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ŞTIINŢE SOCIO-UMANE

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Section

SOCIO-HUMANISTIC SCIENCES

CONTENTS

MEANING IN LIFE FOR ADOLESCENTS AND YOUNG ADULTS

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Abstract. This research investigates the way in which adolescents and young adults report to the topic of meaning in life. More than 50% of the adolescents and young adults investigated are preoccupied with seeking a general meaning and a religious meaning in life. The general meaning in life does not depend on age, status, gender and profile of the subjects investigated. Young people with explicit interests in religion have high scores in religious meaning compared to those with technical interests. For 40% of the investigated subjects, family is a traditional source of meaning and only for 27% does religion have the same role. The adolescents and young adults are able to explore independently the problem of meaning, but they need support and help to move forward.

Keywords: general meaning; religious meaning; fields of meaning; the educational process.

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1. Introduction

In the psychological research of the latest decades there has been a growing interest in certain topics, consecrated in philosophy and theology. A philosophical topic researched in positive psychology, the meaning in life, has offered useful results for the clinical practice, and the lack of meaning in life, the loss and the search for meaning has become a frequent issue in therapy.

This research investigates the way in which adolescents and young adults (between 17 and 25 years old) report to the topic of meaning in life. Adolescents and young adults face the process of development and consolidation of their own identity, as well as defining a frame of the meaning. During this period of life, they have a high level of emotional maturity, cognitive and motivational abilities, values and experiences necessary to design their meaning in life.

Even though this task of development has been the same throughout several generations, young post-modernists become a challenge for the adults with educational and professional roles. Contemporary adolescents and young adults seem to allow themselves to be less influenced by the traditional value directory lines, coming from family and religious background. Having a higher degree of freedom and autonomy than the previous generations, the young ones are more intensely exposed to responsible choices and the risk of refusing some values and sources of meaning that can guide them in life. Lacking that, their conceptions of life and their activities are centred mainly as objective-pleasure, which models their beliefs about the world and life, and implicitly their meaning in life. Searching and preferring easy activities, which bring a high dose of pleasure (games, films, entertainment, socialising online, etc.), as well as quick results and gains with less work, can be a source of worry for all the categories of adults involved in the education of young adults. In recent decades, ever more young people have become anxious, aggressive and narcissistic, as a result of their unorganised lifestyle, lacking a more profound and long-term meaning.

The initial questions at the basis of the research were as follows: What types of meaning in life are considered more important by the adolescents and young adults? The general meaning or the religious meaning? What is the relation between the spiritual/religious and personal/general meaning of life?

2. Conceptual Delimitation: General Meaning and Religious Meaning

The concept of meaning in life has received several definitions: a fundamental human motivation (Maslow, 2007), a feeling of order and coherence that acts as a tampon for deficient psychological and physical health, tendency to an existent purpose (Reker and Wong, 1988), a set of objectives to

work for and to reach, a meaning for the existence of somebody or something (Steger *et al.*, 2006). The meaning can be obtained by involving oneself in significant activities, obtaining an understanding of self and world, creating a work or deeds, attitude toward inevitable suffering, focusing on pleasant activities, reaching one's own potential or supporting someone to reach it, serving others or dedicating oneself to a greater purpose, aspiring to a cosmic meaning (Reker and Wong, 1988).

The importance of having a meaning in life can be conceptualised also by thinking about the lack of meaning. Those who feel that life lacks meaning are more vulnerable when thinking that there is no reason to live anymore. These feelings of inner "emptiness and void" are often what makes individuals seek therapy, and researchers believe that some clients start counselling by the remediation of these feelings of lack of meaning (Yalom, 2010).

It was supposed that anyone looking for answers to the questions regarding meaning could be considered a religious person. The person looking for meaning in life through science, drugs, power, etc., could be considered as religious as the person looking through transcendental means (Pargament, 1997). Yet, looking for meaning becomes religious only when it involves the connection with the sacred, with God. In a study by Steger and Frazier (2005), meaning in life has mediated the relation between religiousness (namely the frequency of attending religious service and praying) and life satisfaction.

3. Meaning in Life in Adolescents and Young Adults

Adolescence is an extremely critical and important stage in the development of the personality. Most of the physiological, psychological and social changes take place during this period of life. Adolescents and young adults seek for a meaning of self, that is why having a purpose in life can help the identity crisis, a normal period in the development of the personality, as even Erickson (1994) shows. Erickson states that the self is formed by means of some periods of development crises, with two outcomes: identity and role confusion. When there is support from the socio-educational environment, the adolescent's potential will develop according to their wishes and intentions, and their identity will become more coherent. But when there is no support according to the adolescent's expectations, role confusion appears.

A major task for late adolescence and the young adult is to consolidate an identity by means of beliefs, values and objectives that they choose, to be able to make decisions in life and formulate moral judgements. When an adolescent's objective for a future career comes from the knowledge of abilities, interests and personal efforts, the presence of this work objective indicates the progress in articulating a certain identity. In this sense, young people try to understand not only the way in which their work objectives incorporate who they want to be, what they want to do professionally, but also the way in which

their work brings a social contribution, strengthening the feeling that they have a purpose.

4. The Importance of Creating the Meaning in Adolescence

The process of searching for meaning and getting involved in exploring the meaning of life is also related to the task of developing identity in adolescence. Several researchers have reported the centrality of forming identity in the period of adolescence and its connection with the meaning (Kiang and Fuligni, 2010; McLean *et al.*, 2010).

Research has shown that adolescents and young adults are able to engage in the process of creation and search for meaning (McLean *et al.*, 2010). Numerous studies have documented the relation between meaning/purpose in life and wellbeing for young adults (Burrow *et al.*, 2010). In their study with 318 students, they have noticed that those who engaged to explore the meaning and purpose in the adolescence period were more adapting, positive, full of hope and more capable to adapt efficiently the development challenges. In their study on creating meanings, McLean *et al.* (2010) reported that the possibility to give meaning to the difficult events in life is positively related to self-esteem, physical and psychological health. Kiang and Fuligni (2010) picked up adolescents, Latin Americans, Europeans and Asians, and discovered that the meaning is related to the feeling of ethnic identity, general wealth, self-esteem, attitude and motivation toward school. Creating meaning, regarding the development of identity in adolescence, has clear personal, social and academic implications.

A meta-analysis of the studies investigating the purpose and meaning in adolescents confirmed the importance of the meaning in healthy self-development and the benefits that extend into adulthood (Damon *et al.*, 2003). These observations suggest that a feeling of the meaning in adolescence has a positive impact on people's contributions to society throughout life. In other studies, in adolescents, young adults and mature adults, life satisfaction was related to a feeling of purpose and recommended early adolescence as an ideal moment for counselling, to facilitate the search for meaning and purpose in life (Bronk *et al.*, 2009).

Blair (2004) noticed that the lack of meaning along adolescents was often the cause depression is based on, manifested externally by aggressiveness or defiance, and internally by isolation, ideas or suicide intentions, anxiety, involvement in damaging behaviour (abuse of substances). Adolescents looking for a higher meaning in life can use drugs as a way to experiment and connect with life, on what they consider to be a more profound level.

Lack of meaning among adolescents can also influence the educational process. In their study on boredom and meaning, Melton and Schulenberg (2007) found a significant, negative correlation between boredom and search for

meaning. Boredom resulting from the lack of meaning can manifest by dis-involvement of adolescents in the educational process.

5. Design of Research

5.1. Objectives and Hypotheses

The objectives of this study are to: O1. Identify as presence and search for the general meaning in life and the religious meaning in the mentioned group; O2: Classify the main domains that offer meaning for adolescents and young adults. The hypotheses of the study are: Hypothesis 1: Over 40% of the adolescents and young adults investigated seek for or have found a meaning in life. Hypothesis 2: There are no significant differences between the subjects of feminine and masculine gender regarding the seeking for or presence of the general meaning in life. Hypothesis 3: Education, family and friends are the most important sources/fields of meaning for adolescents and young adults.

5.2. Variables

Dependent variables of the study are the general meaning in life and the religious meaning. Independent variables of the study are: age, status, gender, profile, positive and negative emotions.

