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Opinion article

EMBODIED LEARNING: CONNECTING PSYCHOLOGY, EDUCATION, AND THE WORLD

THEA IONESCU[1] & ADINA GLAVA[2]

ABSTRACT. This opinion article is aimed to bridge new approaches in psychology with the efforts to change schools that are widely advocated in educational sciences. To reach this aim we review the embodied cognition approach and the problems that schools face today, and then we argue for the role that embodied learning might play in the process of changing education as it is pursued today. We conclude with ideas on the importance of putting the learner back in the world when he/she learns in order to be able to better adapt to the world.

Key-words. *Embodied cognition, embodied learning, grounded teaching, imaginative education*

ZUSAMMENFASSUNG. Dieser Artikel ist eine Stellungnahme, die darauf abzielt, neue Ansätze in der Psychologie mit den Bemühungen den Schulen zu verändern, die weit verbreitet in Erziehungswissenschaften vertreten sind, zu überbrücken. Um dieses Ziel zu erreichen, überprüften wir die verkörperte Erkenntnisansatz und die Probleme, mit denen Schulen heute konfrontiert sind und dann, behaupten wir auf die Rolle, die verkörpertes Lernen in den Prozess der Veränderung der Bildung, so wie sie heute betrachtet wird, spielen kann. Der Abschluß besteht aus Ideen über die Bedeutung die Lernenden zurück in der Welt zu stellen, damit sie in der Lage sind, sich besser an die Welt anzupassen.

Schlüsselwörter: *verkörperte Kognition, verkörpertes Lernen, gegründeter Unterricht, phantasievolle Bildung*

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Learning

Learning is one of the fundamental issues in psychology and education, and yet a poorly understood one. Humans learned since their existence on Earth and their learning produced the most amazing advances in the world. However when science tried to explain what is learning progress was much slower.

Psychology has made a lot of advances in analyzing the process of learning, and has accumulated data on conditioning (via the behaviorist approach, Skinner, 2005), on the cognitive processes that are involved in learning (via the cognitivist approach, Byrnes, 2001), and also on the role of the social context in the learning process (via the social constructivist approach, Palincsar, 1998). For example, we know that reinforcements work but also that we don't have to give only positive feedback due to concerns for the child's self-esteem, but to offer accurate feedback to have efficient learning outcomes (Poole, Nunez & Warren, 2007). Also, we know that metacognitive skills are essential for high performance (Schneider, 2008). With regard to the social elements that influence learning, we know that schools that are organized as "communities of learning" have higher success because they involve the group in the learning process and offer meaning to learning from the group values (Palincsar, 1998). However, when it comes to applying research data to education and have children learn better and find meaning in school settings, the results are not that straightforward. Some authors even argue that psychology did not find yet "an account of learning that can explain how humans come to understand, particularly understanding that is grasped meaningfully." (Stolz, 2015, p.11).

At any given time, the educators' understanding of what effective school learning situations mean is informed by the theories on how general learning occurs. Thus, classical educational systems developed a long tradition of a Piagetian approach in conceptualizing learning and cognition in school age children. This cognitivist approach stands at the very base of structuring the educational systems themselves (different school levels are associated with the Piagetian stages of information processing). While recognizing the valuable references that contributions of Piaget offered to the understanding of cognitive development and the important implications they have for the present understanding of how school learning could be supporting at different school levels and ages, we argue that the Piagetian model invites educators to categorize the school learning means

and instruments according to their main utility in different school ages and, consequently, to disregard the instructional potential that early ages instruments continue to have in supporting learning that more advanced ages students perform.

Thus, while teaching practices at preschool and primary school levels are saturated in means that support the direct interaction of students with aspects of reality the child is to understand, starting with the last years of primary school and throughout the lower secondary school there is an obvious focalization on overpassing the use of concrete thinking tools and supporting the development of formal cognitive operation through highly abstract teaching. Starting with these ages, at the school curriculum level, many highly valued school subjects include abstract, depersonalized and decontextualized learning contents (Cucoş, 2014), associated with education as symbol manipulation. Most of the school contents are emptied by the aspects that could physically, emotionally or creatively involve students in the construction of meanings. Students tend not to recognise the relevance of the academic contents for real life problem solving, and even though sometimes they are successful with this type of learning, the results prove not to be persistent in time or transformative. The long-time consequence is their lack of involvement and self-responsibility for their own learning as well as their lack of motivation for learning in general and for certain more abstract school subjects in particular. Some of the latest international evaluations such as PISA 2012 (Programme for International Student Assessment, 2012) highlight these realities for the Romanian 15 year old participant students.

On the other hand, school learning represents a particular type of learning, supported by external factors that act as mediators of the process (Engeström, 2014) and are articulated in the so-called school culture. The traditional schools of nowadays society promote a school culture that reflects the general western mentality on schooling, students and learning. At the core of this institutional culture stands the model of school as an industrial production line (Robinson, 2011). It is a structure, initially justified by economic reasons, that proved to have many important shortcomings because of its linearity, conformism, and antisocial orientation (Robinson & Aronica, 2015) and that is increasingly criticized by the promoters of the alternative more ecological model to

education and learning. Thus, to the industrial model of schooling it is opposed the agricultural, organic model that recognizes the fact that human beings do not develop in linearly and totally predictable directions but in diverse and unpredictable ways that value the educational potential of school contexts in various manners. The main principle beneath this model is the fact that in the right school context focused on the promotion of individual wellbeing, the ecological approach to individual development, the activation of personal potential and care, each student will develop and his learning will be visible (Robinson, 2011; Robinson & Aronica, 2015). Yet, the implementation of the organic perspective on education and learning would mean a paradigm shift with important implications for the roles of the teachers, educational aims, curriculum approaches and management of the educational resources and strategies. By taking the responsibility for this changes, school should develop educational tools which would support a more personalized, authentic and relevant learning that involves the learner with all his physical, cognitive, emotional and motivational resources.

As it can be seen above, a major problem that drags on is explaining the mechanisms of learning and then translating them into an efficient school curriculum.

A body in the world

Cognitivism and constructivism have had an important effect on education. However, cognitive psychology is witnessing now a shift in focus: a come-back of embodiment[3]. Even if it is not widely embraced, the embodied cognition approach is pointing to data that shows that cognition is not just about symbols and their manipulation (Barsalou, 2010; Clark, 2011; Glenberg, 2010; Glenberg, Witt & Metcalfe, 2013; Gomila & Calvo, 2008; Ionescu, 2011; Ionescu & Vasc, 2014; Wilson, 2002). More precisely, this post-cognitivist approach reunites cognition with the body and the world[4] and speaks against the view that cognition

[3] Embodied cognition has roots in philosophical traditions like the ones of Merleau-Ponty or Heidegger.

[4] Recently the term *embodied* is used to also refer to the contextual factors that shape cognition, and we will proceed like this too in this paper even if *grounded* might be a better term that includes all relevant components.

refers to higher-order processes that separate themselves from sensory-motor aspects, from the body's affordances and from the affordances of the environment.

If we consider for example language which is a prototype of symbolic processing, recent data show that motor simulations aid language understanding in adults (Glenberg, Sato, Cattaneo, Riggio, Palumbo & Buccino, 2008) and that the body's posture helps children match a heard word with the correct seen object (Morse, Benitez, Belpaeme, Cangelosi & Smith, 2015). Moreover, in the case of mathematics, another paradigmatic case of symbolic thought, studies show that perceptual processes (e.g., spatial proximity) influences adults performance (e.g., algebraic reasoning) (Landy & Golstone, 2007). Advocates of embodied cognition argue today for incorporating bodily elements and the context into how we conceptualize cognition (Smith, 2013).

Although this approach has gathered evidence for deeper links between the body, the context and cognition than previously thought, it cannot explain so far abstract thinking *per se*. There are complex analyses of online and off-line processing, but it is exactly the off-line type of processing that is not understood yet, together with the way we arrive at understanding abstract words, namely those with no apparent link to concrete elements, like friendship or compassion. There are attempts to explain abstract processing (see Gallese & Lakoff, 2005 and Johnson, 2015 for an account for metaphorical understanding, and Barsalou, 2003, 2008 for situated simulation). For instance, the situated simulation account states that representations are not amodal but multimodal: they are simulations of the multimodal states that were active when the brain learned a concept (Barsalou, 2008). Nevertheless, none of the current approaches have succeeded so far in explaining all kinds of abstract reasoning (Barsalou, 2010; Hommel, 2015). However, the question remains: what if knowledge and cognitive operations are fundamentally linked in every moment to the body and the world it navigates?

Embodied learning

One important consequence of the embodied cognition approach may be the understanding of the learning process. If cognitive processes are embodied then using the body and the context during learning should aid knowledge

storage and retrieval and also the constitution of abstract thinking. As such we arrive at the concept of embodied learning.

Recent developmental data supports the idea of embodied learning. For example, in studying language learning researchers discovered that children use posture to map names to objects (Morse et al., 2015). The authors used a humanoid robot model to show that the body-centric spatial location is involved in object name learning: specifically posture binds the multimodal features of names and objects (importantly, names and objects were not encountered together during learning). Tests with infants then showed that indeed body-centric spatial contingency matters for mapping names to objects (Morse et al., 2015). These results point to the fact that learning symbols (i.e., verbal labels denoting object names) is done via the body and its position in space during learning and it is not just some "pure" cognitive process. In another series of studies, Needham and colleagues (Needham, Barrett & Peterman, 2002; Needham & Libertus, 2011) have found that experience with reaching via Velcro-palmed mittens that stick to toys (i.e., motor experience) enhances infants' abilities to independently reach for toys but also to interpret the reaches of other people as goal-directed. Therefore, the authors argue that "learning and cognition are constrained and facilitated by the child's changing motor repertoire" (Needham & Libertus, 2011, p. 119).

In a recent study we showed that language learning in preschool children is facilitated if teachers ground their teaching in the systems children use when learning (Ionescu & Ilie, submitted). 4 to 5-year-olds learned more new words and idioms in the condition in which the teacher involved them while listening to a story by using additional visual, auditory, tactile, and motor cues. This speaks for the role that the sensory-motor systems have for language learning in preschoolers (Ionescu & Ilie, submitted). Older children too seem to use embodiment in learning. James (2010) showed that handwriting experience helps children who learn how to read to better recognize letters because it provides them with a distinct visual-motor program for each letter that facilitates the recognition of written language; this effect was not observed for children who used typewriting.

If cognition is embodied and if embodied learning is more efficient for cognitive development than maybe schools should change their style of teaching to promote this kind of learning in students at all ages (Ionescu, 2014).

Principles of embodied learning as vectors for change in school learning

Principles of embodied learning encourage educators to recognize and explore the complex potential different variables that the learning situations have for supporting students in getting relevant and authentic learning experiences. The focalization on teaching and learning strategies that allow for a multidimensional involvement of students in their own learning is a key for creating school situations that support embodied learning.

The constructivist approaches to school learning emphasized the formative potential of **situated learning models** such as case based learning, project based learning, scenario based learning and of **inquiry based learning** (models focused on developing more authentic and student centered learning situations). These models have in common the fact that they cater for study contexts where the cognitive involvement of students is completed by ways of sensorial, motor and emotional involvement in their own learning, options associated in the research based literature with effective learning (see Hattie, 2014; Marzano, 2015). Moreover these models offer the possibility to provide students multiple ways of accessing the knowledge, by including various "lines of attack" and "entry points" (Gardner, 2014, p. 195) to understanding. The existing research supports learning by doing and by integrating complex new experiences as relevant ways of meaningful learning.

Principles of experiential learning consistently promoted in Romanian preschool and primary school curriculum in the latest years is associated with complete involvement of students in self-generated and self-directed learning according to relevant objectives and through an authentic anchoring into the physical and social elements of the study context. The student has a reasonable amount of control over the nature and direction of learning according to his interests and study needs. The key elements of experiential learning are direct contact with the reality, reflection, and quality of the learning relationships with the teacher and peer students (Paloș, 2012). On the other hand, the learning by doing models of education emphasize alternative ways of getting knowledge that seem to be associated with over passing the disciplinary boundaries and involving students' sensibility and creativity in the process of reality exploration and problem solving.

An interesting and fresh perspective on school learning that could offer valuable reference points for supporting embodied learning comes from the work of Imaginative Education Research Group (IERG) from Simon Fraser University in Canada. Kieran Egan, the coordinator of IERG, developed an educational model focused on the conceptualization of five types of understanding that humans acquire starting with the very early stages of development and up to adulthood, in association with different stages of language use. The stages are suggestively named: somatic understanding (associated with the preverbal level of language use), mythological understanding (associated with verbal language), romantic understanding (connected with written language), philosophical understanding (in relation with capability of using the theoretical language) and ironic understanding (connected with the use of reflexive language).

