory, and a flowchart representation of memory stores and cognitive processes from Atkinson and Shiffrin” (1968) (as in cited Mayer, 2012, p. 15).

3. Research Questions

Our research starts from the premise that the educational process in the context of e-learning is as efficient as the traditional one. Taking into account the growing interest in e-learning and the specificity of the generation that is growing in the digital era, we raise the issue of adapting the educational offer to the demand of the native population. *The questions* we ask are the following: Is e-learning superior to traditional learning? How much do students understand the difference between the two forms or types of learning? What is the role that students give to e-learning?, How can we design and implement a training program that capitalizes on the benefits of e-learning?

We start the research from the following *hypothesis*: If e-learning responds better to the needs and expectations of the younger generation, then the current training must combine classical strategies with those specific to the virtual environment. The independent research variable is *The technological model* proposed by us, which exploits the e-learning applications. We have proposed an ameliorative research, in which we first tested the students’ level of knowledge about these learning modalities and then merged (during the second semester of the academic year 2017-2018) the classic strategies with the ones specific to the e-learning applications, aiming at informing and forming from this point of view.

4. Purpose of the Study

The purpose of our research is to design and implement a training sequence for some of the psycho-pedagogical disciplines in the education plan of the students enrolled in the Psycho-pedagogical Training Module, starting from the combination of the traditional and e-learning training.

The objectives pursued include:

- Carrying out the comparative analysis between traditional learning and e-learning;
- Capitalizing on aspects specific to the cognitive theory of multimedia learning;
- Centralizing the students' opinions about e-learning features;
- Designing and implementing a Technological Model for the accomplishment of e-learning that will also benefit from the advantages of classical learning;
- Drawing up conclusions on the practical value of this Technological Model and proposing suggestions on how to up-date training in the technological era.

5. Research Methods

We propose a program for using web tools in the *Class Management and The Sociology of Education*, disciplines in the curriculum of students who are preparing to become teachers and therefore work in a virtual school. We thought this program as a combination of the classic, current design and development of the pedagogy course and seminar, and the modern version that exploits the new educational technologies and it seems to respond better to the current demands (figure 02).

In order to achieve the objectives we have documented by studying the specialized literature and applied a *questionnaire* to the students from the following faculties of the University of Craiova: Bachelor's Degree – 78 students (Faculty of Sciences) and Master's Degree – 45 students (Faculty of Sciences, Faculty of Automatics, Computer Science and Electronics, Faculty of Electrical Engineering, Faculty of Mechanics). The questionnaire contains questions about the strengths of the two forms of learning and the implications of their combination. It was applied in two stages: January 2018 and June 2018 (before and after the unfolding of the didactic activities designed after a *Technological Model* that combines traditional learning with e-learning).