5.3. Instruments

The following questionnaires/scales translated from English have been used.
– Questionnaire MLQ (Meaning in Life Questionnaire) has 10 items and assesses the presence and search for the meaning in life, a general meaning in life (Steger *et al.*, 2006.)
– Subscale of the religious/spiritual meaning makes part of the Multidimensional Measurement of Religiousness/ Spirituality for Use in Health Research (MMRS) has 20 items and measures aspects of an explicit religious meaning (Fetzer Institute, 2003).
– Scale of Positive and Negative Experience (SPANE) has 12 items, with six items to evaluate the positive emotions and six items to evaluate negative emotions (Diener *et al.*, 2009). Because of the fact that the subjects filled in the questionnaire in the context of COVID pandemics, the list of emotions was partially adapted, adding other emotions (inspired, alert, depressed, isolated).

5.4. Participants

The participants were 130 pupils in the 12th class and students in different years of study. Information about the participants: age: 17-18 years old - 21 subjects; 19-25 years old - 109 subjects; status: pupils - 31, students - 99; gender: male - 55, female - 75; profile (school/faculty): theologic - 45, technical - 78, other - 7; religion: Orthodox - 118, other - 12, background: urban - 65, rural - 65.

5.5. Procedure

The questionnaire for research was created in Google Forms, which summed up the tools mentioned above, likert scales of response and one single open item that refers to: "Indicate three fields/activities in your life that offer you the feeling of meaning in life". After collecting the email addresses from the teachers and professors of the participating pupils and students, the link for acceptance to research and questionnaire completion was sent. The message on information and consent was sent to 200 participants. The outcome was the informed agreement of 131 respondents, and 130 valid responses were obtained. The analysis of data was done with the SPSS programme, version 23.

5.6. Analysis of Data and Discussions

The tools used were translated from English, that is why it was necessary an assessment of the internal consistence of the items for each questionnaire. The alpha coefficient of exactness was used as assessment method. The alpha coefficient for the MLQ questionnaire has a value of 0.63, which shows an acceptable level of exactness; for the MMRS questionnaire the alpha coefficient has value 0.97, a good level of exactness, and for the SPANE questionnaire, it has the value 0.52, which proves that the scale has an acceptable level of exactness.

Pearson correlations of the general and religious meaning with independent variables: age, status, gender, profile show that:

The (general) meaning in life has a negative, weak and insignificant correlation with age (r=10, 13, p=0.13), status (r=-0.03, p=0.71), gender (r=-0.01, p=0.88) and the subjects' profile (r=-0.02, p=0.75), which shows that the general meaning in life does not have any association with these independent variables. The religious meaning has a negative, weak and significant correlation with age (r=-0.25, p=0.003), negative, average and significant with the subjects' status (r=-0.31, p=0.000) and profile (r=-0.42, p=0.000), which shows that there is an association between the religious meaning and the educational status (pupil/student) and the subjects' profile of studies (theology/technical).

Pearson correlations between the sub-factors of the meaning in life: seeking meaning and the presence of the meaning bring new information. Seeking meaning in life and a positive, weak yet significant correlation with the negative emotions (r=0.22, p=0.01), which means that the subjects who seek a meaning in life have the tendency to live predominantly negative emotions.

Test T for religious meaning (SR) and subjects' profile (see Table 1 and 2) shows that the difference between the value SR for the young adults with theology profile (M=84.64, SD=10.97) is significantly higher (t=7.35, df=120, p=0.00 two tailed) that that of the young adults with technical profile (M=63.89, SD=20.30), which means that the religious meaning is more present in the young adults preoccupied explicitly with religion.

Table 1 and 2
Test T for Religious Meaning and Profile of Subjects

Group Statistics

	profil	N	Mean	Std. Deviation	Std. Error Mean
Sensul religios	Teologic	45	84,6444	10,97136	1,63551
	Tehnic	78	63,8974	20,30584	2,29918

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Sensul religios	Equal variances assumed	16,706	,000	6,334	121	,000	20,74701	3,27547	14,26235	27,23167
	Equal variances not assumed			7,353	120,602	,000	20,74701	2,82155	15,16082	26,33320

Test T for general meaning (SG) and subjects' gender shows that the difference between SG values for young adults of masculine gender (M=35.8, SD=4.7) and those of feminine gender (M=35.6, SD=5.67) is 0.94 and is insignificant (equal variances). The trust interval 95% for this difference is -1.72 l at 1.99, t=0.14, df=128, p=0.8 (see Table 3 and 4).

Table 3 and 4
Test T for General Meaning and Profile of Subjects

Group Statistics

	gen	N	Mean	Std. Deviation	Std. Error Mean
Sens general	masculin	55	35,8000	4,75083	,64060
	feminin	75	35,6667	5,67196	,65494

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Sens general	Equal variances assumed	2,727	,101	,142	128	,888	,13333	,94140	-1,72939	1,99605
	Equal variances not assumed			,146	125,683	,885	,13333	,91614	-1,67973	1,94640

Test T for the religious meaning (SR) and subjects' gender (see Table 5 and 6). The difference between the SG value for young adults of male gender (M=73.4, SD=21.20) and female gender (M=69.66, SD=19.73) is 3.73, and is insignificant (variances are equal). The trust interval 95% for this difference is -3.43 at 10.9, t=1.03, df=128, p=0.30. Hypothesis 2 is confirmed, which means that there are no significant differences between female and male subjects in respect of seeking or presence of religious meaning (SR) in life.

Table 5 and 6
Test T for Religious Meaning and Gender of Subjects

Group Statistics

	gen	N	Mean	Std. Deviation	Std. Error Mean
Sensul religios	masculin	55	73,4000	21,29824	2,87185
	feminin	75	69,6667	19,73906	2,27927

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Sensul religios	Equal variances assumed	,463	,497	1,030	128	,305	3,73333	3,62353	-3,43644	10,90311
	Equal variances not assumed			1,018	111,245	,311	3,73333	3,66642	-3,53174	10,99841

For the open item: "Mention three fields/activities in your life that offer you the feeling of meaning in life" for which 108 answers were obtained. The organisation categories in the subjects' answers were extracted, and frequency was calculated. The first 13 categories were selected in the table below.

Table 7
Categories and Frequencies for Fields of Meaning

Category/Domains of meaning	Key Words	Frequency
1. Art	Art, beauty, music, literature, poetry writing, visual arts, painting, piano, drawing, theatre, dance, photography, design	43
2. Family	Family, the close ones, time and activities spent with family, parents, brother, family life	39
3. Spirituality/religion	Spirituality/religion, church, Christ, theology, faith, sung in the lectern, religious, confessor, spiritual/spirituality, God	29
4. Social rules	Professor, waiter, artist, painter, interior designer, school counsellor, education, profession, economist, priest, social, medical	20
5. Friends	Friends, friendship	17
6. Sport and physical activities	Sport, jogging, cycling	14
7. Philanthropy	Volunteering, helping people, good deeds	10
8. Faculty/school	Faculty/school	8
9.1. Nature	Nature, time and walking in nature	7
9.2. Work	Job, work	7

As for the fields of meaning chosen by the respondents, it is noted that the highest frequencies was registered for the field Art (43 answers). Subjects used terms such as art, beauty, music, literature, poetry writing, visual arts, etc. In second place is Family (39 answers), predominantly using words such as: family, close ones, parents, etc. On the third position is Religion/Spirituality (29 answers), participants indicating religion, spirituality, church, God.

Hypothesis number 3: Religion, family and friends are the most important sources/domains of meaning for adolescents and young adults, was partially confirmed. Family and religion got second and third position in the hierarchy of the domains of meaning for adolescents and young adults, and friends the position 5. We consider that hobbies related to the field of art are preferred and constant preoccupations, which bring pleasure, knowledge and personal satisfactions to the investigated subjects. Only for approximately 40% of the investigated subjects is family a traditional source of meaning and only for 27% does religion have the same status.

6. Conclusions

More than 50% of the adolescents and young adults investigated are preoccupied with seeking a general meaning and a religious meaning in life. For approximately another half of the subjects, the presence or seeking for meaning is low, a fact resulting in the scores obtained for the two questionnaires.