The passing through the five stages of understanding is not necessarily related with a certain age interval but rather with certain cultural determinations and contexts of "the time and space where children develop" (Egan & Popenici, 2007, p.51). Each type of understanding enriches the person with new capabilities and means for grasping the meanings of the world. In the same time, there is no hierarchy of more or less functional or desirable stages. On the contrary, the new capabilities are more functional if they work together with the previously acquired ones. Each stage remains active and represents a perspective that in itself or together with other types contribute to construction of meanings and knowledge (Egan, 1997; Egan & Popenici, 2007). Each type of understanding is related with a set of cognitive instruments or tools that can enhance the potential of students' minds (Egan, 1997).

At the foundation of Egan's theoretical frame there are two main theories: the theory of cultural recapitulation, that basically supports the idea that traditional cognitive tools the humankind used in cultural history may be recovered and have a potential for supporting the effective understanding, and the socio-cultural theory of Lev Vygotsky. Thus, the cognitive instruments Egan presents have cultural determinations (Egan & Popenici, 2007) and have the potential of involving children in their own learning in a physical, emotional and imaginative way. In Egan's view (Egan, 1997, 2007), tools such as corporal experience, rhythm and rime, gestures and communication offer the very young child the first instruments for grasping the meanings of reality through whole

body involvement in learning. These tools encourage sensory-motor involvement in reality exploration. They are at the bases of the level of understanding associated with verbal communication which are: the story (narrative) with its binary opposites that organize the reality and give children a sense of knowledge unity, metaphors and humor that exhibit the important meanings, mystery and play that emotionally involve children in exploration and situated simulation. The more advanced ages associated with acquiring the command over the written theoretical and reflexive language add to these initial instruments, other sets focused on construction of general understanding and organized knowledge. Cognitive instruments such as: collections, extremes and limits, curiosity, searching for generality and limits of theories, epistemic doubt and reflexivity give the learner that already is capable of a systematic understanding of reality, a sense that knowledge is related with his own physical, cultural and historical perspective (Egan & Popenici, 2007). The use of these tools within educationally guided contexts complexly involves students' imagination as a source for situated simulation learning.

In our view, the theory of imaginative education offers a comprehensive frame for considering the effort of learning as a process that employs a variety of thinking tools through which students become emotionally and creatively involved in and attached with the knowledge. By implementing such tools in the creation of meaningful learning situations, teachers promote a type of school learning that is grounded within the physical, experiential and cultural context of the child.

Concluding remarks

A major aim for future studies is to understand ***how*** the body arrives at abstract thinking. It may be time to change our lenses to include in our studies all the elements embodiment hints to in order to accurately explain cognition in general and learning in particular. The consequence would be a better suited education; a curriculum that supports natural learning and helps individuals to use their endowments in order to optimally adapt to the world.

It does not matter how many curricular changes we make, how much knowledge we put in or take out from handbooks (this kind of change happening a lot in an ever reforming educational system in Romania) but how we teach children that knowledge, namely how we use in teaching the way children learn. In other words, what needs to be changed is the way we shape children's knowledge learning according to how human organisms learn. We need to put cognition back in the whole organism and in its context during learning in schools, and to teach it by not focusing only on it (i.e., cognition for the sake of cognition). We don't mean that at any age we need to literally move our bodies in order to understand and learn. What we do mean is that we need to look at a larger category of factors when we want to make understanding happen: it is not just about cognitive operations, but also about emotional states, past experience to connect with new knowledge, present context in interaction with how the body acts. Moreover, schools should teach children to coordinate what nature endowed them with (Schwartz & Goldstone, 2015).

The embodied approach might serve not only to unify psychology as Glenberg and his colleagues argue (2013), but also to connect psychology to education in a more efficient way by pointing to more accurate mechanisms of the learning humans do as embedded beings in the world (natural learning). With the help of this approach, psychology would understand more about human functioning, education would become more meaningful for individuals, and both would better reach their goal of helping humans adapt to the world. For this end we recommend grounded teaching - a style of teaching that is grounded in all the systems children use when learning (Ionescu & Vasc, 2014).We hope that this opinion article has provoked more questions than answers in the minds of the readers and we invite authors from the related fields to submit future articles that tackle the complex problem of the learning mind-in-the-body-in-the-world.

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THE RELATIONSHIP BETWEEN EDUCATIONAL PROFILE, LEVEL OF CAREER INDECISION AND OF PERCEIVED SELF-EFFICACY REGARDING THE CAREER DECISION-MAKING PROCESS AMONG ADOLESCENTS

CLAUDIA CRIȘAN[1], SEBASTIAN TURDA[2]

ABSTRACT. Career indecision represents one of the key aspects in the field of vocational psychology. The present study, with a correlational design, aims to investigate the relationship between educational profile, the level of career indecision and the career decision-making self-efficacy among the late adolescents (N=160). The results showed that there is a significant positive correlation between career decision-making self-efficacy and students' educational profile, which means that there is a moderate association among these variables.

Keywords*: career indecision, career decision-making self-efficacy, educational profile*

ZUSAMMENFASSUNG. Die Unentschlossenheit von vielen Personen im Bereiche der Karriere ist eine der wichtigsten Aspekte in der Berufspsychologie. In der vorliegenden Studie, die mit einem Korrelations Design analysiert wird, zielt man darauf ab, den Zusammenhang zwischen Ausbildungsprofil, das Niveau der beruflichen Unentschlossenheit und die Karriere Entscheidungsselbstwirksamkeit bei den späten Jugendlichen (N = 160) zu untersuchen. Die Ergebnisse zeigten, dass es eine signifikante positive Korrelation zwischen Beruf Entscheidungsselbstwirksamkeit und Bildungsprofil der Studierenden gibt, was bedeutet, dass eine gemäßigte Verband zwischen diesen Variablen existiert.

Schlüsselwörter: *beruflichen Unentschlossenheit, Karriere Entscheidungsfindung, Ausbildungsprofil*

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Background

The transition from secondary school to tertiary level of education on the job market requires adolescents to make important decisions regards career choices. Restrictions regarding alternatives or options can lead to career indecision, which often is associated with anxiety, depression, lower life satisfaction and maladjustment (Creed, Prideaux & Patton, 2005). The process of career exploration and decision making can be a particularly stressful time in an adolescent's life and sometimes the adolescents have to recourse to coping mechanisms such as placing the responsibility for making a career decision onto others and may even delay or avoid making a choice, which could ultimately lead to a less than optimal decision (Gati & Saka, 2001).

Career indecision represents one of the major issues in the field of vocational psychology (Brown & Rector, 2008; Savickas, 2006). This concept began to be increasingly studied as a result of increased personnel fluctuation rate, job transitions and the behavior that adolescents frequently adopt (Fouad & Bynner, 2008). Therefore, career indecision has been defined as the inability to make decisions in various contexts and situations (Gaffner & Hazler, 2002; Patalano & Wengrovitz, 2006; Di Fabio & Palazzeschi, 2012), respectively to face up the challenges that involve defining in a realistic way the vocational direction (Gati, Krausz & Osipow, 1996). Literature review has shown that some personality traits and some emotional aspects play a significant role in explaining the career decision-making difficulties (Brown & Rector, 2008; Saka & Kelly, 2008, Di Fabio & Palazzeschi, 2009). Moreover, indecisiveness has been associated with individual characteristics such as low self-esteem (Ferrari, 1991, Germeijs & De Boeck, 2002), perfectionism (Frost & Shows, 1993; Gayton et al., 1994), emotional instability (Tokar, Fischer & Subich, 1998), anxiety (Fuqua, Newman & Seaworth, 1988, Tokar, Fischer & Subich, 1998), depression (Saunders, Peterson, Sampson & Reardon, 2000) or fear of commitment (Leong & Chervinko, 1996; Page, Bruch & Haase, 2008). Additionally, Guay et al. (2003) shown in their study that self-efficacy and autonomy toward career decision-making have a significant direct impact on career indecision, a conclusion supported by Brown & Rector (2008). Also, White and Tracey (2010) consider that self-knowledge has an important source for career decision-making process

because in their study the researchers identified a relationship between authenticity and career indecision. Based on their study result, they found that individuals who scored higher on the authenticity measure were less indecisive about their career and were less likely to lack goal orientation, while individuals with low scores on the authenticity measure developed a high level of career indecision, were anxious, had an external locus of control and experienced difficulties in their belief about their problem solving ability.

According to Bandura (1997), the judgments regarding the self-perceived capacity or self-efficacy influence the situations an individual choses to get involved into, the behaviors people choose to engage in and how much they persevere in their efforts in the face of obstacles and challenges and emotional reactions while anticipating or involving in a situation (for example: the level of stress or anxiety). Thus, self-efficacy refers to an individual's belief in his or her capacity to execute specific behaviors necessary to produce specific performance attainments and beliefs about self-efficacy influences the way of thinking, motivation, performance and individual's emotional activation (Opre & Boroș, 2006).

Career decision-making self-efficacy denotes individual's degree of confidence that he can successfully engage in tasks associated with making a career choice and commit to a career (Taylor & Betz, 1983). Individuals with a high level of career decision-making self-efficacy prefer decisions that are more challenging and complex and are more motivated to seek as much information when they are involved in the decision-making process. Since the emergence of career decision-making self-efficacy concept, a number of studies have demonstrated its importance in the study of career development. For example, several studies have found positive relationships between career decision-making self-efficacy and: vocational identity (Gushue, Scanlan, Pantzer & Clarke, 2006), career exploration (Blustein, 1989), occupational self-efficacy (Taylor & Popma, 1990), career decision-making attitudes (Luzzo, 1993), self-esteem (Robbins, 1985) and preference for growth in one's career (Gianakos, 2001). Conversely, other studies have demonstrated negative relationships between career decision-making self-efficacy and: career indecision (Lopez & Ann-Yi, 2006; Taylor & Betz, 1983; Taylor & Popma, 1990), isolation from others (Gianakos, 2001) and fear of commitment (Wolfe & Betz, 2004).

Other studies, such as those made by Betz & Hackett (1983) and Hackett et al. (1981) support the existence of gender differences regarding career decision-making self-efficacy, especially concerning the search related to following a certain professional path that has proven to be more dominant to adolescents. Mostly, male adolescents feel efficacious toward careers in science and technology whereas female adolescents feel more efficacious toward careers traditionally held by them (Bandura, 1997; Betz & Hackett, 1981). In a study realised by Marlino & Wilson (2003), they have found that while male and female adolescents have comparable levels of self- confidence, there are important differences in key areas; specifically, girls have reported lower confidence levels than boys in areas related to math, finance, decision making and problem solving, but they have significantly better results in planning and gathering information about career which they wish to follow, as Gianakos (2001) concludes in his study.

In a longitudinal study realised by Perţe (2013) using a sample of 554 high school students, in twelve grade, belonging to the following educational profile: philology, mathematics-computer programming profile, social sciences, nature science and technical profile (library tehnicians), she has identified significant differences regarding career decision-making difficulties among different educational profiles, but as a result of the decreased effect caused by a high statistical power, the author suspended acting upon these differences. Also, the same study shown significant differences concerning decision difficulties due to lack of information about the specializations followed by students. According to the results of the post-hoc tests, it was found there was a tendency in students from natural science profile showing a higher level of difficulty in comparison with the students from social science profile. However, in relation to career decision-making self-efficacy, the author did not find significant differences regarding the educational profile.

Based on research findings, the purpose of the present study is to identify whether there is a difference between participants' educational profile, career indecision and career decision-making self-efficacy.

Method

Participants

The present study is based on the participation of 121 students of "Dragoş Vodă" National College from Sighetu-Marmaţiei, Maramureş county. The total number included 57 were boys (47,1%) and 64 girls (52,9%). Their majors were: science profile (42,14%), humanities profile (27,27%) and social studies 37 (30,57%); their age ranged from 16 to 18 years (m=17, SD=0.81). All the participants were in their final high-school year of study.

Measures

The two variables investigated in this study (career indecision and career decision-making self-efficacy) were measured using the following instruments for data collection:

Vd1- career indecision was measured with Career Decision Difficulties Questionnaire CDDQ (Gati, Krausz & Osipow, 1996)

Vd2.- career decision-making self-efficacy was measured with Career Decision - Making Self-Efficacy- Short Form Scale; CDMSE-SF (Taylor & Betz, 1983).