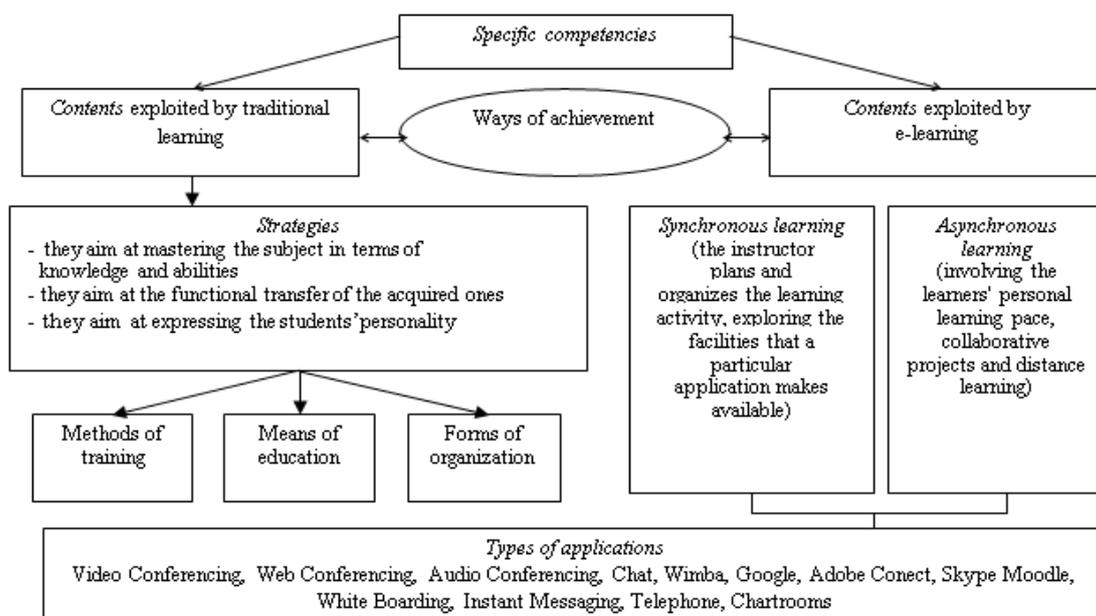


Figure 02. The technological model combining traditional learning with e-learning (our representation)

The questions of the questionnaire (the items) are the following: Do you know the meaning of the e-learning concept? Do you know the characteristics of e-learning? Can you distinguish between traditional learning and e-learning ?, Do you consider the proposed Technological Model to be effective?

6. Findings

The answers received from the students are listed in the table 01:

Table 01. The answers provided by students before and after the implementation of the Technological Model

Level of training	Items	Before the implementation of the Technological Model		After the implementation of the Technological Model	
		Yes	No	Yes	No
Bachelor's degree (year III)	1	31 (39.74%)	47 (60.26%)	76 (97.43%)	2 (2.56%)
	2	27 (34.61%)	51 (65.38%)	69 (88.46%)	9 (11.53%)
	3	67 (85.89%)	11 (14.11%)	72 (92.31%)	6 (7.69%)
	4			66 (84.62%)	12 (15.38%)
Master's degree (year II)	1	36 (80%)	9 (20%)	45 (100%)	0 (0%)
	2	33 (73.33%)	12 (26.67%)	43 (95.56%)	2 (4.44%)
	3	43 (95.56%)	2 (4.44%)	44 (97.77%)	1 (2.22%)
	4			40 (88.89%)	5 (11.11%)

By analyzing the answers of the students, we find the following:

- If the students of the Master program knew about 80% of the meaning of the e-learning concept, those who enrolled in the license program only knew in a proportion of 39.74%. After the application of the intervention program, the percentages increased significantly among both categories of students, which partly confirm its relevance. The percentage difference is higher for undergraduate students (over 50%), which explains their receptivity to the new information technologies and the favorable attitude towards the use of specific applications in formal education.

- As for the knowing of the e-learning features, the percentage of the undergraduate students who know the specifics of the e-learning specialization program grew significantly in the post-test (by 53.85%) and in the case of the master program students it increased by 22.23%. The additional information comes from capitalizing on modern applications, as they are used in training activities.

- Compared to the total number of students involved in the research (123 students of which: 78 - license and 45 - master), the number of those who could distinguish between traditional learning and e-learning before the intervention is 110. After applying the independent variable, their number increased slightly, 116 responding affirmatively to item 3.

- As far as item 4 is concerned, over 80% (84.62%) of the undergraduate students consider our program to be effective, the percentage of the master students being similar to that of the undergraduate students (88.89%).

As a result of this analysis, we find that the established hypothesis is confirmed, the reference to the new technological applications influencing the modalities and the learning strategies. The students are receptive to the new, they use a range of gadgets in learning and expect the educational offers to include new information technologies.

We propose the use of e-learning in initial teacher training courses, and *the suggestions* that we make include: improving training techniques and methods (involving both students and teachers), rethinking the training programs to capitalize on the benefits of the new information technologies, changing the attitude of the main actors (teachers and students) towards e-learning.

7. Conclusion

Depending largely on the learning environment, the training programs should take into account the new information technologies that have got into schools as well. The development of Information and Communication Technology (ICT) has graded learning, oriented it towards the person, allowing educators to choose their content and tools according to their own needs and interests. Web-based learning has many advantages and reconsiders the teacher-student relationship.

As we move more towards training in e-learning and Internet training, the problem of the student's cognitive overload - when using multimedia - becomes more complex. Therefore, specialists are looking for solutions to this problem, but also effective ways of implementing new technologies in the educational process. These take the form of theories whose value is given by the comprehensive manner in which it explains the relationships between the variables involved, the degree of applicability of the ideas proposed and the plus-value to the educational act.

The young generation has grown connected to the Internet and feels comfortable in online engagement. The opportunities brought by virtual technology derive from its main features and advantages, one of the most important features referring to the existence of e-learning platforms.

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