The general meaning in life does not depend on age, status, gender and profile of the subjects investigated and there are no significant differences in the SG scores between groups according to profile and gender. The religious meaning has a negative and significant correlation with the subjects' age, status and profile, which shows that there is a relation between the religious meaning, the educational status (pupil/student) and the study profile of the investigated subjects (theology/technical). Young people with explicit interests in religion have high scores in SR compared to those with technical interests.

For 40% of the investigated subjects, family is a traditional source of meaning and only for 27% does religion have the same role.

This study, by exploring the meaning in life, can anticipate that approximately half of the adolescents and young adults investigated can face crises specific to the challenging transitions they cross. On taking into consideration the way in which research has documented the meaning and purpose in life in adolescents and young adults, school counselors can value these discoveries in practice. The adolescents and young adults are able to explore independently the problem of meaning, but they need support and help to move forward (Blair, 2004). A school counselor or psychologist can help young people create or seek a personal meaning, analysing life with its difficult circumstances, exploring what they have learned about themselves out of it. Even though there is a reduced number of studies about the formation of the school counselor/psychologist to approach meaning in life, in practice they already work with this topic (Schwarz, 2016), which is an important step to develop the topic of this research.

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SENSUL ÎN VIAŢĂ LA ADOLESCENŢI ŞI TINERI ADULŢI

(Rezumat)

Această cercetare investighează modul în care adolescenţii şi adulţii tineri se raportează la subiectul sensului în viaţă. Peste 50% dintre adolescenţii şi tinerii adulţi investigaţi sunt preocupaţi de căutarea unui sens general şi a unui sens religios în viaţă. Sensul general în viaţă nu depinde de variabilele independente: vârstă, statut, gen şi profilul educaţional al subiecţilor investigaţi. Tinerii cu interese explicite pentru religie (cu profil teologic) au scoruri ridicate la sensul religios comparativ cu cei cu profil tehnic. Pentru 40% dintre subiecţii anchetaţi, familia este o sursă tradiţională de sens şi doar pentru 27%, religia are acelaşi rol. Adolescenţii şi tinerii adulţi sunt capabili să exploreze independent problema sensului în viaţă, dar au nevoie de sprijin şi ajutor pentru a merge mai departe.

LEARNING IN YOUNG PEOPLE. ITS SPECIFICITY AND THE CHALLENGES OF THE KNOWLEDGE SOCIETY

BY

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Abstract. The article connects several current concepts: the knowledge society, the student-centered educational system, constructivist learning in young people, the virtual environment of learning and education. At the heart of applying these concepts in educational practice are young people who, although beneficiaries of the constructivist knowledge and education society, are called to maintain with energy and their creativity the dynamic and the progress of the knowledge society in a continuously ascending constructivist paradigm. In the introduction of the paper, the knowledge society is defined from the perspective of several authors and the digital personality is sketched, as a new type of personality specific to young people, formed under the domination of the computer. The second part of the paper discusses constructivist learning, in the student-centered education system, the constructivist teacher's attitudes forming the constructivist student's creative attitudes. The third part of the article addresses young people learning in the virtual environment, the process of virtualization of education with actors, new content, methods, means, forms of organizing education, positive and negative aspects of virtual education. At the end of the paper, reference is made to cyberculture as a synthesizing concept of the current cyber movement.

Keywords: knowledge society; constructivist learning in young people; student-centered education; virtualization of education.

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1. Introduction. The Knowledge Society and the Role of Young People in Building it

Mankind has gone through several periods in its history, named and characterized by the main technologies generating progress: agricultural, industrial, post-industrial (services) and knowledge. In the late 1990s, the digital convergence of information and communication technology led to a leap forward to the knowledge society. The new information products and services are applicable in all sectors of the economy but also in all areas of social life, in public administration and politics, in business and art, in education and sports. In this perspective, in the 21st century, there is a "transition from an information-based economy to a society based on knowledge, in which the following aspects are predominant: a) the fifth order sector", decisive for the overall progress, supported by quality social assistance, quality scientific research, **quality education**, pedagogically capitalized free time, as an expression of a good lifestyle; b) the managerial factor engaged in the qualitative management of society through a "new emphasis, prioritized on lifelong learning and investments in education" (Marshall, 2003).

The current knowledge society (1990) has overcome the stage of the information society in which the centre of gravity was information and information technology, being characterized (Drăgănescu, 1987) by the following aspects:

– scientific knowledge is oriented towards overcoming the single truth and discovering multiple truths;

– knowledge management in the form *of technological knowledge and organizational knowledge,*

– producing new technological knowledge through *innovation,*

M. Drăgănescu (2003) believes that in the knowledge society *technological vectors*, which generate new knowledge are:

– advanced internet;

– e-book technology;

– intelligent agents who are in fact expert systems with artificial intelligence;

– intelligent environment for human activity and life;

– nanoelectronics, which will become the main physical support for information processing, but also for many other functions not only of the knowledge society but also of the consciousness society.

The functional vectors of the knowledge society, those that activate the technological vectors are, according to Drăgănescu (2003), the following:

• the knowledge *management* of enterprises, organizations, institutions, local and national administrations (the learning organization),

• the *management* of the moral global use of knowledge (the ethics of knowledge),

• the biological and genomic *knowledge* biology and genomics,

• the social and individual *healthcare* system

• *nature conservation* and promoting society sustainability and durability through a specific management of knowledge

• in-depth knowledge about existence,

• generating new, technological knowledge,

• *the development of a culture based on knowledge and innovation,*

• *an education system based on the methods of the information and knowledge society (e-learning).*

If the agrarian society generated agricultural products, the modern industrial society manufactured industrial products, the postmodern society delivered services, *the current knowledge society produces knowledge. It is, for the first time, a society of learning, science, research and innovation. Knowledge is considered the core of the economic, social, administrative, educational, and cultural development and the largest investments are productive in the field of knowledge.*

A. Toffler (1995) identifies the following features of the knowledge society:

1. knowledge is society's main resource of progress;

2. electronic computer networks, software products, computer and communication services are society's goods;

3. information technologies are not energy consuming but ecological;

4. the largest share of costs is in design and investment activities;

5. the exchange of information is done without loss, the information obtained can lead to a significant increase in the value of the initial information;

6. the professional activity with the help of computers does not generate unemployment but new activities that absorb labour;

7. education is more flexible according to the requirements of perspective;

8. access to information is directly based on computer networks;

9. the democracy of society is participatory.

The young people in the knowledge society were born in the presence of the current tools of knowledge, the computer and the Internet, they grew up with the improvement of these means of knowledge, they represent a digital generation, building a digital personality.

Analysing the influence of the young individuals' way of working with the computer on the formation of their personality, we can sketch some aspects

of the change. We can say that the digital personality that is formed in young people has a totally distinct profile from the Gutenberg type personality characteristic to their parents.

The digital personality is characterized by:

• from a cognitive point of view: attention is ***dispersed*** to multiple sources of knowledge, perception is predominantly ***visual***, thinking becomes ***divergent, synthetic*** because the computer is based on image, it provides multiple information that the young person must combine, assemble, link.

• from a socio-affective point of view, the young person's *digital personality* is more sociable than individualistic, more collaborative than competitive, more casual, bolder, more confident and optimistic, because young people have knowledge at hand, they need each other in a group spirit, sometimes even in a herd spirit, not only inside networks of knowledge and but also in informal, consumer communication.

Of course, the digital personality, in a knowledge society, also has darker aspects, being - we consider - more extremist, going through trial and error, sometimes more violent, without limits and constraints. In a world of image, of speed, of all possibilities, appearance is more important than the essence of things (Carr, 2012).

The role of young people in the knowledge society is central because their education, professionalization and useful activity takes place in the knowledge society. No other age is so intrinsically linked to the knowledge society, the computer, the internet. From preschool age, students are enrolled in a computer-based education system, using mobile phones and the Internet. In the primary classes there are lessons that are carried out with the help of the computer. In secondary school and high school, the current education cannot be designed without a computer. In higher education, students do computer-assisted training, specializing in various computer programs. When engaging in socially useful activity, there is no professional field that does not use modern computer means. The young person's social, family, cultural life is dominated by the computer and internet, social networks, informal activities carried out with the help of computer.