Career Decision Difficulties Questionnaire CDDQ (Gati, Krausz & Osipow, 1996)

The questionnaire comprises 3 major components of difficulties encountered in career decision-making: lack of readiness, lack of information and inconsistent information. It consists of 34 items which are further divided into 10 subcategories plus 3 additional items; the first additional item requires the participant to specify if he/she has already made a decision regarding future career, the second additional item assesses participant's certainty that he/she has made the right decision and the third additional item, which is presented at the end of the actual questionnaire, assesses participant's perceived level of difficulty regarding future career decision process. Respondents are asked to indicate their level of agreement with these statements on a nine-point scale, ranging from 1 - "Does not describe me", to 9 - "Describes me well".

The present study is based on the application of *lack of information* and *inconsistent information* subscales. The lack of information subscale includes: lack of knowledge about the steps involved in the process of career decision-making; lack of information about self, lack of information about the various occupations and about the ways of obtaining additional information and inconsistent information includes unreliable information, internal and external conflicts.

Gati et al. (1996) reported for the Israeli population an internal consistency reliability coefficient of .95 for the entire questionnaire and .70, .93, .91 for the three categories of difficulties. For the American population, the same researchers obtained an internal consistency reliability coefficient of .95 for the total scale and .63, .95, .89 for the subscales. In general, the internal consistency coefficient have very good values, studies proving the Cronbach coefficient of over .80 (Gati, Osipow & Krausz, 1996; Osipow & Gati, 1998; Gati, Osipow, Krausz & Saka, 2000; Mau, 2001). Gati et al. (1996) reported that the test-retest reliability coefficients of the 3 major components of the career difficulties were .67, .74, .72 and .80 for the entire questionnaire for the Israeli sample.

Career Decision-Making Self-Efficacy - Short Form Scale; CDMSE-SF (Taylor & Betz, 1983)

The scale measures an individual's degree of belief that he or she can successfully complete tasks necessary to making career decisions. The scale consists of five subscales: Self-Appraisal, Occupational Information, Goal Selection, Planning and Problem Solving. Students rate their perceived effectiveness on a 5-point Likert scale (1 = *no confidence at all* to 5 = *complete confidence*).

In our research we focused on the Career Planning subscale, which assesses the level of adolescent's confidence to set long-term, medium and short-time goals regarding their professional and educational directions.

Taylor & Betz, (1983) have reported an internal consistency reliability coefficient (alpha) .83 for the subscales and .94 for the total score.

Research design

The current study had a correlational design, thus the principal purpose was to investigate the relationship between educational profile, career indecision and career decision-making self-efficacy.

Procedure

In the first stage all participants were informed about the purpose of the present investigation and about the instruments used to collect the data. To avoid any measuring error that might have been due to the data collection procedure, all participants were given a collective briefing before questionnaire completion. After this stage ever participant had individually completed the form in a paper-pencil format.

Results

Table 1. Kolmogorov-Smirnov Test for data distribution of career indecision variable

One-Sample Kolmogorov-Smirnov Test

		CDDQ_inconsistent_ information	CDDQ_lack_of_ information	CDDQ_ total
N		82	108	121
Normal Parameters[a,b]	Mean	7,2317	9,3889	15,7107
	Std. Deviation	2,61193	2,44121	5,99088
Most Extreme Differences	Absolute	,250	,414	,188
	Positive	,145	,197	,147
	Negative	-,250	-,414	-,188
Kolmogorov-Smirnov Z		2,262	4,299	2,066
Asymp. Sig. (2-tailed)		,000	,000	,000

a. Test distribution is Normal.
b. Calculated from data.

Table 2. Kolmogorov-Smirnov Test for data distribution of career decision-making self-efficacy variable

One-Sample Kolmogorov-Smirnov Test

		Self-efficacy_ Career_Planning	Self-efficacy_ total
N		80	28
Normal Parameters[a,b]	Mean	7,4250	16,7857
	Std. Deviation	3,25994	7,99239
Most Extreme	Absolute	,286	,243

		Self-efficacy_ Career_Planning	Self-efficacy_ total
Differences	Positive	,215	,152
	Negative	-,286	-,243
Kolmogorov-Smirnov Z		2,554	1,285
Asymp. Sig. (2-tailed)		,000	,073

a. Test distribution is Normal.
b. Calculated from data.

We noticed that K-S test results for measured variables are statistically insignificant: career indecision (z=2,066; p<0, 01) and career decision-making self-efficacy (z=1,285; p<0, 05); therefore the distribution of these variables did not differ from a normal distribution.

Table 3. Descriptive indicators for indecision career by gender and participants' educational profile

Case Summaries

CDDQ_Total

gender	educational_ profile	N	Mean	Median	Std. Error of Mean
Male students	science	27	16,7037	18,0000	,99688
	humanity	10	14,4000	16,0000	2,37206
	social	20	16,5000	19,0000	1,27010
	Total	57	16,2281	18,0000	,76295
Female students	science	24	15,1667	19,0000	1,29753
	humanity	23	15,7391	17,0000	1,21131
	social	17	14,7059	17,0000	1,64666
	Total	64	15,2500	17,5000	,77472
Total	science	51	15,9804	19,0000	,80610
	humanity	33	15,3333	17,0000	1,09291
	social	37	15,6757	18,0000	1,01790
	Total	121	15,7107	18,0000	,54463

Analyzing the results shown in Table 3, it can be noticed that there are significant differences regarding the career decision difficulties over the participants' educational profile. Thus, the high level of indecision is found to be among boys with a science profile (M=16,70, SD=0,99) and social studies (M=16,50; SD=1,27), while among the girls, the indecision level is high for those with a science profile M=15,16; SD=1,29) and humanities profile (M=15,73; SD=1,21).

Table 4. Descriptive indicators of career decision-making self-efficacy by gender and participants' educational profile

Case Summaries

CDMSE-SF_total

gender	educational_ profile	N	Mean	Median	Std. Error of Mean
Male students	science	6	15,8333	20,5000	4,39254
	humanity	2	16,5000	16,5000	6,50000
	social	4	15,2500	13,5000	3,03795
	Total	12	15,7500	15,5000	2,42501
Female students	science	6	12,1667	11,5000	4,02837
	humanity	6	21,3333	22,5000	1,70620
	social	4	20,0000	20,0000	2,38048
	Total	16	17,5625	22,0000	1,96420
Total	science	12	14,0000	16,5000	2,89461
	humanity	8	20,1250	22,5000	1,92203
	social	8	17,6250	16,0000	1,99944
	Total	28	16,7857	19,5000	1,51042

Regarding career decision-making self-efficacy variable, we can say that there are differences among the measured variable, participants' identity and participants' educational profile. Therefore, the boys belonging to a science profile (M=15,83; SD=4,39), and social studies (M=15,25; SD=3,03) had low level of career decision-making self-efficacy compared to girls belonging to a science profile (M=12,16; SD=4,02) and social studies (M=20, SD=2,38).

In order to test the existence of a relationship between variables, we used the Pearson correlation coefficient because the conditions of employing it were met` (both variables are quantitative and the distribution is normal).

Table 5. The correlation between decision-making self-efficacy and participants' educational profile

Correlations

		CDMSE-SF_total	Educational_profile
CDMSE-SF_total	Pearson Correlation	1	,219
	Sig. (2-tailed)		,262
	N	28	28
Educational_profile	Pearson Correlation	,219	1
	Sig. (2-tailed)	,262	
	N	28	160

After calculating the r Pearson correlation coefficient we noticed that there is a significant positive correlation between career decision-making self-efficacy and educational profile $r_{(26)}$=0,219, p<0,01 (26 represents the degrees of freedom, df=N-2, where N is the number of subjects), which means that there is a moderate association between the two variables, so the hypothesis is confirmed.

Discussion

From the perspective of the reviewed literature, there are few studies discussing the issue of differences between students' educational profile, career indecision and career decision-making self-efficacy. The results of the present study confirm the Perţe (2013) results regarding the existence of differences between educational profile, career indecision and career decision-making self-efficacy. According to the presented data, it was showed that there are significant differences between educational profile, gender and career indecision. However, the male and female students from science profile showed greater

career decision difficulties, a fact reported in the case of the male students from social studies and the female students from humanities profile. Also, the results indicate that male students from humanity profile and female students from social studies showed a lower levels of career indecision.

Regarding the second studied variable, career decision-making self-efficacy, the results had indicated the existence of differences between gender and students' educational profile, results which are in contradiction to results obtained by Perţe (2013). According to obtained results we found differences between male adolescents and female adolescents belonging to science profile and social studies, where the male participants indicated a low level of career decision-making self-efficacy. However, there did not appear to be significant differences between male and female participants from humanities profile.

To sum up, the students from science profile indicated a high level of career indecision but in the same time they showed a lower level of career decision-making self-efficacy in comparison to students from humanities profile. Regarding social studies, the study showed that male and female adolescents indicate a lower level of career decision-making self-efficacy but a high level of career indecision have identified only among male adolescents.

Limitations of the current study

One of the limitations of the study consistes in the sample of participants chosen. Adolescents included in the study were students of the same high-school, so the results may not have a high accuracy degree in generalizing the obtained results.

Another limitation of the study is the use of assessment instruments which are not validated and adapted to Romania population, so that their psychometric properties remain unchanged.

The third limitation of the study could be the reintegration in the research of exogenous variables (for example: the parents' educational level) and endogenous variables (e.g. dysfunctional beliefs, personality traits, perfectionism) which could provide a wider picture regarding career decision difficulties of the participants in this study.

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TRAINING OF THE DIDACTIC COMPETENCIES. AN EXPLORATORY STUDY

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ABSTRACT. The paradigmatic changes that have taken place in nowadays Romania both at the educational and social level determine the reorientation in teachers' initial and continuing education and a redefinition of the competencies required by the teaching profession, which generates a repositioning of the teacher as an agent of change. Moreover, the current educational requirements impose the setting of a role-model for the didactic profession, a unitary, standardised one that may be nationally acknowledged and in accordance to the European space. Hence, ensuring an educational process at quality standards is dependent on the acquisition and practice of competencies specific to the teaching job, competencies that correspond to the current psycho-pedagogical requirements and existing social needs. The extent to which the current continuing training programs contribute to the development of these competencies as well as the secondary education teachers' perception regarding the building of professional competencies within the initial training are the variables explored in the current study.

Keywords: *continuing education, initial training, competences, training programs.*

ZUSAMMENFASSUNG. Die paradigmatische Veränderungen, die heutzutage in Rumänien sowohl im Bildungs- und Sozialniveau geschehen, bestimmen eine Wiederorientierung in der Lehrer Aus- und Weiterbildung und die Neudefinition von den Kompetenzen, die nötig für den Lehrberuf sind. Das generiert eine Neupositionierung des Lehrers als Agent des Wandels. Zudem, die aktuellen bildungspolitischen Anforderungen stellen eine Einstellung eines Rollenmodell für die didaktische Beruf auf, die auf nationaler Ebene anerkannt werden kann und einheitlich, standardisiert und in Übereinstimmung mit dem europäischen Raum ist. Folglich ist die Gewährleistung des Bildungsprozess

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bei Qualitätsstandards von der Übernahme und die Praxis der Kompetenzen spezifisch für die Lehrtätigkeit abhängig, Kompetenzen, die auf die aktuellen psycho-pädagogischen Anforderungen und bestehenden sozialen Bedürfnissen entsprechen. Das Ausmaß, in dem die aktuellen Weiterbildungsprogramme zur Entwicklung dieser Kompetenzen beitragen als auch die Sekundarstufe II Lehrerwahrnehmung in Bezug auf den Bau von beruflichen Kompetenzen, innerhalb der Grundausbildung, sind die Koordinaten der aktuellen Studie.

Schlüsselwörter: *Weiterbildung, Grundausbildung, Kompetenzen, Ausbildungsprogramme.*

1. Introduction

Considering the globalization phenomenon and the dynamics of the information society it is mandatory to reevaluate a series of terms in the educational field, such as: education, educated person, learning, school, teacher/ educator, initial training, and continuing education. At the same time, the need for the development of the training level and requalification, self-learning, self-development and maximal valorisation of the abilities and intellectual potential becomes a preferred dimension of the educators and the educational decision-makers. It is expected that teachers manifest interests such as the focalization on an active and proactive continuing education, based analytical thinking, synthetizing, problem solving. (Melek, 2009).

The methodological guidelines of the current Romanian legislation state both the general coordinates which ensure the teacher training as well as the stages of evolution in a didactic career, the examinations taken in order to be granted the permanent teacher certification and 1st and 2nd teaching expertise degrees. Therefore, continuing education and initial training are conceived as interdependent processes, bearing interactions and self-regulation means that allow for a permanent adaptation of the teacher's training to the dynamics of the processes and educational systems. Both initial and continuing education are stipulated to ensure the building and development of professional competencies that correspond to the teaching profession standards.