2. The Constructivist Learning in a New Person-Centered Educational System

The roots of constructivism can be found in the Greek philosophers Heraclitus (*everything flows*), Protagoras *("man is the measure of all things*; of the things that are, that they are, and of the things that are not, that they are not")* and Aristotle (The Nicomachean Ethics). In 1934, the French philosopher Gaston Bachelard (1884-1962) argued that "Nothing proceeds from itself. Nothing is given, *all is constructed...*" and, in 1967, Jean Piaget (1896-1980)

used the expression "*constructivist epistemology*". The psychological theories underlying constructivism are based on Piaget's research that led to the model of cognitive development of the psyche. Mental structures are gradually formed by internalizing action. Learning is not based on perception but on the *construction of new mental structures* starting from the action in which the child engages with the objects. Vygotsky's research refers not only to the child's experience with objects but also to the social group in which the child acts and to the group's influence on the child. J. Bruner shows that learning is an active process in which students build their own new knowledge structures depending on their own experience, on the concrete way in which they select, organize and manage the experience.

Educator J. Dewey showed how authentic knowledge is obtained, through one's own experience and not by receiving information about the experience of others. The method that can be used successfully to gain authentic knowledge is the problem-solving method. This consists in: a) creating an empirical situation; b) stating the problems; c) reactualising earlier experiences; d) formulating the hypothesis and verifying its validity.

The uttered knowledge is not efficient, the students themselves build their knowledge, in school under the coordination of the teacher, through their own experience, through discovery and problem solving. The teacher must provide the student *with learning opportunities*, provide *the learning environment*, in which students *build* their *understanding*, they assimilate the environment and adapt to it.

In the constructivist vision of education, the student is active, curious, experiments, works individually or in groups, seeks information, exchanges opinions with others, formulates conclusions, develops his mind, forms his beliefs and attitudes, builds his reality and self-constructs. The constructivist teacher (Joiţa, 2007) knows the pupils / students, their intellectual possibilities, aptitudes, their interests and preoccupations, *guides and orients* the pupils/students towards different sources of information, different situations from reality, coordination and collaboration, *supports and encourages* students from a cognitive point of view but also emotionally, motivationally, behaviourally, provides them with methods and tools for knowing and transforming the world.

We can describe (Tiron, 2017) in this sense the attitudes of the constructivist teacher in the natural correlation with the attitudes of the constructivist student.

Attitudes of the Constructivist Teacher

- is receptive and open to the needs of the pupils/students,
- knows the pupils through different methods and tools,
- accepts pupils as students in a Rogersian vision of unconditional love,

• respects the creative potential of the pupils/students,
• builds the learning environment,
• guides, leads, directs students in learning,
• monitors the progress of the pupils/students,
• is interested in the competences of the pupils/students, their skills, abilities and talent,
• shows reflexivity both towards the behaviour of the pupils and students and towards learning,
• knows how to listen,
• knows how to ask questions,
• motivates pupils/students,
• encourages pupils/students,
• supports pupils/students in their actions of learning, problem solving,
• provides permanent feedback to students,
• in evaluation he/she appreciates the autonomy, the initiative, the critical spirit, the creativity of the student by measuring the formed competences.

Attitudes of the Constructivist Pupil/Student

• refers to the teacher as one of the sources of knowledge but not the only one,
• manages his/her emotions, feelings about learning and others well
• learns by solving problems,
• has an increased autonomy in learning but also in relationships with others,
• appreciates their own work and that of their colleagues,
• learns to make decisions,
• the learning process is a priority over its product, learning is more important than evaluation.

Constructivist learning/teaching can be put into practice in a student-centered educational system, in a creative, knowledge society.

Student-centered education (Tiron, 2017) is an approach to education that relates primarily to the **needs of pupils/students** and not to those of teachers or the school (Rogers, 1966). Curriculum design starts from the educational needs of pupils/students, in a Rogersian conception of the human being who needs *unconditional love, support and congruence* (harmony and non-conflict) in order to develop. The curricular contents satisfy these educational needs of the pupils/students through interactive and creative methods.

The teaching process gives students more **autonomy and control** over the choice of study subjects, methods and pace of learning. The pupils/students

themselves are involved in making decisions about the content, methods and moments of learning (Gibbs, 1992). Pupils and students are not put in front of the accomplished fact regarding the choice of learning contents by the teacher but they have the freedom to propose topics, subjects, bibliography, working methods, deadlines.

Student-centered education is based **on the educational context** from which the student comes and on tracking **progress** in achieving learning objectives. The learner-centered education considers pupils and students capable of taking responsibility for learning, while the teacher assumes responsibility for facilitating the educational process. The educational process thus acquires an individual character that aims at the formation of competencies, through different methods, means and procedures from one pupil/student to another, without constraints of time and space (AFC Arizona Faculties Council). The teacher learns new educational roles of coordination, counselling, guidance, orientation, motivation, support for learning and learners. In this way, part of the responsibility for learning lies with the pupils/students.

The didactic requirement is to put the child and not the subject of education at the centre of the instructional process. It is about starting from the **interests and needs of children**, to stimulate their own effort in the formation of skills (Triff, 2012). In order to meet this requirement, teachers must know the skills, interests, motivation, competences of pupils/students both in their subjects and in other non-formal and informal concerns of theirs.

It is a **methodology** for orienting the didactic activity, which allows, through a system of concepts, ideas and modes of action, ensuring and supporting the processes of **self-knowledge, self-building** and **self-realization** of the child's personality, developing his unique individuality (Triff, 2012). Being known by the teacher is only effective in relation to the self-knowledge of the student himself, in order to be able to manage his forces and evolution. Student-centered learning describes **ways** of thinking about learning and teaching that emphasize **their responsibility** for activities such as learning planning, **interaction** with teachers and other students, **research** and **assessment of** learning (Cannon, 2000).

Student-centered learning refers to the **situation** in which they **work** both in **groups** and **individually** to *explore* problems and actively process knowledge, overcoming the stage of passive receptors of knowledge (Harmon & Hirumi, 1996). *Group work* forms skills of communication, collaboration, comparative analysis and synthesis of learning outcomes contributing to the maturation of pupils/students.

Student-centered learning is an **extended approach to learning**, which involves replacing lectures with **active learning**, integrating **self-paced** learning programs, and/or group **cooperation** situations, which ultimately give the student the **responsibility** for one's own progress in education (Nanney, 2004). Classical lectures can be improved themselves by applying procedures specific

to interactive and creative methods: heuristic conversation, problematization, brainstorming.

The student-centered learning environment focuses primarily on **meeting the needs of the educated**, while the subject-centered learning environment focuses primarily on a set of knowledge (Clasen & Bowman, 1974). Knowledge can not be assimilated by the student unless those appropriate cognitive structures of receptivity, analysis and synthesis, comparison are formed, but also motivational structures, of specific interests and concerns.

Post-modern pedagogy is often developed in the postmodern, informational society, based on knowledge in a new **curricular paradigm** (Cristea, 2017).

It tries to overcome both the psychocentric education paradigm (centred on the psychological requirements expressed in terms of abilities, skills) and the sociocentric education paradigm (focused on social needs – economic, communitary, political, etc.), through the curricular design of education, centred on **the aims of education** (ideals, goals, objectives of education) always conceived at the level of the necessary interdependence between the psychological demands (expressed in terms of competences) and the social needs (expressed in terms of content base, validated by society at different periods of time).

The curricular paradigm of education aims to capitalize in any educational activity, at all levels and disciplines of education, all general contents of education (moral, intellectual, technological, aesthetic, psychophysical) and general forms of education (**formal, non-formal, informal**) in the context of the resources offered by them in the perspective of lifelong learning and self-education.

In conclusion, we highlight the re-evaluation and reconfiguration of the learning principles as follows:

- Learning to learn and use this skill throughout life (not only learning but especially learning *technology and management,* which answer the question of *how to learn* becomes essential for life);
- To learn *to experiment*, to correct mistakes and to solve problems (not to stop at the learning product but to be aware of *the learning process*, to search, to check, to correct, to innovate permanently);
- Learning to cope with an enormous amount of information, to demonstrate critical and valorization competence (to know how *to look for* not only to find, to know how *to select*, understand *what is important* or less important);
- To learn to concretize the principle of change and to live in an environment that is *constantly changing* (*to accept change but also to produce change*);

Learning to ***cooperate*** with others in achieving purposeful collective intellectual tasks (establish effective social relationships, collaborate, share.