Teaching skills are essential parts of teachers' professional development and play important roles in teachers' daily practice in classroom. Teachers use teaching skills to design, teach and organize learning activities inside and outside classrooms. The development of teaching skills requires the application of general skills to the classroom setting in a variety ways (Zhao & Jiao, 2012). Research in the field confirms the fact that professional development is accomplished by means of active participation of the teachers to the continuing education activities organised within school institutions. The literature highlights the important factors that support teachers' professional development: learning from colleagues and from everyday working practices, promoting of an emotionally safe atmosphere, the leader's personal support, the flexibility in work planning, shared lessons with colleagues, training events in an authentic work environment and colleagues' professionalism (Ryymin & Lallimo, 2010).

In a teacher training program that took place in the USA, the didactic competence is referred to as split in five specific competencies, respectively: the cognitive competence, the affective competence, the exploratory competence, performance-based competence, in which teachers prove not only that they know, but also that they can make use of what they know, and the competence to produce noticeable changes of the students as a result of the pedagogic relation. (Gliga, 2002). Philippe Perrenoud, sociologist and pedagogue, revealed within a study the existence of ten domains of priority professional competence in the continuing education of teachers and educators, with the elaboration of specific competencies for each reference competence: organisation and vitalisation of learning situations, management of school evolution, design and improvement of differentiation instruments, involvement of students in learning and practice, team work, school management participation, informing and involvement of parents, use of new technologies, involvement in the tasks and ethical dilemmas of the job, personal management of continuing education. (Perrenoud, 2004).

The need to access continuing education programs by teachers is indicated by the results of studies such as Effective Use of Instructional Materials and Technologies in Teacher Training: Expectations and Opinions of Teacher Candidates, which shows that: "The majority of teachers cannot combine their own teaching methodologies with information and communication technologies. It can be

said that the most important reasons for not using education technologies/materials in lectures effectively are respectively lack of knowledge about adapting technology to the course, lack of equipment and lack of time" (Cengizan, 2011).

2. Major research coordinates

Our research was based on the following questions:

1. What is the perception of teachers in the Romanian school education over the professional competencies necessary to teachers?

2. What is the extent to which the system of professional competencies for the teaching career is developed at the level of the Romanian initial teacher training programmes?

3. To what extent do continuing teacher training programs contribute to the development of professional competencies needed by a teacher?

We mention that a professional competence for teaching represents the sum of cognitive, affective, motivational capacities, which together with personality traits provide the teacher with the qualities necessary to carry out the didactic activity that satisfies the aimed objectives and bears very good results (Gliga, 2002). The investigation method we used was the questionnaire-based survey. Therefore, the intention was to use an opinion survey in order to investigate the teachers' perception in school education regarding the professional competencies that are necessary to an effective teacher, the level at which this can be accomplished throughout initial training as well as the extent to which continuing education programs contribute to the development of these competencies. The questionnaire consisted of eight items with multiple choice questions, items regarding the types of competencies necessary to a teacher, professional competencies that characterise an effective teacher, professional development levels that are based on the content and curriculum of continuing education programs. The sample consisted in 96 teachers in the rural and urban area. The obtained results were statistically processed, and they presented in a table format below.

3. Presentation and interpretation of the results

The first item of the survey referred to the type of competence that a teacher must possess.

Table 1. The prevalence of the main competencies a teacher must possess

Response types	Number of responses	%
Psychopedagogical competence	42	43,75%
Cross-sectional competence	11	11,46%
Competence in the field of practice	18	18,75%
Psychosocial and managerial competence	25	26,05%

An analysis of the data presented in Table 1 shows that the psychopedagogical competence is indicated by 43,75%, of the respondents, as the competence necessary to be held by a teacher. This option can be explained as illustrative for the awareness of practising the competence of knowing the students and considering their age and individual particularities in the design and completion of instructive-educative activities, the capacity to prepare students for self-learning and self-education. The psychosocial and managerial competence is considered by nearly one quarter of respondents, 26,05%, as a second most important competence that a teacher requires. We appreciate this option as a thoroughly justified one due to the need of taking responsibility of the organising, orientation, coordination and guiding of the group of students, self-motivation in decision-making situations for teachers. Though considered as the most relevant competence by a significant number of respondents (a proportion of 18,75%), the competence in the field of practice occupies the third place within our list of competencies. Stemming from the premise that a teacher must know and make excellent use of the information in the field he/she teaches, we gather why this competence reached such a positioning. The final ranking the transversal competencies have got, according to the opinions of 11,46% of the respondents, can be traced in the fact that we still lack the human resource in the teaching staff

that can firmly hold the practice of animating a group, of effectively carrying out team-work, of adapting promptly to new situations, capable of innovating, creating and taking decision in various cases.

The second item of the survey completes the previous one by elaborating on the specific competencies of an effective teacher. The results are shown in Table 2:

Table 2. Necessary competencies of an effective teacher

Response types	Number of responses	%
Clearly sets the objectives that students must accomplish	15	15,63%
Identifies and designs learning opportunities that are relevant for the students' daily life contexts	20	20,83%
Shows intent to adapt to students' diversity	18	18,75%
Creates and keeps the class in an environment that supports learning and learning motivation	11	11,46%
Encourages social interaction of students	12	12,5%
Gives students challenging work tasks meant to stimulate their intellectual development	10	10,42%
Permanently monitors the students' progress	10	10,42%

The interpretation of the registered scores at the level of each of the six competencies that build the pattern of an effective educator allows us to appreciate that the differences among them are small, which indicates a polarisation of the respondents' opinions. The fact that the identification and design of learning opportunities that are relevant for students' daily life is voted by an important part of respondents, 20,83%, as the most relevant competence defining an effective teacher enables us to estimate the positive effects of the reform in education, respectively to emphasise the paradigmatic feature of learning, by means of connecting theory to the practical aspects. Only two percentage points below, at a slight difference, is positioned the competence that marks an educator's concern in adapting to students' diversity. The

option chosen by 18,75% of the respondents can be explained in the same context of contemporary pedagogy, where the student-centred approach of the didactic process is a priority. The third positioning of the competence "clearly sets the objectives that students must accomplish" is nominated by 15,63% of the interviewed subjects. We appreciate this option as an objective one, in the context in which the success of any didactic endeavour is highly dependent on its projection, a process that starts with the clear and correct setting of the aimed objectives. The fact that the last four positions are occupied by competencies that register very close scores with differences of only two, one or no perceptual points allows us to estimate that an effective teacher is defined through a wide spectrum of competencies, their importance and positioning being nearly equal.

Table 3 renders the scores obtained in item number three, which was designed so as to indicate the extent in which initial training programs are appreciated by our respondents as beneficial to the acquisition of professional abilities.

Table 3. The extent in which initial training programs contribute to the building of professional competencies

Item/Answer	Very much	A lot	Little	Very little	Not at all	Total
To what extent has the continuing teacher training programs contributed to the development of your professional competencies?	22 22,92%	43 44,8%	16 16,67%	14 14,58%	1 1,04%	96 100%

The analysis of results indicates that initial training programs are appreciated by 44,8% of respondents as highly responsible for the building of professional didactic competencies. Their formative effect is confirmed by the fact that 22,92% of the respondents answered that such programs greatly contributes to the total of their professional abilities. In comparison to the

number of those who claim that initial training contributed little (16,67%) and very little (14,58%) to the development of professional skills, the number of those who stated that such training was irrelevant was very little (1,04%). Nonetheless, it can be read as an alarming signal that nearly 30% of respondents mention that initial training is insufficient in the construction of professional competencies. Hence, we consider the higher attention must be paid to curriculum and the means of implementing it at the level of initial training, in such a way that the majority of necessary qualifications for a teacher may be covered at a higher level.

Item 4 completes the third item in the sense of identifying the extent in which current training programs fulfil the needs of the teachers to improve and develop.

Table 4. Extent to which continuing education programs have satisfied the trainees' needs of development

Item/Answer	Greatly	A lot	Little	Very little	Not at all	Total
To what extent have continuing education programs satisfied your needs of development?	21 21,88%	33 34,38%	14 14,58%	16 16,67%	12 12,5%	96 100%

As indicated in Table 4 the prevalence of those who declare themselves satisfied (34,38%) and highly satisfied (21,88%) by the manner in which continuing education programs met their needs for development is equal to those on the opposite side, namely: 14,58% are little satisfied, 16,67% very little satisfied, while 12,5% considered initial training useless in the development of their competencies. Based on the results we obtained, we may indicate an increase in the interest of ensuring the correspondence between the needs for training and the programs accessed by trainees, as well as in view of correlating training programs' contents to those elements that are mandatory in the design of didactic and field-related professional competencies.

Table 5. The levels at which continuing education programs produced positive effects

Response types	Number of responses	%
Gaining new knowledge, specialty-related information	22	22,92%
Practising the exploratory competence –by creating opportunities that requires the practice of didactic abilities	11	11,46%
Acquiring inter-relational competencies regarding the teacher-student relation	25	26,05%
Development of assertive communicative competencies	14	14,58%
Development of intellectual abilities that are focused on identifying/ indicating stringent educational issues	16	16,67%
Development of reflexive and pragmatic attitudes	8	8,34%

We can infer from the analysis of the data presented in Table 5 that "the acquisition of inter-relational competencies regarding the teacher-student relation" is considered by 26,05% of the participants to be the dimension that registered positive changes as a result of completing continuing education modules, which is rejoicing. The response option "Development of assertive communicative competencies" was selected by 14,58% of the teachers who answered. They considered it to be the direct benefit of the completed training program. The combined data of these two items enable us to allege that the programs were highly relevant from the perspective on intercommunicative effectiveness. Another aspect that was considered to be well shaped as a result of completing the continuing education modules was represented by the „gaining of new knowledge, specialty-related information", answer option selected by 22,92% of respondents. This allows us to mention that the continuing education programs within the curriculum contain new elements, up-to-the-minute information with focus on the trainees' specialty. The component „development of intellectual abilities that are focused on identifying/ indicating stringent educational issues" is believed to be reached by 16,67% of respondents, which indicates the concern of both trainers and trainees to develop research competencies applicable in the identification of problems and solutions in the field of the education. Less rejoicing, however, is the fact

that the „development of reflexive and pragmatic attitudes" is chosen by only 8,34% of respondent claiming that the continuing education modules they completed had the above-mentioned direct benefit. We reckon that this component deserves to be approached with more attention within the content and the curriculum of training modules, as we are in need of pragmatic teachers, who are involved in the issues of socio-education and determined to identify valid solutions for any problem.

Item 6 could provide relevant information about the extent to which some means of organising continuing education were represented according to their degree of effectiveness. The results are presented in Table 6.

Table 6. The extent to which the means of organising continuing education are considered to be effective

Response types	Number of responses	%
Methodical commissions, teacher circles at the level of the school unit	25	26,05%
Training modules ensured by CCD	19	19,8 %
Training modules organised by higher education	21	21,88%
Training programs accessed through POSDRU	27	28,13%
Training programs completed through international organisations	4	4,17%

According to the data in the table above, the preferred option referred to is „training programs accessed through POSDRU" (28,13% of respondents). This can be explained based on the advantages, including the material ones that participation in such programs brings. A close score, 26,05%, is given to training and development activities conducted within the school unit (applied didactics commissions, teacher circles at the level of the school unit). Our opinion, with respect to these results, is that learning is produced with even greater ease by sharing personal experience as a result of sharing the same socio-educational environment. Both the programs offered by higher education, 21,88%, and those ensured by The Teacher Training House, 19,8%, register close scores from the point of view of effectiveness, which can be explained

regarding the similar offer of the two suppliers of continuing education. A small score of 4,17% was assigned to „Training programs completed through international organisations", which accounts for the scarce participation of teachers to such a type of continuing education, mainly due to insufficient promotion or difficult access to these programs.

4. Conclusions

As a result of our investigation we believe that new directive actions should be taken in the field of teacher training, that are meant to lead to the development of professional competencies in accordance to the model of didactic competencies desired didactic model in nowadays society. We refer to:

- Orientation of initial and continuing education programs towards the development of transversal competencies that may be organized in: group animation competencies, effective team-work, flexibility and quick adaptation to novelty, capacity to innovate, create and decide in various situations;
- Strengthening of the pragmatic feature of learning and focusing on specific services that can be applied to each individual (personal and professional development);
- Growing interest in ensuring a link between the needs for training and the programs that trainees access, with an emphasis on curriculum flexibility in view of matching the content of training programs to those elements that are necessary in the building of competencies according to the didactic profession (e.g. development of reflexive and pragmatic attitudes, the competence of inducing visible changes at the students' level as a result of the pedagogic relation).

Considering that "didactic competencies represent essential landmarks in developing initial and continuing training programs" (Glava, C., 2009, p.73) we estimate that the concern of providers of study and training programs for teachers in primary and pre-school education will be anchored in the identification of the training needs and ensuring the development of professional competencies at high quality standards. Given that there is interrelation between the quality of education and the quality of the teaching staff, it is mandatory to provide continuing education on the basis of standards that are strict, unique commonly adopted and correlated to the standards available in other countries.

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RESEARCH-LED HIGHER EDUCATION AND 'THE BIGGER PICTURE'

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ABSTRACT. There is increasing pressure on higher education institutions to be research-driven and consequently populated by individuals whose main strength is research. It has already been established that the skills necessary to make a good researcher are not the same with those that make a good teacher. There are, however, other implications with respect to how teaching content is structured in terms of breadth and depth, and how breadth and depth of knowledge in turn may affect students' knowledge in their field – but also broader world views. The aim of this paper is to examine how conflict may arise from the concurrent pursuit of these goals. This discussion is based within the context of split-brain theory (breadth being a right hemisphere attribute, and depth added primarily by the left hemisphere), and highlights the potential of this theory in enhancing the higher education experience.

Keywords: *breadth of research interests, higher education, split brain theory, world view.*

ZUSAMMENFASSUNG. Der Druck auf die Hochschulen forschungsorientiert und somit von Personen getragen zu sein, deren Hauptstärke die Forschung ist, steigt. Es wurde bereits festgestellt, dass die Fähigkeiten, die erforderlich sind, um ein guter Forscher zu sein nicht die gleichen sind, wie die, ein guter Lehrer zu sein. Es gibt aber auch Auswirkungen bezüglich der Breite und Tiefe der Lehrinhalte und darauf, wie die Breite und Tiefe des Wissens sowohl das Wissen der Schüler in ihrem Bereich, als auch die weitere Weltanschauungen beeinflussen. Diese Abhandlung untersucht, wie sich Konflikte aus der gleichzeitigen Verfolgung dieser Ziele ergeben können. Die Diskussion basiert auf der Split-Brain-Theorie (Breite als ein Attribut der rechten Gehirnhälfte

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und Tiefe wird in erster Linie von der linken Gehirnhälfte beeinflusst), und weist auf das Potential dieser Theorie hin, zur Verbesserung der Erfahrung an Hochschulen beizutragen.

Schlüsselwörter: *Breite der Forschungsinteressen, Hochschulbildung, Split-Brain-Theorie, Weltanschauung.*

Introduction

It appears the 'right brain-left brain' theory popular in the mid-twentieth century (Harrington, 1987), was not entirely wrong. The two hemispheres of the human brain do indeed serve different functions, although not those initially attributed to them. The left hemisphere is not so much about rational thinking, as it is about adding detail to things that are already known. The right hemisphere is not so much about emotion, but about the bigger picture and staying open to the unexpected. Today we live in a left-brain world (McGilchrist, 2009; 2012). An understanding of brain lateralization is highly relevant to education (Yarlott, 1986). Recent studies have, for example, applied this theory in performance appraisal training (Selden, Sherrier & Wooters, 2012), or in characterizing learning styles (Kelly, 2013).

Even more importantly though, the distinction between narrow and broad focus, as dictated by the two brain hemispheres, is not without relevance to higher education. Having research at the core of academic activities at universities is tremendously important to what and how students get taught. On the one hand, research has become increasingly specialized (Belmaker, Cooper, Lee & Wilman, 2010), and research specialization is precisely what provides academics with an identity (Chalmers, 2011). Interdisciplinary approaches are often viewed as a lack of focus by academics and research funding bodies alike. Fields of research act in a very much left-brain manner, by simply adding details to already crystalized cores of knowledge. Where interdisciplinarity is encouraged, this is often in a focused sort of way, which soon results in the addition of new cores of knowledge – but not necessarily in keeping disciplines connected in the long run (Rafols, Leydesdorff, O'Hare, Nightingale & Stirling, 2012).

On the other hand, university teaching should ideally first ensure that the students get the bigger picture of whatever they are studying, and only then start adding detail (Malamud, 2010), unless there is an implicit assumption that students bring along that bigger picture from home or from school level. This separation between a 'breadth phase' and a 'depth phase' resulted in the initial distinction between undergraduate and postgraduate studies, but the differences between these two stages have become more complex (Lindsay, Breen & Jenkins, 2002; Malamud, 2010).

Teaching and research require different attributes and thus imply different personality traits (Eble, 1976). The researcher is very often an introvert who prefers to stay focused on idea generation, as opposed to the teacher who is more social and able to have multiple focuses and enjoys spending time with students (Nehme, 2012). Indeed, in their meta-analysis of studies on this topic, Hattie and Marsh (1996) found no support for a beneficial link between research and teaching. While much may have changed since in the functioning of universities, this has apparently not. For example, Pan, Cotton and Murray (2014) found that academics still experienced difficulty maintaining a balance between the various demands pertaining to research and teaching.

Academic staff primarily prepared for research – especially those with postdoctoral experience (Rybarczyk, Lerea, Lund, Whittington & Dykstra, 2011) – are often thrown in at the deep end of a poorly prepared teaching career (Quinn, 2003). Many have already figured for themselves in their research-only days that dwelling on the bigger picture is unlikely to take them too far. Some may even perceive teaching as diluting their specialist, research-driven identity (Chalmers, 2011). In this context, they often fail to attain the 'teacher' status as defined by McMillan (2007) – implying that they do not assume the role of shaping students in the field, but remain at the 'lecturer' status, merely imparting knowledge.

Furthermore, the double-duty of teaching and research is not perceived by academics as an ideal situation. Pan et al. (2014) indicated a tension between teaching which is often viewed as more of a professional obligation, and research which is more related to academic desirability and career advancement. Gibbs (2013) also noted the increasing demands of performance-based research and the 'publish-or-perish' maxim, which according to her is not

an effective means of motivating academics to write. At a glance, this situation seems to be a perfect recipe for schizophrenic academics and poorly prepared students. Of course, things vary across countries, institutions, and fields of knowledge.

This paper emerged out of reflection on practice, and followed the approach of Boyd, O'Reilly, Rendell, Rowe and Wilson (2012) in drawing on reflection-in-action and reflection-on-action, as advocated by Schon (1987). Both authors of this paper are based in a tertiary education institution, but with very different backgrounds – thus allowing for a broader overview of academic endeavors. One is a natural scientist primarily teaching undergraduate students, while the other is a social scientist teaching solely postgraduate students. The researchers have lived and experienced the multiple realities that academics face – teaching and research being the main objectives of a higher education institution. The paper was therefore conceptualized out of this background of a lived reality of the teaching-research nexus. The paper integrates key references from the fields of higher education, teaching and learning, scientometrics and psychology, in order to critically inform the research questions that were set.

These questions were: (1) how do current research structures support or inhibit research breadth?; (2) how does this impact on researchers' teaching skills and approach?; and (3) how can split-brain theory be used to understand the research-teaching nexus?

The nexus in a historical perspective

The research-teaching nexus started with von Humboldt's ideas (Elsen, Visser-Wijnveen, van der Rijst & van Driel, 2009) and von Humboldt was *the* encyclopedic spirit by definition. This, according to Visser-Wijnveen, van Driel, van der Risjt, Verloop and Visser (2009), entailed a university being about harmony between research and teaching. Looking even further back, higher learning was largely encyclopedic and furthermore holistic – being driven by worldview approaches (Osakwe, Keavey, Uzoka, Fedoruk & Osuji, 2015). This was the case across the world, from Indian gurukulas and Buddhist schools to medieval European institutions, with teaching being centered on sometimes

religious but often purely philosophical paradigms, and subsequently refined top-down (Perkin, 2006). From a split-brain perspective (McGilchrist, 2009), those were the days when the right and left hemispheres were running the world in good balance.

The modern shift in the philosophy of education, from promoting breadth to focusing on depth of knowledge, originated in 19th Century US (Florer, 1968) – yet it is the US that still promotes, in some cases, a balance of the two (Nightingale & Scott, 2007). However, most present-day academics would probably view von Humboldt's ideas as being too idealistic in the present setting of massification (Anala & Makinen, 2011). The loss in breadth has been associated with the contemporary university curriculum becoming more and more applied (Boyd et al., 2012).

The contemporary literature on the research-teaching nexus distinguishes between research-led, research-informed, research-tutored and research-oriented teaching, and indicates how each one can make universities a better place (Elsen et al., 2009). Willcoxson et al. (2011: 2) define research-informed teaching as involving the subject matter being crafted on discipline-based research. Research-led refers to how the "curriculum is structured around teaching current subject content" (Willcoxson, Manning, Johnston & Gething, 2011, p. 2). Research-oriented is where the "curriculum emphasizes processes of knowledge construction in the subject" (Willcoxson et al., 2011, p. 2). Finally, research-tutored is where the "curriculum emphasizes learning focused on students writing and discussing essays and papers" (Willcoxson et al., 2011, p. 2). While one can prepare teaching according to one of these recipes, the specific class dynamics may be critical when it comes to how exactly research and teaching are put together (Horta, Dautel & Veloso, 2012).

Boyd et al. (2012, p. 12) also argue that the "professional cultural apprenticeship may be the crucial personal epistemological and ontological impediment to engaging the nexus" – as opposed to only constraints within the organization. This means that the coexistence of research and teaching can be viewed as problematic not only at an institutional level, but also at a personal identification level (Chalmers, 2011; Gough, 2014). Essentially, it may be down to the coordinators of research-education programs to consider how to prepare materials that facilitate the research-teaching connection (MacDougall, 2012).

Research structures and the breadth of researchers' interests

Breadth and depth are the two key dimensions when measuring specialization in higher education (Malamud, 2010) – specialists being characterized by limited breadth and substantial depth, while more encyclopedic spirits show the opposite pattern. Knowledge accumulation is either driven by a pure desire for knowledge, in which case breadth or even completeness would be ideal, or by more practical purposes, in which case there are areas of immediate interest, and depth takes precedence at the expense of breadth (Crow & Tucker, 2001). The latter approach is viewed as critical for justifying research, and while universities were initially bastions of 'pure' research they are increasingly switching to 'applied' research (Calvert, 2004).

The needs of society change in a very dynamic fashion. However, once a field has been identified as critical, research funding allocated to it can result in the building of research capacity which then needs to justify its continued existence (e.g. Young, 2015). While the importance of measuring research impact can hardly be denied, the development of such measures has also provided fields of research with a means of self-justification (Brown & Duguid, 2001).

Although evidence of practical applications is taken into consideration when dividing the research funding pie at international, national or institutional level, citation-based impact measures for journals and individual researchers (Ball, 2005; Zoller, Zimmerling & Boutellier, 2014) are increasingly viewed as key – generally without looking in detail at self-citations and within-field citations. This means that, at least in certain cases, research can now be viewed as high-impact, simply because it cites itself. Within-group citation is particularly relevant here, as it creates boundaries around certain research groups and research fields (see Newman, 2001). Citations within such a field further increase the field's credibility, whereas collaboration with other fields, institutions, groups and authors (especially if these do not self-cite) has been shown to actually decrease research impact (Jones, Wuchty & Uzzi, 2008). This can explain why the percentage of all research represented by interdisciplinary projects is actually decreasing, although interdisciplinary studies, as an absolute number, are on the increase (Bhupatiraju, Nomaler, Triulzi & Verspagen, 2012). Essentially, this means that the use of citation measures can result in suppressing

interdisciplinary research (Rafols et al., 2012). In some cases, not only is the link between disciplines suppressed, but the existence of entire disciplines becomes endangered – with tragic effects on tertiary education programs (e.g. Arlinghaus, 2014).

Undergraduate versus postgraduate teaching

From the above, it can be gleaned that teaching by specialized researchers suffers from the rejection of concepts originating in other disciplines, referred to as the "Not-Invented-Here" syndrome (Kathoefer & Leker, 2012). There is, however, a lack of studies addressing this question directly, and so refining this finding requires looking into studies that are somewhat different in focus.

Importantly, Jawitz (2007) found that new academics are shaped by two distinct communities of practice in higher education. The first is the research community of practice which is focused on research and providing teaching to postgraduate students, and is composed of senior academics. The second group, the undergraduate community of practice, comprises junior and some middle-level staff who are responsible for delivering undergraduate-level teaching (Jawitz, 2007). This divide affects new staff seeking to develop a research profile and this may align their research interests with prevailing research niches, whereas new academics who may have a different interest from the dominant area are likely to be left on the periphery. This results in a narrow area of specialization for the entire teaching complement, which places students at a disadvantage. Indeed, a diversity of expertise, skills and experience of academics in a department or discipline, should provide learners with a valuable learning experience (Pan et al., 2014).