3. Young People's Learning in the Virtual Environment

The appeal to new information technologies has a *history* and manifests itself in several forms (cf. Michel, 1999):

a. computer-assisted education and learning, from kindergarten to postgraduate education,

b. electronic courses and teaching programs that can be stored on the web or compact discs;

c. flexible *self-training and self-learning routes, for example,* for a new job, for learning a foreign

language;

d. distance training and education, for example television education;

e. multimedia assisted training involving text, sound effects and animations, diagrams, images/videos.

f. asynchronous training and/or learning (discussion forums, blogs),

g. interactive training that emphasizes the collective process of learning and training;

h. formation based on the interaction between the different groups of educated, educators, tutors;

i. educational databases, designed as capitalization tools, educational resources, mostly digital;

j. education or training platforms and international dissemination systems (for example, the European system EUROPACE);

k. virtual universities, supported by traditional universities or which have become autonomous.

A *Commonwealth of Learning* report, coordinated by Glen M. Farrel (2001), captures the *main trends* in virtual education, succinctly expressed by the following features (Cucoş, 2006):

1. Virtual education is realized through more and more **educational instances**, formal, non-formal and informal, through which the initial and/or continuous training takes place.

2. Development of a **specialized industry** of devices, programs, digital structures with exclusively educational functionalities.

3. Formation of a new **pedagogical culture** for supporting and advising those who are trained in virtual or online networks.

4. Development, testing and implementation of **new organizational** and learning management **models** under the impact of new technologies.

5. Ensuring **quality control** by issuing clear formulas for accreditation, monitoring and validation of virtual training courses.

The process of virtualization includes several components, from the subjective and objective aspects, to the relational or procedural ones. Virtualization targets several instances of formal, non-formal, informal education: trainers, contents, strategies, management, different environments (cf. Michel, 1999; Cucoş, 2006):

a) the ***actors involved***:

– *people,* who can benefit from remote virtual resources, at various training routes;

– *learning* groups: thematic groups, joint projects, closed or open groups;

– *trainers,* especially teachers or resource providers,

– different groups of resource persons, or *pedagogical groups*, located beyond the school perimeter (study engineers, experts, etc.);

– *tutors, learning colleagues or other contributors* who supervise internships, projects, specific activities;

– permanent or temporary *mixed groups or communities* (composed of educated, teachers, tutors), open or closed, formed around specific projects.

b) the ***contents being circulated, programs, disciplines***:

– traditional didactic elements virtualized at different levels: lessons, learning units, lesson chains;

– pedagogical supports: case studies, supporting bibliographies, reference texts, projects;

– training courses, individualized or designed for a target audience;

– peripheral, adjacent, complementary or optional contents to which educations can relate.

c) ***evaluation procedures and tools***:

– formative assessment tools that ensure and stimulate learning progress (exercises, tests, questionnaires, reflection activities or specific questions);

– summative assessment tools (virtual examinations, essays, portfolios, etc.);

– assessment of knowledge in line student with student or in groups, forums, etc.

d) ***logistical and pedagogical support resources***:

– computer and office resources (computer applications);

– various computer media (CDs, DVDs, flash memories, hard disks);

– documentation or virtual libraries;

– logistical tools for projects or practical internships.

e) ***management procedures regarding training***:

– candidate selection procedures: tests, portfolios;

– actual registration methods;

– managing tax payments and access to available resources;

–management of evaluations, grades, certifications.

f) ***extracurricular environment***:

– dynamics of the virtual campus;

– useful information: scholarships, accommodation, meals, transport, leisure opportunities, entertainment, etc.

The virtualization process is in continuous transformation, new instances being able to appear and condition the contemporary educational processes, both the formal ones and the optional or incidental ones. Information technologies are growing exponentially and will surprise us with new means to which education will have to adapt.

But the virtualization of education has both positive and negative aspects, compared to traditional education or correspondence training. We present some of them in the table below (Cucoş, 2006):

Table 1
Virtualization of education

Stages	Strengths	Weaknesses
Traditional education	Pedagogical follow-up and supervision is mandatory	There are no teaching routes explicitly adapted to students. Motivation is achieved through coercion. Working is solitary.
Correspondence training	The student works at home.	Surveillance is not mandatory. Motivation is extrinsic, due to the relatively high costs. Working is solitary. There is no adaptation to the student.
Computer-assisted training	The students work in their natural place of existence. Activities are adapted to the student's needs.	Surveillance is not mandatory. Motivation is delivered through costs. Working is solitary and tributary to technology.
E-learning	Pursuing the maximum individualization of the formative path. Students work at their usual place. The content is adapted to the students' needs. Teamwork.	Tribute to the latest technology

Comparing the traditional education with the informational, computer-assisted one, we notice the specific differences of between traditional education and the student-centered education:

– teacher-centered vs. student-centered (main actor)

– static vs. dynamic (movement, change, search)
– passive vs. active (action)
– individual vs. group (interactive and collaborative)
– extrinsically motivated vs. intrinsically motivated (need for knowledge)
– directed vs. autonomous (with self-propulsion, self-management)
– based on memorization vs. based on the searching, processing and personal rendering of information
– reproductive vs. creative (production of the new)
– standardization vs. individualization and differentiation of learning

Regarding the computer functionalities in school, several instances can be highlighted (cf. Hadzilacos, 2005):

1. The computer as a means of recording expressions, such as the board, sheet of paper containing lines, shapes, colours In this sense, the computer has the following uses: a) **unlimited storage** capacity for all kinds of information; b) capacity for **infinite modification**, addition and reconfiguration; c) **multiple combinatorics** of the modes of expression (through text, symbolism, graphic aspect, colour); d) great possibility to choose **different work tools** (dictionaries, encyclopedias, specialized web pages, databases, ways of word processing or visualization, etc.).

2. The computer is a means of construction and modelling Just like with paper and a pencil, with the computer you can do many things, becoming a real *investigation laboratory*. It combines several ways related to knowledge, being able to store ideas, theories, or illustrate or concretize abstract data, imitating objects and functions, simulating certain aspects of reality (*how grass grows, how a bird or a plane flies, how an atomic bomb explodes,* etc. .);

3. The computer becomes an excellent *means of experimentation* in the school environment. In front of the computer, the child can discover the world, bring it closer and rearrange it according to his needs and goals.

4. The network-integrated computer has the role of *means of communication* and externalization in the school environment. It becomes a window of opening (informational, emotional) to those in the near or even distant environment.

5. The computer acts as *a programming device*. Through it, you perform certain projective operations, you establish an order and a sequence of operational sequences.

In this way students make progress by learning how to use the capabilities of the computer but also by differentiating themselves from it through creativity. Because the computer provides them with an exceptional informational memory, multiple combinatorics, different work tools, the student will have to develop his applicative, instrumental skills but also those complementary to the computer, especially the creative skills.

Cyberculture, "the techniques (material and intellectual), practices, attitudes, modes of thinking and values that grow with the development of cyberspace" (Lévy, 1997) is a synthesizing concept of the current cybernetic movement. But cyberculture, as an aspect of current globalization, has certain negative tendencies (Cucoş, 2006):

– the proliferation of *mass culture* to the detriment of "high" quality culture,

– *hedonism and consumerism* based on the satisfaction of pleasure and the need for consumption are considered the principles of this culture;

– areas of *scholarly and common knowledge,* cultured and folkloric expression that are far too different and that have developed separately, are mixed;

– *cultural discrimination* of certain cultural perimeters to the detriment of others;

– the *relativity of the values* through which the taste of uncertainty and ideational, ideological, cultural paradoxes is cultivated;

– an individualistic culture is cultivated in accordance with the preferences of the public.

Gardner (2006) showed that *the current knowledge society* has certain dysfunctions that can be solved by the creative reconsideration of education:

– the *"super-westernization"* which excessively promotes Western values to the detriment of other values and which can be corrected by knowing cultural values and promoting them in a balanced way.

– *"supertesting"* which results in an excess of verification, labelling and ranking can be corrected by developing a policy for students' development of according to their particularities,

– *"super-excellence",* which cannot be the only educational model in a diverse society of knowledge, can be complemented by promoting multiple educational models.

In conclusion, young people are both the beneficiaries of the knowledge society, focused on the student, and especially the builders of an open, cyber, creative society.