Whether an academic teaches undergraduate or postgraduate students, also dramatically shapes their career. Horta et al. (2012) alert us to the differences in teaching undergraduate and graduate students – with graduate students being able to specifically contribute to the publication of refereed journal articles.

Lecturer and student perceptions of the research-teaching nexus

Studies on how research and teaching fit in together in higher education institutions, tend to focus on positive aspects. Quinn (2003), for example, emphasizes the relationship between research and teaching by arguing that lecturers should be informed of the comprehension and advancement of knowledge in their disciplines, in order to facilitate learning. Engaging in research can ensure that academics stay abreast of recent findings – which entails more than just following a textbook (Pan et al., 2014). This is echoed by Visser-Wijnveen et al. (2009) in noting how important it is to understand how academics perceive research and teaching, particularly by way of their beliefs and how they perceive knowledge.

Very few articles refer to any negative aspects resulting from putting research and teaching together. Visser-Wijnveen, van Driel, van der Risjt, Visser and Verloop (2012) found that students valued having a teacher who was conducting actual research, and also the way in which this affected their understanding of research. Lindsay et al. (2002) found that the engagement of lecturers in research made them appear more reliable and eager in the eyes of both postgraduate and undergraduate students.

Students who took part in the research of Healey, Jordan, Pell and Short (2010) indicated several less-than-ideal views about their lecturers being involved in research – but the most commonly reported among these was the perception that these two activities compete for their lecturers' time. Stappenbelt (2013) also noted the constraints of time and resources which are required for teaching and research. More relevant here, and also frequently cited in that study, was a lack of interest in teaching on the lecturers' side; even more relevant, but seldom noted, was the fact that lecturers' "… research interests distort […] the content of what they teach" (Healey et al., 2010, p. 242). However, how exactly this distortion happened, was not further dissected.

Buckley (2011) suggested that students and lecturers have different perceptions of how teaching and research fit together, but that they also have much in common. Robertson (2007) on the other hand, pointed out that, insofar as teaching and research success can be measured, the two are not really related. The same work moves across to apparently different matters and highlights the difficulty of bringing into teaching the kind of critical thinking needed in

research, and concedes that "… it may be possible for (some) students to graduate from higher education study with little awareness of the contested and constructed nature of knowledge", and that there may be "… a dissonance between the rhetorical objectives of the (liberal) university and the reality of belief and practice at a local, disciplinary level" (Robertson, 2007, p. 552). This would be alarming, considering that higher education is becoming increasingly complex – with employers expecting graduates to have transdisciplinarity and problem-solving skills (O'Brien, 2002).

Robertson's (2007) alarm bell thus provides a link between breadth of knowledge within one's own field of study and one's overall worldview. O'Brien (2002) challenges all those in the higher education domain to become aware of how they view knowledge and knowing – but also how students see it and how this be reconciled. This primarily places emphasis on academics becoming more student-centered, but also more aware of the breadth-depth balance when designing curricula. Quinn (2003) notes that lecturers have to first critically engage their own beliefs about the epistemological and ontological nature of their disciplines, before considering how to present students with the discipline. This call clearly resonates better with depth than with breadth, as applicable to both teaching and research.

Back to the split brain

The impact of the search for research excellence on the functioning of universities has already been decried (Martin, 2011). But what about the graduates produced in the process, who are expected to function as the educated tier of entire societies? Can the present-day (already left-brain-driven society) truly benefit from the coexistence of teaching and research in universities, or is the teaching-research nexus just a fashionable phrase trying to justify a *posteriori* these institutions' current structure? A vast literature focused on the positives of the nexus points to the former (e.g. Elsen et al., 2009; Visser-Wijnveen et al., 2009; 2012; Gilmore, Lewis, Maher, Feldon & Timmermann, 2015). However, analyses of university management discourse (Mayson & Schapper, 2012; Geschwind & Broström, 2015) more likely support the latter. A solution may have to be sought in a clearer division of duties between different academic paths – assisted by informed career counselling (e.g. Jepsen, Varhegyi & Edwards, 2012).

This paper started with a reminder of the lateralization of brain function. Although most of what followed was focused on education science, it is probably appropriate to revert to the paper's neuropsychological beginnings. The understanding of hemispheric function is undergoing rapid and most exciting progress (Hervé, Zago, Petit, Mazoyer & Tzourio-Mazoyer, 2013). In an applied perspective, there is a promise that split-brain theory, at individual level, can be highly relevant to defining one's career path (Morton, 2003; Morton, Svard & Jensen, 2014), and also applicable in an educational context (Gülpınar, 2005). There is certainly great potential for this type of research to influence the structure and functioning of academic institutions and the worldviews of graduates, insofar as the willingness to apply such research can be found within them. Beyond indicating academics' likelihood to succeed better in teaching or research, an understanding of individual strengths can be viewed in a multidimensional context, avoiding simplistic dualist approaches (Macfarlane, 2015). A first step beyond the dual approach followed here could be an application of split-brain theory to the four-way scholarship of discovery, integration, application and teaching (Boyer, 1990).

Conclusion

The way in which teaching and research, as well as the nexus, can be viewed in a split-brain perspective, is summarized in Figure 1, emanating from this study.

In brief, the globally prevalent academic setup seems to be favoring those academics who are highly specialized in their research and convey their knowledge and skills at postgraduate level. The more encyclopedic spirits make good lecturers at the undergraduate level, but their research career may face numerous difficulties. This minor and insufficiently recognized separation within disciplines is, however, dwarfed by the division between academic disciplines as promoted by research specialization. This is likely to have serious implications for both individuals and society. From tertiary education, lack of cohesion is likely spreading into the realm of the personal worldview, and holistic thinking is relegated to the realms of religion and philosophy. In universities, this is left to those who study these fields – a dwindling cluster. In a societal multicultural context, world views often become in-group only topics, dividing rather than uniting society.

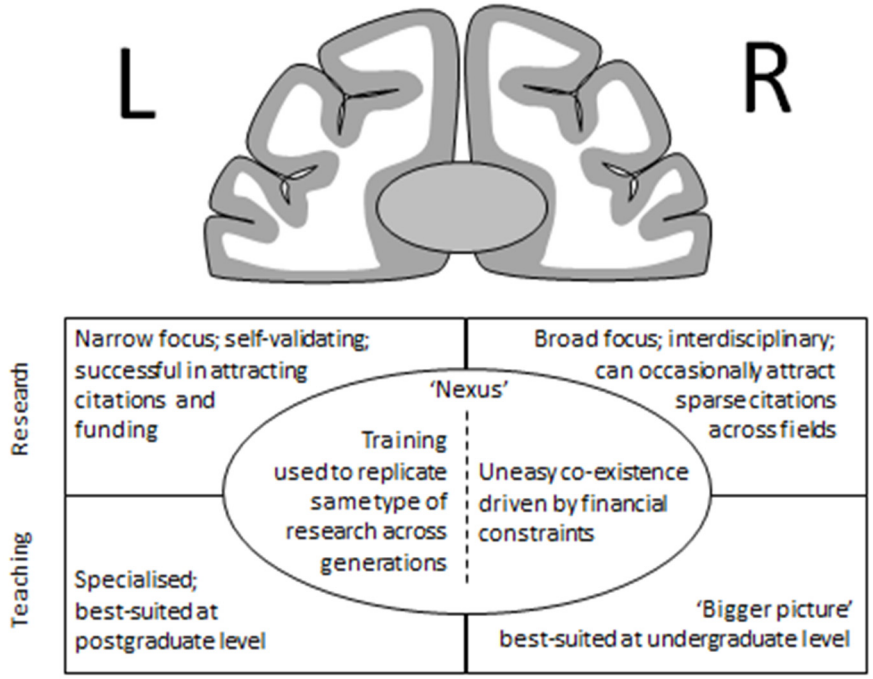

Figure 1. The teaching-research nexus from a split-brain perspective (compiled in this study)

Recommendations

In revisiting this paper's research questions, the following preliminary recommendations can be made (while keeping in mind the limitations of the study):

- An increased recognition of research breadth as a means of promoting interdisciplinarity in research. This can be achieved by new metrics measuring the spread of citations across disciplines (see Schiebel, 2015).

- Incorporating a psychology- and sociology-informed understanding of the research-teaching nexus in decisions regarding the content of undergraduate and postgraduate curricula. Allowing for flexibility in academic job profiles –

contrary to the one-size-fits-all approach which is becoming increasingly prevalent. Academics should be encouraged to achieve excellence in any one or several of the recognized academic duties (undergraduate teaching, postgraduate teaching, research, community outreach and/or administration), without forcing all of these duties on all academic staff (cf. Karagiannis, 2009). One useful theoretical tool towards understanding this need is the the expansive–restrictive workplace learning environment continuum (Boyd, Smith & Beyaztaş, 2015).

- An approach to academic career pathing that combines knowledge of brain lateralization (Szirony, Pearson, Burgin, Murray & Elrod, 2007), assessment and development of research and teaching competencies, and an understanding of both research-related and teaching-related organizational cultures (Macfarlane & Hughes, 2009).

Most of these recommendations are backed up by very little research at present, and would require novel approaches and sustained efforts prior to any attempt at implementation. It is probably only the last of the points listed above, that is already backed by some research momentum. Even here though, the brain lateralization and organizational culture aspects are understudied, and only the development of teaching and research competencies is receiving substantial attention (Hemmings, 2015; Hemmings & Kay, 2015; Požarnik & Lavrič, 2015), with some implementation underway (Heinrich, 2013; Ginns, Kitay & Prosser, 2015). These measures do however still require fine-tuning as regards the teaching-related issues specifically arising in a research-dominated context.

Limitations

This brief enquiry was intended more as an appetizer for further questions, rather than as a fully formed set of answers. The self-validating nature of today's dominant left-brain institutions means that the findings could only be limited, and that searching for them has been somewhat frustrating. The authors do, however, feel that this paper has make a few useful connections between concerns that had been previously raised only separately.

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TEACHING VALENCES OF MOODLE E-LEARNING PLATFORM

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Summary. The paper presents our experience of using Moodle e-learning platform to create a curricular auxiliary for one of economic subjects taught at school. We wanted to emphasize not only the facilities of Moodle e-learning platform through resources and activities, and to identify the educational purpose for which they can be used. On the other hand, we were interested in the opinion of students to use Moodle as the learning management system. The results of the exploratory research that we made during the school year 2014-2015 are presented as a case study, which highlights many aspects of blended learning and teaching using Moodle in the classroom.

Keywords: *blended learning, Moodle, e-learning, learning management system, virtual classroom*

Zusammenfassung: Diese Arbeit beschreibt unsere Erfahrungen mit der e-learning Plattform Moodle in der Erstellung von Lehrmaterial für ein, an einem Gymnasium unterichteten Wirtschaftsfach. Ziel der Arbeit ist nicht nur die Funktionen von Moodle in der Erarbeitung von Lehrmaterial hervorzuheben, sondern auch die Identifizierung der didaktischen Ziele im Einsatz dieser Lehrmaterialien. Ein weiterer Bestandteil unserer Untersuchungen war ein Feedback seitens der Schüler, die diese Plattform als unterichtsbegleitendes System benutzt haben. Die Ergebnisse dieser Untersuchungen wurden als Fallstudie dargestellt und beinhalten Daten aus dem Schuljahr 2014-2015. Diese Fallstudie beschreibt verschiedene Aspekte, die im Zusammenhang mit der Benutzung von Moodle im Schuluntericht stehen.

Schlüsselwörter: *blended learning, Moodle, e-learning, Lernmanagement System,virtuelle Unterichtsklasse*

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I. Introduction

Computer Training represented for contemporary school a new challenge, thanks to the advent of virtualization phenomenon of education. Its upward trend is due to the combined action of several factors such as the unprecedented growth of knowledge, the increasing need for training and facilities offered by new information and communication technologies. Virtualization is, by definition, the replacement of components or aspects of real life made by means of information, particularly computer [Cucoş, 2006].

The virtualization of education that takes place in contemporary school (and who Romanian school is no exception), is a consequence of the complex process of globalization. This is an objective and irreversible process; not much has changed in essence, but it has added new dimensions, including social and cultural dimensions. "Globalization with a human face" is a phenomenon that takes into account the interests of all individuals, boosting economic growth, disseminates advanced technology and determines a higher standard of living [Postelnicu & Postelnicu, 2000]. Known as one of the most controversial phenomena of the modern world, globalization has influenced the specific strategies and education achievement. The relationship between globalization and education is two-dimensional. On the one hand, globalization is reflected in the trend of convergence of educational models and the realization of a match (even partial) between national education systems of several countries. On the other hand, education is a vector and a result of globalization expressed by international assessments of national education systems (see PISA tests) and movements of pedagogical theories all over the world [Cucoş, 2006].