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ÎNVĂŢAREA LA TINERI. SPECIFICUL EI ŞI PROVOCĂRILE
SOCIETĂŢII CUNOAŞTERII

(Rezumat)

În introducerea lucrării este definită societatea cunoaşterii din perspectiva mai multor autori şi se schiţează personalitatea digitală, ca un nou tip de personalitate specifică tinerilor, formată sub dominaţia calculatorului. În a doua parte a lucrării se discută învăţarea constructivistă, în sistemul de educaţie centrat pe elev-student, atitudinile profesorului-constructivist, formatoare de atitudini creative ale elevului şi studentului constructivist. Partea a treia a articolului abordează învăţarea tinerilor în mediul virtual, procesul virtualizării educaţiei cu actorii, noile conţinuturi, metode, mijloace, forme de organizare a educaţiei, aspectele pozitive dar şi negative ale educatiei virtuale. În finalul lucrării se face trimitere la cibercultură ca un concept sintetizator al actualei mişcări cibernetice.

STUDY ON IMPROVING FRESHMEN'S SKILL THROUGH MEANS AND METHODS SPECIFIC TO VOLLEYBALL

BY

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Abstract. Physical education and sports have a complex set of activities organized for the purpose of fortification, compensation, relaxation and recreation, nowadays experiencing an increasing expansion. Skill is a very important motor quality, present more or less in all motor acts, especially those of a sporting nature. Often the skill has a decisive role in the realization with a high efficiency, of some technical-tactical procedures from most of the sports branches. Therefore, starting from the premise that the skill – motor quality – is basic in learning and practicing volleyball, we set out to select and verify a system of means specific to volleyball, with the purpose of training it. A support of this motivation is the fact that freshmen have a special enthusiasm for the dynamic games that concern the development of the skill.

Keywords: abilities coordination; development; games; enthusiasm.

1. Introduction

Volleyball is able to mobilize all forces, to keep students' interest awake, to achieve maximum efficiency.

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The importance of playing volleyball as a way of mental disconnection should also be emphasized.

Although the research carried out so far has failed to elucidate all the essential aspects of the skill, the methodology has some data, sufficiently fundamented from a scientific point of view, which can be used as benchmarks in assessing and developing this quality (Ştirbu, 2010).

The indications by which the skill can be appreciated are:

– the degree of complexity of the action;

– execution accuracy;

– execution time;

Skill control can be assessed by:

– finding if the student has skill, if he executes coordinated, harmonious, graceful movements.

– comparing with another student who would have considered a benchmark in the value scale.

The use of exercises for the development of skill must be done on a general background, with the establishment of the optimal time for the complete recovery of the body, ensuring the conscious and creative participation of students in the effective development of the game (Alexe, 1993).

Very important is the positive influence of sports games motor skills. They influence the development of motor qualities both in their general and specific aspect. Of particular note is the development of skill (based on speed and coordination, located especially in the segments with which the ball is handled) (Scarlat and Dragomir, 2004).

By playing volleyball, we pursue the following objectives:

– mastering the basic procedures of passing, setting, serving, attacking, blocking;

– initiation into the game with small or normal numbers;

– knowledge of the rules of the game.

Because the objectives are related to the objectives of physical education, and the form of organization is the physical education lesson, we consider the first "moment" of the training activity the one in which the student comes in contact with the game of volleyball. In this stage, many exercises and games with the ball are used, but not only, to get students used to it, especially in order to improve their skills (Mitra and Mogoş, 1980).

From the multitude of existing means, for the development of the skill we chose exercises and exercise complexes, which are attractive for students, but also very effective (Baranga and Mujicicov, 1996; Epuranu, 1973).

The ways that are used to improve skill are:

– games for getting used to the ball;

– preparatory games for the development of the ability to move on the field and to stop in a fundamental position;

– exercises and games for developing the ability to take the ball with both hands up and down;

– exercises and games for developing the skills of the lower front service;

– exercises and games for developing the ability to attack;

– exercises and games for developing the ability to perform the blockage;

– circuits for technical training;

– relays and preparatory games (Scarlat, 1981; Scarlat and Scarlat, 2002).

2. Research Hypothesis

The study aims to prove the following:

• if through the methods introduced in the research, there is an improvement of the motor quality skill;

• whether the development of the skill at this age category can be influenced (first-year university students at technical faculties);

The program of physical education at the non-profile faculties provides for the teaching of sports games, along with other activities such as athletics and gymnastics. The establishment of sports branches as superior organized forms of physical exercise was a big step forward. They have significantly enriched the possibility of multilateral manifestation of students' skills and talents.

Very important is the positive influence of sports games on motor skills. They influence the development of motor qualities both in their general and specific aspect. Of a particular note is the development of skill (based on speed and coordination, located especially in the segments with which the ball is handled).

The study aims to experiment with a system of optimal ways, in order to improve the skill in the game of volleyball at the level of freshmen, during the academic year 2019 - 2020.

Establishing the sample included in the research:

– as the study aims to improve skills at the university level, the experiment was conducted with freshmen, mixed groups of male and female students.

The following control samples were given for the initial and final tests:

1. Shuttle 5 x 5 m.

A distance of 5 m is established. At the signal, the performer starts from the starting line with a cone in his hand which he places in a circle drawn at a distance of 5 m. He turns and takes another cone from the starting line, runs, circles it, transporting each of the three cones in the same way. When the last cone is placed in a circle, the timer stops.

2. Control pass over the head.

The control pass is performed over the head, with two hands, at maximum speed for 30 seconds. The result recorded is the number of passes.

3. Lower front serves at fixed point.

The lower front serve is performed with one hand, on the wall, at a distance of 3 m from it, in a square with a side of 0.5 m, at a height of 1.5 m. The result recorded is the number of successful attempts out of ten.

Following the initial and final tests, we obtained the following results:

Table 1
GROUP A

No.	Name	Shuttle 5 x 5 m		Control pass over the head		Lower front serves at fixed point	
		T. I.	T.F.	T. I.	T.F.	T. I.	T.F.
MEN							
1.	AL	11.2	10.8	10	21	6	9
2.	AN	10.1	9.8	18	25	5	9
3.	BP	11.5	10.8	19	24	5	8
4.	BC	10.4	9.9	25	32	10	10
5.	CI	11.0	10.7	13	20	5	8
6.	IL	13.4	12.5	7	17	6	7
7.	LD	12.8	12.3	5	18	7	8
8.	MS	11.9	11.2	11	22	5	7
9.	NP	12.0	11.6	5	18	3	7
10.	PO	11.9	11.3	19	25	5	8
11.	ST	9.3	9.2	24	31	4	10
12.	SS	11.0	10.6	13	24	8	9
13.	SC	11.2	10.8	12	21	3	6
14.	VI	13.5	12.6	12	24	9	9
15.	ZL	10.2	10.0	20	29	5	8
	x	11.42	10.94	14.2	23.4	5.73	8.2
	S	1.15	0.97	6.15	4.42	1.94	1.1
	V	10.08%	8.89%	43.30%	18.88%	33.85%	13.41%

	WOMEN					
1.	BC	12.0	11.7	9	18	2	6
2.	GL	12.5	12.2	10	21	5	8
3.	LS	12.4	12.0	11	19	7	7
4.	LC	11.3	11.1	7	18	6	8
5.	MA	11.5	11.0	11	22	5	8
6.	NR	12.3	11.6	9	20	6	7
7.	RC	12.8	12.1	15	26	3	5
8.	RS	11.0	10.4	16	29	4	8
9.	SL	11.5	10.9	11	23	7	9
10.	VO	12.4	11.8	9	18	9	10
	x	11.97	11.48	10,7	21.4	5.4	7.6
	S	0.57	0.56	2.63	3.52	1.95	1.35
	V	4.87%	4.76%	24.35%	16.44%	36.11%	17.76%

Table 2
GROUP B

No.	Name	Shuttle 5 x 5 m		Control pass over the head		Lower front serves at fixed point	
		T. I.	**T.F.**	**T. I.**	**T.F.**	**T. I.**	**T.F.**
	MEN						
1.	BC	11.2	10.9	19	25	6	8
2.	CI	9.2	9.0	24	33	7	10
3.	CC	9.5	9.5	27	35	8	10
4.	DA	12.3	12.1	14	24	4	6
5.	DV	10.9	10.5	12	27	7	9
6.	FI	11.2	10.8	13	24	8	8
7.	GM	10.2	9.9	21	29	5	8
8.	IA	10.4	10.3	20	28	3	7
9.	LI	9.6	9.3	28	35	9	10

10.	MR	10.9	10.1	25	31	7	9
11.	VT	10.1	9.8	23	27	7	9
	x	10.5	10.2	20.54	28.90	6.45	8.54
	S	0.86	0.82	5.31	3.89	1.71	1.23
	V	8.19%	8.03%	25.85%	13.46%	26.51%	14.4%
WOMEN							
1.	AA	10.3	10.0	11	23	5	9
2.	BV	10.3	9.9	13	25	3	6
3.	BC	11.4	11.3	21	30	6	7
4.	CS	10.3	10.1	19	27	5	8
5.	CI	11.0	10.5	23	30	8	10
6.	CA	12.5	11.9	11	24	3	6
7.	CS	11.3	10.8	18	27	3	7
8.	DI	11.3	11.2	13	26	4	6
9.	EA	12.2	11.6	19	25	5	8
10.	IR	11.4	11.1	13	21	7	8
11.	MO	11.9	11.4	19	28	7	9
12.	PO	13.1	12.9	8	19	5	7
	x	11.41	11.05	15.6	25.41	5.08	7.58
	S	0.85	0.83	4.51	3.19	1.6	1.25
	V	7.45%	7.51%	28.79%	12.55%	31.49%	16.49%

Comparing the results of the initial and final tests for the three tests - the 5 x 5 m shuttle, the control pass over the head and the fixed point serves, the following groups of students can be seen as follows:

– in group A men, in the shuttle test 5 x 5 m, calculating the arithmetic mean both in the initial test and in the final test the progress made by the students was 0.46. The standard deviation for the final test of 0.97 and the coefficient of variability of 8.89%. All these results indicate that the means used during the experiment were well selected, the exercise having an important role, which led to the team in the first values, yet the coefficient of variability is between 0-15%, so that the measured sample it is homogeneous, meaning that the data spread is very small. In the test pass control over the head, the results

show that in this test, somewhat difficult due to the work "from the fingers", the students made a progress of 9.2, the coefficient of variability in the final test being 18.88%, thus between 15 - 30%, which means that the data spread is medium, the average is still sufficiently representative. In the test of the serve at the fixed point, the results show that the students made a progress of 2.47 and the coefficient of variability decreased from 33.85% (where at that time the team was lacking in homogeneity) to 13.41%, which shows that the sample is very homogeneous.

– in group A women, the results indicate that the students in this class also progressed. In the shuttle test 5 x 5 m, the progress being 0.49, the coefficient of variability in the final test being 4.87%, which means that the sample is between 0 - 15%, so the group is very homogeneous. In the overhead test samples and the serve at the bottom at a fixed point, the coefficient of variability is between 15 - 30%, which means that the sample is still sufficiently representative.

– in group B men, in the shuttle test 5 x 5 m, the progress was 0.3, the standard deviation in the final test of 0.82 and the coefficient of variability of 8.03%. These results indicate that the boys were between 0 - 15%, which means that the group is very homogeneous. In the tests of control over the head and the serve below at a fixed point, the percentages of the coefficient of variability of 13.46% and 14.40%, respectively, show that here too, the team is very homogeneous and the data spread is very small.

– in group B women, the results indicate that they have progressed. In the 5 x 5 m shuttle test, as well as in the control pass test above the head, the coefficient of variability at the final test was between 0 - 15%, which means that the sample is very homogeneous and the data scattering is very small. In the sample of the serve at the bottom at a fixed point, the coefficient of variability is 16.49%, which means that the sample is still sufficiently representative.

3. Conclusions

The results of the research carried out in the academic year 2019 - 2020 at the "Gheoghe Asachi" Technical University of Iaşi regarding the improvement of the freshmen's skill allow the formulation of the following conclusions:

• Through the ways and methods used in research, an improvement of motor quality was found – skill.

• Development of motor quality - skill by ways used does not harm physical training as a whole, but on the contrary, these ways form skills that can help in the future to acquire other more complex motor actions.

• Singular exercise of motor quality is not recommended - skill, not taking into account the development of other motor qualities, at this age, because during this period a multilateral training must be performed.

The results of the research from which we drew the above conclusions allow us to formulate the following recommendations:

1. Within the physical training a selection of the most effective ways and methods must be made.

2. The use of the most diverse means, so that the physical activity is as abstract as possible and to arouse the students' interest. With their interested participation, the actual working time can be increased, by avoiding "dead" times and a greater degree of progress can be reached.

3. Adaptation of the exercise means by their corresponding dosage:
• depending on the individual capacity for effort;
• depending on age;
• by sex.

4. The use of the means that can offer the teacher has the possibility to observe, as much as possible, the activity of each student, having the possibility to correct their actions or to readjust their means according to the capacity of each one.

5. The use of speed means for the development of the skill, because this quality positively influences the skill.

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STUDIU PRIVIND ÎMBUNĂTĂŢIREA ÎNDEMÂNĂRII PRIN MIJLOACE ŞI METODE SPECIFICE VOLEIULUI LA STUDENŢII DIN ANUL I

(Rezumat)

Educaţia fizică şi sportul dispun de un ansamblu complex de activităţi organizate în scop de fortificare, compensare, destindere şi agrement, cunoscând în zilele noastre o extindere din ce în ce mai mare. Îndemânarea este o calitate motrică foarte importantă, prezentă mai mult sau mai puţin în toate actele motrice, mai ales ale

acelora cu caracter sportiv. Adesea îndemânarea are un rol hotărâtor în realizarea cu un randament ridicat, a unor procedee tehnico-tactice din majoritatea ramurilor sportive. Aşadar, pornind de la premisa că îndemânarea – calitate motrică – este de bază în însuşirea şi practicarea jocului de volei, ne-am propus să selecţionăm şi să verificăm un sistem de mijloace specifice voleiului, în direcţia educării ei. Un suport al acestei motivaţii este şi faptul că studenţii din anul I au un entuziasm deosebit pentru jocurile dinamice care privesc dezvoltarea îndemânării.

STUDY OF THE USE OF MEANS TO PREVENT INJURIES IN VOLLEYBALL

BY

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Abstract. Injuries are part of the performance sports activity, and therefore also in volleyball; however, they can be prevented, most of the time by special measures that can reduce the risk of their occurrence. The components of the body that are most prone to injury are the soft tissues (muscles, tendons, ligaments, cartilage) and the skeletal system. A large part of injuries occurs as a result of the supramaximal efforts of players who want to exceed their limits or improve their physical condition.

Keywords: performance; sport; recovery; muscles; effort.

1. Introduction

Volleyball, through its characteristics, is a sport of confrontation and risk. Many athletes are impacted by injuries during their careers. They influence well-being physically, socially and emotionally (Ştirbu and Puni, 2009).

Pain and suffering are normal in the life of an athlete. They can be frustrating and threatening, but are generally accepted as a condition of "play".

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Injuries fall into the category of accidental, unpredictable phenomena, which often occur due to external factors that have the effect of interruption, cessation of sports, mutilation and even death (Avramescu (Rinderu), 2006).

In volleyball, teams rarely come into direct contact, the injuries being caused by complex technical procedures such as blockage, recovery of the ball by diving, muscle fatigue, contact between teammates, etc.

The basis of sports performance is the adaptation of the body to the effort and demands of training. Athlete training is currently a complex science.

In order to increase sports performance, an adequate diet for the body's needs, medication, adequate physical and mental recovery as well as ways of prevention and postural recovery must be adopted (Bota, 2000).

The old and well-known finding that it is easier to prevent than to treat is also perfectly valid in sports injuries, especially since in volleyball an injury has repercussions not only on the affected player, but also on team performance.

The dynamism of volleyball demands a lot of the muscular chains of the trunk and limbs.

2. Research Hypothesis

In volleyball, the performances improve from one year to another so that they represent a limiting psychomotor activity, requiring from the players a maximum effort of speed, strength, endurance, ability to concentrate under stress. Therefore, the risk of injury and illness of the athlete also increases, precisely due to the intense demands, close to the functional limits of the body. In this context, the preventive activity of detecting the causes and mechanisms of accidents appears to be fundamental (active prevention aims at obtaining the state of sports "vitality").