Direct consequence of the virtualization of education is changing the methods used for teaching, learning and assessment, which is now directed towards empowering the individual student learning through collaboration and co-generation depth and content to be learned by students [Cucoş, 2006].

Unfortunately, in the Romanian scientific literature are only several papers about the subject, the most part of them are descriptive than applicative [Brut, 2006], [Adăscăliţei, 2007].

In this framework is encompassed our approach to use Moodle e-learning platform (and therefore computer) in teaching classroom by creating a curricular auxiliary for one of economic subjects taught at school. On the

other hand, because the relationship between teacher and student is computer-(inter)mediated forced us to use for teaching, learning and assessment some methods and models of Blended Learning.

II. Using Moodle e-learning platform

Moodle e-learning platform was launched in Australia in 2002 and is available in over 70 languages, including Romanian. The name comes from the abbreviation are suggestive terms in English: Modular Object-Oriented Dynamic Learning Environment (MOODLE).

Located today in version 2.9.2+, Moodle can fall into several categories:

- Open Source Program, which can be used free of charge without users pay any fee for license;
- Learning Management System (L.M.S.);
- Virtual Learning Environment (V.L.E.);
- Content management system (C.M.S.).

Using Moodle has some advantages and disadvantages which we present below[3]:

a. Advantages:

- Posting lessons, themes and references that are accessible to all students;
- Assessment and respect, self knowledge through tests, games, etc;
- Creating virtual classrooms (within a school and between schools);
- Communication between users (teachers, students, visitors, administrator);
- Organizing competitions on various topics;
- Development of projects of various kinds between schools;
- Check the originality projects loaded.

b. Disadvantages:

- Informational harassment for students;
- Social isolation, similar as in social networks;
- The time required for the creation and implementation of the course.

These disadvantages are diminished considerably by following aspects:

[3] ***- "Developer of e-learning course on Moodle", eLearning &Software S.R.L., Constanța, August 2015

- User-friendly interface;
- Ability to be updated whenever necessary;
- Accessibility extraordinary (anytime, anywhere, even outside the classroom);
- Reusability.

With the introduction of Moodle in teaching, there has been a paradigm shift by moving from real class to virtual class, and from traditional learning to e-learning. If former pedagogy aim was acquisition of large amount of knowledge by students, today pedagogy focuses on skills training, the most important being access and information management, respectively knowledge. The computer is actually the means by which students are involved direct and personal in the process of knowledge. In other words, the "pedagogy of memorizing" was replaced with "pedagogy of searching" [Cucoș, 2006].

Virtual Classroom is an expression of reconfiguration learning groups, determined by the virtualization of education. The purpose of creating virtual classroom is to train students not only in school but also outside it, helping them to assimilate quickly and effectively new knowledge. In this way, the teacher can continue teaching outside school hours. The teaching aids used in the virtual classroom were removed from the classical model of printing on paper, being preferred combinations of audio-video materials, such as materials recorded and live broadcasts.

III. Blended learning

In cyberspace are several definitions of blended learning. The meaning has changed over time, so are considered valid only definitions developed since 2006. Such a definition indicates that "blended learning designate range of possibilities represented by combining the Internet and digital media with known forms of learning in the classroom, requiring physical co-presence of teachers and students" [Friesen, 2012].

Blended learning is achieved through learning management systems (L.M.S.), as is the Moodle e-learning platform. They facilitate the differentiation of content, process and product of learning.

Preliminary research conducted on blended learning suggests that this may provide the following advantages:

- Promote critical thinking and enhances achievement of students;
- Build the skills necessary for working and living in our century;
- Produce a greater sense of community than for face to face learning or online learning;
- Increase interaction between student and teacher, but also between the pairs of students;
- Transform the practice of teaching and learning;
- Encourage students to take control of their own learning[4].

Blended learning depends on regular access for teachers and students to computers and the Internet and that they know how to use computers. The teacher and students participate in blended learning in a computer lab or in a regular classroom, where students have access to computers for a specified period of time[5].

IV. Models used for blended learning

In essence, blended learning is a formal education program, which combines/integrates learning in front of with information technology-based learning in different proportions. Characteristic of blended learning is bringing together the advantages they have classical learning and online learning, namely quality, flexibility and memorabilia, plus unlimited access from anywhere and any time, resources, learning, and the ability to learn at your own pace.

In cyberspace are several classifications of models according to that blended learning can take place, listed below.

Widely practiced especially the U.S.A., Canada, Great Britain and New Zealand, blended learning has undergone some modification of the earlier classical models. Thus, new forms of learning derived from the original as Hy-Flex (Hybrid Flexible)[6] and Flipped Classroom "In-Class"[7].

[4] source: www.edu.gov.on.ca/elearning
[5] source: www.elearningontario.ca
[6] source: www.onlineuniversities.com
[7] source: Gonzalez, J. - "Modifying the Flipped Classroom: The "In- Class "Version", March 24, 2014

Table 1. Classification of blended learning models

Christensen Institute Classification (a)	Knewton Classification (b)	Connections Learning Classification (c)

• **Rotation**
  ○ **Station Rotation**
  ○ **Lab Rotation**
  ○ **Flipped Classroom**
  ○ **Individual Rotation**
• **Flexible**
• **À la carte**
• **Enriched virtual**
	• **Face-to-face Driver Rotation**
	• **Flex**
	• **Online Lab**
	• **Self Blend**
	• **Online Driver**
		• **Online Lab Model**
		• **Self-Blend Model**
		• **Rotation Model**
		• **Flex Model**
		• **Online Driver Model**
		On/Off-Site Rotations
		• **Fusion Lab Programs**
		• **Fusion Supplemental Programs**

Source: (a) www.christenseninstitute.org
(b) www.knewton.com
(c) www.connectionslearning.com

Courses conducted by elements from popular Hy-Flex combines online learning with classroom learning from resulting in a so-called "flexible hybrid", which increases the flexibility of the courses. This model is the right solution for students who commute to schools that have to face problems of insufficient space of classes and budgetary constraints.

Under this model, students have the freedom to study when and where they want, based on their own needs, desires and preferences. On the other hand, they can choose between online learning, classroom learning, or both. Study materials for students are offered both in traditional format and electronically (online). Among the advantages of this model are those students can form some meta-cognitive skills, while having greater control over their own learning experiences.

V. Methodology and research results

In order to assess the impact that Moodle e-learning platform and blended learning had on school pupils, we developed a questionnaire of opinion, available on-line at www.isondaje.ro/sondaj/391883307.

The questionnaire contains certain questions, such as questions of identification, control questions, dichotomous questions, multiple choice questions, and questions the scale of assessment for students' opinion on two topics. Research results were statistically processed and we present it below.

In conducting our research, we took into account the recommendations and conclusions presented in the literature abroad, at other research in the computer-assisted learning [Lipponen, 2001], [Carr-Chellman, 2011].

V.1. Case Study

Exploratory research[8] was conducted from 15th to 26th of June 2015. In this research, we conducted a case study by direct observation of students in eleven grade, specialty Technician in economic activities from Technological High School "Alexandru Borza" Cluj-Napoca. The study population consisted of a total of 16 school pupils, and the average age was 17.1 years.

Table 2. Gender structure of the population studied:

No.	*Gender*	*No. of students*	*%*
1.	Male	5	**31.25**
2.	Female	11	**68.75**
3.	**Total**	**16**	**100**

[8] Unfortunately, the current teaching loads did not make possible to create a full experiment where the teacher teaches the same subject at two different school classes in different ways, traditional and via Moodle.

V.1.1. Making curricular auxiliary

We conducted a curricular auxiliary[9] for module practice "Payment Instruments" at eleven grade, specialty Technician in economic activities. To develop this auxiliary curriculum, we used resources and activities offered by the e-learning school platform, equipped with standard Moodle functionalities. This platform can be accessed at https://alexandruborzacj.moodle.ro

We have grouped the Moodle platform specific resources and activities according to their didactic purpose, namely communication, teaching, learning and assessment (see table below):

Table 3. Grouping Moodle resources and activities according to their didactic purpose

Teaching purpose	Communica-tion	Teaching	Learning	Assessment
Moodle resources and activities	- Forum (*); - Chat (*); - Questionnaire; - User report.	- Book; - Glossary; - Power Point/Slide; - Videofile; - Web page; - URL.	- Assignment; - Essay/Assignment; - File.	- Journal; - Real-time quiz; - Questionnaire; - Big Blue Button (Virtual Classroom).

(*) The two resources can be used also for teaching, learning and assessment.

In order to achieve curricular auxiliary, we have done the following steps:

- We have identified the skills that school pupils must meet (given in the school curriculum for the subject);
- We have identified teaching activities necessary to achieve the objectives (ex. communication, teaching, learning, assessment);

[9] A curricular auxiliary is a teaching material helping teachers and students to use in teaching-learning process for adequate and effective implementation of the curriculum. Source: www.tvet.ro/index.php/ro/curriculum/153.html

- We assigned subject content provided on the number of weeks for internship;
- We added for each week of course some Moodle resources and activities required to facilitate the acquisition of knowledge, skills and skills training, that interaction with students;
- The topics addressed by the students were loaded onto the e-learning through their user accounts and were checked manually by teacher;
- We published the marks and corrections through user report immediately after homework and grading was done individually.

Resources and weekly activities added during the course were homework, assessment tests, chat, videos, glossary, discussion forum, Power Point presentation, and the user report. We added a traditional resource in digital format, which students can use during the course, namely an auxiliary curricular realized within the Phare TVET program. As an external resource, we added the websites of the National Bank and commercial banks in Romania. In doing so, we designed an interactive course that corresponds to medium/advanced level[10] (according to the Methodology on the implementation of Blended Learning System, developed by Bucharest University of Economic Studies).

Curricular auxiliary structure designed by us and uploaded to the Moodle platform includes:

- Introduction (Title of auxiliary, grade, specialization, school year);
- General skills of the discipline;
- Planning Documents (biannual planning and planning on learning units);
- Learning Units;
- Specific resources / bibliography;
- Further reading;
- Internet resources.

Lessons of synthesis and evaluation tests were performed on the handbook approved by the ministry for practice module (published in 2007). Student assignments were designed based on curricular auxiliary developed within Phare TVET program (published in 2006).

[10] source: online.ase.ro/Metodologia_BL.pdf

V.1.2. Blended learning methods for using Moodle platform

The blended learning has been achieved during the whole period of practice. *The first week of practice* (November 17 to 20, 2014) was conducted after the traditional "face to face" method of learning, when students did practice at various companies in the city. There they discussed with employees at the departments of accounting and management firms with various issues related to payment instruments. Students have completed their practical portfolio with accounting documents and payment instruments used in the respective companies.

The second week of practice (June 15 to 19, 2015) was conducted on blended learning model rotation. Rotation was experienced between actual classroom and computer lab. At first, we used version rotation between workstations. They were made up of individual work portfolio of practice (worksheets and documents typed), group work (essay and diary practice), looking information necessary for drafting essays (on-line), homework and assessment tests (on-line).

Due to the attraction and the special interest of students for information technology, at the end of the second week of practice and especially in *last week of practice* (June 22 to 26, 2015), we experienced online laboratory version, with added virtual classroom. According to this model, the rotation between workstations was performed in the lab. The entire content of the course was already loaded on the e-learning platform of school, and students studying and acting on the material taught in the computer lab, located inside the school. Students who have participated in the online laboratory took also traditional course in receiving explanations and information from teacher.

In the virtual classroom[11], the working session included a Power Point presentation about the use of payment cards in Romania and a demonstration movie about the transfer money via mobile phone. The students answered at on-line teacher's questions about two topics via chat. In this way, we obtained an immediate feedback on the knowledge acquired through online learning.

[11] We would like to express our thanks to Edu Moodle Romania network for the opportunity to achieve virtual classroom.

At the end of practice, each student received a certificate of participation (Simple Certificate) in the first course conducted using Moodle, which they downloaded from the user account.

In blended learning achievement, we respected as much as possible the steps proposed for this type of learning [Avramescu, 2014]. Thus, we had a first meeting face to face with the students before the start of practice, we set the rules of the course and we have shown how to access resources and activities posted on Moodle through examples. We showed at the students what results we expect from them, establishing means of communication that we use throughout.

Knowing that it is very important to communicate with members of the group/community learning, we had frequent conversations (both face to face and online) with students, especially during periods when they worked individually. On the Moodle platform we posted some activities for students to be involved and interact with peers or the teacher. Activities were both synchronous and asynchronous as the latter followed by a joint feedback.

Course content was common to all students. We have tried to present it in traditional form, but also in the online form, being centered on the powers provided in the syllabus module "Payment Instruments". On the other hand, we motivated students to access online course, informing them that the number and duration of connections made are important.

The teaching-learning and assessment were conducted in small groups made in the classroom. Formative evaluation was carried out during the period of practice, through the homework, tests and journal practice. The evaluation was conducted face to face in the computer lab, taking into account a user report generated for each student. We have tried to offer the students a continuous feedback, which allows us to correct any mistakes during the activities.

V.1.3. Designing Training Course

The teacher plays a multiple role in designing blended learning lessons within [Avramescu, 2014]. It begins with designing rigorous activities to be carried out and continue uploading the necessary resources on the e-learning platform (using the teacher account as course editor), directing learning in

classroom and online communication with students. Resources and activities must be chosen carefully so as to achieve the skills that students should acquire participating in the course. On the other hand, contact with students must be stressed, and communication between teacher and students within the learning community must be maintained both synchronous (chat or webinar) and asynchronous (using forum, blog or email). It is important to keep computer assisted learning "complementarity between the real and virtual" because the real aspect of learning fosters "social bond, sensitivity and emotion without which receives intelligence sense" [Cucoș, 2006, p. 43].

Regarding the design of teaching activities, we took into account of the components of a constructivist classroom, as it is presented in the literature [Carr-Chellman, 2011]: the pursuit of authentic activities, social context, offering multiple perspectives, knowledge building and meta-cognition (reflecting on his own construction). On the other hand, a constructivist classroom has certain characteristics, namely: problem-based learning, group work (through cooperation or collaboration), learning, exploring, authentic assessment (through portfolios, products and performances created by students) and a visually rich learning environment. In doing so, constructivist concepts can be integrated into the design of the training.

The steps to be followed to give students an exciting and good learning experience are [Carr-Chellman, 2011]:

- Purpose of training;
- Identifying training objectives;
- Develop items for evaluation tests;
- Analyze the characteristics of the students;
- Selecting necessary study materials;
- Selection of teaching methods;
- Implementation of the training plan;
- Evaluation and review of the training.

The basic idea, which runs like a red thread this model of professional design training, is to align the goal with training objectives, which in turn must align with test items, activities and teaching resources, etc. It must select those tools and activities that support the aim and objectives of training, even if they are not too fun or comfortable for pupils and the teacher. On the other hand,

they should be used in a more creative way possible to get good results. Since training design is an iterative process, flexible and open training materials and methods used for this must be tested and verified with a population similar to the target population (if possible), and then be reviewed. For us, this was not possible, so we were forced to make the necessary adjustments during the period of students' practice. We overlooked the fact that the classes were held during the summer, pending the great holiday.

In terms of benchmark tests we have developed for this course, their goal was not so ranking the schoolchildren, but we had the intention to see whether students have achieved the intended learning objectives. The results of students' assessment in evaluating training are presented below.

V.2. Research results

In the studied population, the vast majority of students (87.5 % of the total) have Internet access. An identical proportion uses the Internet to study or do homework. The modalities for accessing the Internet indicated that students use their own computer and mobile phone, as shown in the following table:

Table 4. Ways of accessing the internet by students

No.	*Ways of accessing*	*No. of students*	*%*
1.	Computer (P.C., laptop)	12	**46.2**
2.	Mobile phone	10	**38.4**
3.	Tablet	2	**7.7**
4.	School computers	2	**7.7**
5.	**Total**	**26**	**100**

Almost half of the students know what is an e-learning platform (56.3 % of total), and mostly used the platform for the first time (81.3 % of total). Most students surveyed indicated that the e-learning platform of high school is useful and easily accessible (see table below):

Table 5. The students point of view about the school e-learning platform

No.	*Students opinion*	*No. of answers*	*%*
1.	Easily accessible	4	**21.0**
2.	Helpful	9	**47.4**
3.	Interesting	5	**26.3**
4.	Attractive design	1	**5.3**
5.	**Total**	**19**	**100**

V.2.1. Training evaluation

Regarding training evaluation, we were interested in the following aspects:

- Resources and activities on the platform;
- Skills of students;
- Enhanced learning (including blended learning);
- Interactions involving students.

Most agreed Moodle resources and activities by students were web pages and assessment tests (named real-time quiz) (each with a share of 23.1 % of the total), followed by chat (19.2 %), as shown in figure below:

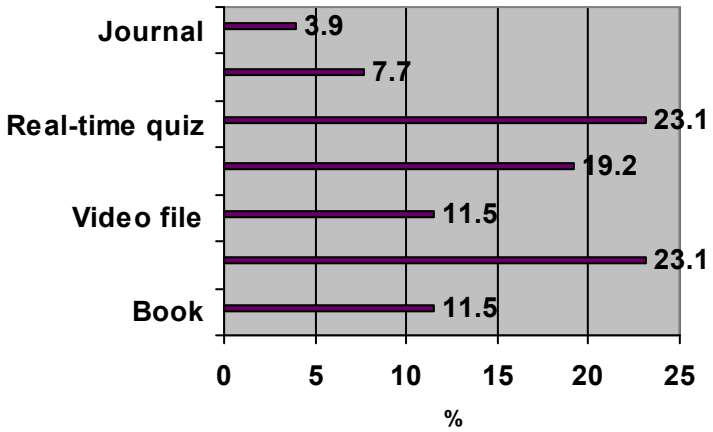

Fig.1. Moodle resources and activities agreed by students

The on-line assessment tests seem to be more attractive for school pupils than paper tests (23.1 % of total enjoyed it). They like to communicate with their colleagues using chat (19.2 % of total enjoyed it).The web pages and video files were also liked by students (23.1 % of total, respectively 11.5 %).

The vast majority of students surveyed felt that resources and activities help them to acquire/deepen expertise (see Figure 2):

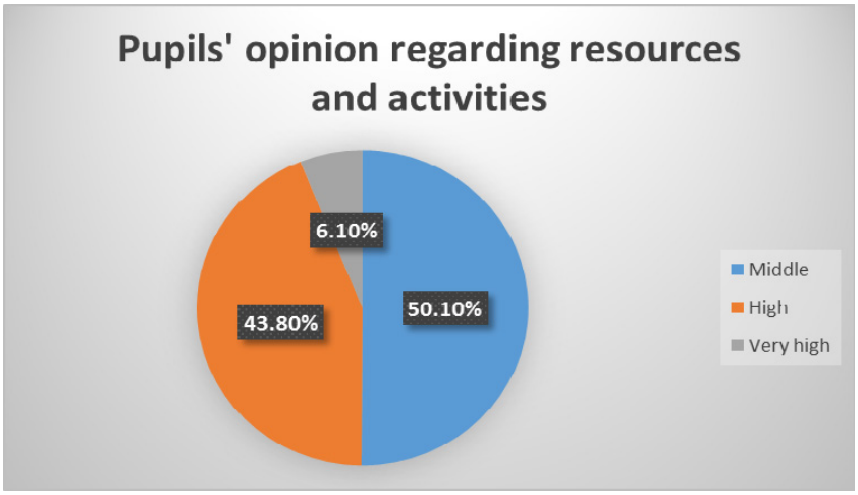

Fig.2. Extent to which resources and activities facilitate students to acquire knowledge

The main part of students (around 50 % of total) was pleased about the extent to which Moodle resources and activities helped them to acquire knowledge during the period of practice.

In this context, the students appreciated the *glossary of specialist terms* posted on the platform so: it is useful (66.7 %), is easily accessible (11.1 %) and is simple to use (22.2 %). The *homeworks* posted on the platform were considered available to half of respondents (50 % overall), easily resolved (33.3 %) and easy to send teacher (16.7 %). A usefulness meeting by *chat* with fellow pupils was appreciated for the following reasons: homework (37.5 % of total), obtaining information about the course (25 %), communication with colleagues (25 %) and solving tests (12.5 %).

By using high school e-learning platform, we have improved following skills of pupils:

Table 6. Skills improved by using Moodle

No.	*Students skills*	*No. of students*	*%*
1.	Digital skills	9	**50.0**
2.	Specialist skills	5	**27.8**
3.	Initiative and entrepreneurship	1	**5.5**
4.	Communication with colleagues/teacher	3	**16.7**
5.	**Total**	**18**	**100**

Using the Moodle e-learning platform helped the school pupils to improve mainly their digital skills (50 % of total), specialist skills (27.8 %) and communication with others (16.7 %).

Students preferences are divided somewhat equally among the three forms of learning practiced as follows: face to face learning (in class) 31.3 %, 37.4 % online learning and blended learning 31.3 % of the total answers received.

Students' opinion about blended learning methods is varied; most respondents having a good opinion (see fig. 3):

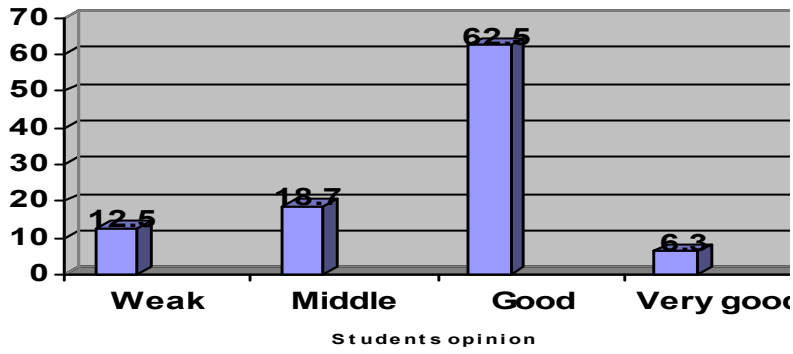

Fig.3. Students' opinion about using blended learning methods

The main part of students (62.5 % of total) has a positive opinion about using the methods of blended learning in classroom.

When using e-learning platform, it have been several types of interactions involving students, namely: student-student (31.8 % of responses), student-teacher (40.9 %), student-learning community (9.1 %), student-learning materials (9.1 %) and student-information technology (9.1 %). It notes that prevailing classical interactions between students and between student and teacher, probably due to the novelty of the teaching methods used.

The vast majority of students (93.8 % of total answers) consider that the lessons conducted online through virtual classrooms helped to acquire expertise.

Regarding the assessment carried out through online tests, it was considered as objective (41.2 % of total), easily achieved (47.1 %) and feed-back received immediately (11.7 %). User report facilitated receiving a good feedback (58.8 % of responses), complete (29.4 %) and operative (11.8 %).

V.2.2. Students assessment

Marks received by pupils at each of the two tests confirms the positive impact of blended learning on the knowledge acquired using Moodle e-learning platform, as shown in the following figure (see Figure 4):

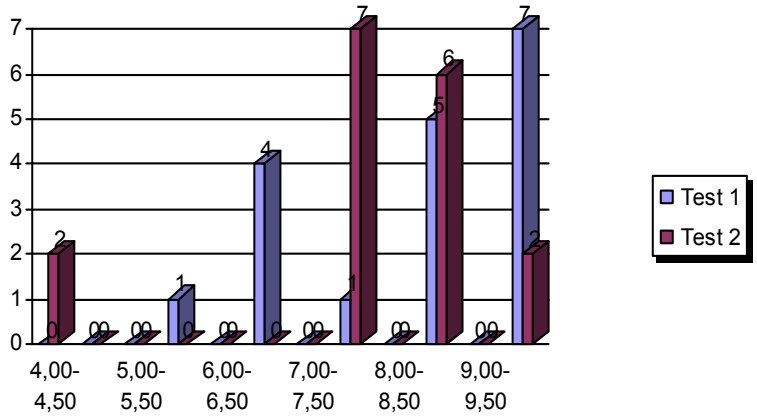

Fig.4. Frequency of marks obtained by school pupils on assessment tests

Average class for the first test (18 students were presented) was equal to 8.58 (eight 58%) and for the second test (17 students presented) was 8.04 (eight 04 %). Most of the students had scores above the threshold of mediocrity (greater than 7). At the first test, 13 students were above the threshold and 15 students for the last test.

VI. Conclusions

Implementation of Moodle e-learning platform in the high schools in our country is just beginning. Our effort to create a curricular auxiliary for economic discipline and to use the e-learning in classroom teaching is part of the broader trend of openness and internationalization of education in Romanian schools.

Our objective was to explore the opinion of school pupils regarding the Moodle e-learning platform use for teaching and learning economic subjects. Information collected from them suggested that blended learning methods are more suitable for educational process than the traditional learning methods. The results of this study encourage us to continue the implementation of blended learning and the Moodle platform use in classroom teaching.

Using computer assisted learning, respectively blended learning methods correspond to a permanent attractiveness of students for computer and other electronic means. This allowed us to carry out an interesting and dynamic training, where the students participated in multiple interactions. In doing so, the students have improved digital competence and expertise, worked and communicated better than within a traditional classroom activities.

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