In the prophylaxis of traumas, it is also essential to know the determining or favoring factors of some injuries that can also be counteracted (external factors: unfavorable environmental conditions, collisions, gearing in bumps, inadequate playing surface; internal factors: hypocalcemia, local irrigation disorders, incompletely resolved previous trauma, avitaminosis, unsportsmanlike life, other diseases, fatigue, overtraining) (Bahr and Krosshaug, 2005).

There was a direct link between the frequency and nature of accidents on the one hand and training methods on the other. This fact led to the conclusion that the appearance of a series of changes in these training methods and the addition in the training process of the methods of joint gymnastics, massage, stretching, gymnastics for increasing muscle strength, injury prevention training would substantially reduce overload injuries (Gornea, 2010).

Knowing the causes or factors that favor the occurrence of sports injuries as well as understanding the mechanisms underlying their production, is of particular importance not only for the correct specification of the diagnosis but

especially for identifying measures to prevent the possibility of their occurrence (Avramescu and Ilinca, 2007).

Risk factors are classically divided into two broad categories: internal or intrinsically-related to sports and external or extrinsic-related to environmental factors (Drăgan, 2002). It is important to note that these risk factors can be divided into modifiable and non-modifiable factors. Although non-modifiable risk factors such as gender and age may be of interest, the study of potentially modifiable risk factors through training is more important. However, the simple identification of these internal and external factors, in the case of sports trauma, is not enough because sports injuries result from a complex interaction of multiple risk factors and situations of which only a small part have been identified. Theoretically, three quarters of accidents are caused by a clear etiological factor, and a quarter by other factors (Schafle, 1993).

However, the accident is often the result of an accumulation of variables. Although attempts have been made to examine several of these variables, it is possible that other factors such as experience, technique, style of play or personality may also be causes that explain injuries other than those described as having known causes.

We assume that good information for athletes on injury prevention methods and careful coordination in the use of these methods can reduce the incidence of volleyball-specific injuries.

In this research we aimed to highlight the importance of using preventive methods in the game of volleyball, and how they can reduce the frequency of injuries. We also identified the types of injuries and the causes that lead to them.

The study aims to raise awareness among athletes about the importance of preventive methods and the implementation of specific prevention programs for specific injuries.

The study addressed a sample of 70 people, the selection criterion being represented by the practice of volleyball at different levels of performance and examined the way in which the observance or non-observance of prevention methods can influence sports performance.

1. Level of performance

Amateur – 24.3%
Semiprofessional – 28.6%
Professional – 47.1%

The level of performance is an important factor because the performance activity creates a framework conducive to overtraining injuries. While at the amateur level injuries can occur as a result of lack of training or non-compliance with a training program, the sport being practiced occasionally.

2. Position in the team

The position held in the volleyball team can be a determining factor for the frequency of injuries and their location. Most of the interviewees played in the outside hitter position, a position that requires a lot of the upper train but also the lower one due to the actions of jumping, blocking and the attacking action.

Another significant majority is the universal position which undertakes both offensive and defensive actions.

The minority is represented by libero.

Setter – 15.7%
Middle blocker – 17.1%
Outside hitter – 31.4%
Opposite hitter – 27.1%
Libero – 8.6%

3. Number of weekly training hours

4-10 hours – 37.1%
10-20 hours – 45.7%
Over 20 hours – 17.1%

Most of the answers correspond to athletes who regularly practice between 10-20 hours a week. The number of training hours is an important index in identifying the frequency of injuries.

4. Personally, what kind of injuries have you encountered the most frequently so far?

Sprain – 53 - 75.7%
Muscle and ligament stretches – 29 - 41.4%
Tendinitis – 11 - 15.7%
Subluxations – 6 - 8.6%
Fractures – 3 - 4.3%
No injury – 3 - 4.3%

Out of the total number of interviewed athletes, more than half suffered sprain injuries. Sprain is due to the increased number of jumps that lead to joint overload and ligament laxity. Sometimes it can also occur due to sudden changes of direction or in other cases when landing on the foot of another teammate or opposing player. This is one of the reasons for the high frequency of sprains among volleyball players.

The second predominant response is stretching, muscle tears and ligament tears, which are often caused by overuse.

5. Were you officially informed about the injury prevention methods within the team?

Yes – 50 - 71.4%
No – 20 - 28.6%

Statistics show that out of a total of 70 athletes, approximately 71.4% of volleyball players were officially informed about methods of injury prevention. This indicates that both the coach and the physiotherapist were aware of the importance of injury prevention.

6. Have you personally informed yourself about how to prevent injuries?

Yes – 58 - 82.9%
No – 12 - 17.1%

The 82.9% percentage reveals that volleyball players are aware of the importance of prevention exercises and the need to perform them correctly, the responsibility being shared on both the volleyball player and the coach.

7. Did you use volleyball-specific injury prevention programs during your training?

Yes – 59 - 84.3%
No – 11 - 15.7%

Through the above statistics we can understand that a good prevention program executed correctly and related to each training has a positive impact on the volleyball player. The vast majority of volleyball players run an injury prevention program at every training session.

8. Which of the following prevention methods did you use?

Stretching – 67 - 95.7%
Plyometrics – 17 - 24.3%
Core stability – 16 - 22.9%
Tapping and strapping – 15 - 21.4%
Recovery – 13 - 18.6%
Exercises with weights – 3 - 4.2%

From these results we deduce that the most commonly used prevention methods are stretching, plyometric exercises, core stability, tapping and strapping, guided recovery. Out of these, the most used method (a percentage of

95.7%) is stretching, a relevant and worrying fact because an effective preventive program includes several methods that adapt the body more to the effort or demands of the game.

9. How many times have you used them?

Each training sessions – 81.4%
Occasional – 15.7%
Others – 2.9%

This statistic provides confirmation that regular prevention exercises are used at each workout. Only 15% said they used these prevention programs occasionally.

10. At what part of training?

Before training – 42.9%
After training – 2.8%
Both – 54.3%

54.3% of those surveyed answered that they practice exercises to prevent injuries both before and after training, while 42.9% only post-training. This is relevant because pre-workout prevention exercises adapt the body to the demands, and post-workout exercises prevent fatigue and facilitate body recovery.

11. During the prevention methods, were you supervised and coordinated by the physiotherapist / coach?

Yes – 37 - 52.9%
No – 33 - 47.1%

There is an almost equal percentage of answers, which reveals the importance of knowledge of prophylaxis exercises both by coaches and especially by players.

12. How important do you consider the methods of prevention in volleyball?

Indispensable – 57.1%
Significant – 42.9%
Insignificant – 0%

From their own personal experience, 57.1% of the surveyed players deduced that prevention exercises are indispensable and 42.9% that they are important. This index is relevant because it shows the particular importance that a volleyball player attaches to prevention methods.

3. Conclusions

Injury prevention methods must be a foundation in the organization of sports training because they have a decisive role in achieving high performance where every detail matters, but also at the amateur or semi-professional level. Each workout should include specific exercises to prevent injuries with the highest frequency, and the results will not be long in coming.

Following the study we can conclude that the level of information on prevention methods is quite high, but we can not specify how correctly these methods were performed. Also, based on the data, we identified the most frequent injuries, a percentage that largely coincides with that in the literature.

Another conclusion is that players understand the importance of injury prophylaxis, but it is worrying that the most selected option of prevention was stretching (95%), the other methods having significantly lower percentages, which is far from sufficient for a program of effective prevention.

Unfortunately, in Romania there are few specialized studies regarding sports injuries and these are not based on the intervention of specific programs for the prevention of common injuries in volleyball and sports training.

There are currently no strict prevention protocols on the pathology with the highest incidence. Most prevention programs are based strictly on stretching exercises introduced during the warm-up / recovery period after exercise or aimed at the general physical training of the athlete.

The aim is to optimize the strategy for the prevention (prophylaxis) of sports injuries by introducing in the athletes' training or volleyball training as many exercise programs for prophylactic or injury prevention purposes, as well as other methods of recovery.

We believe that this area of injury prevention specific to volleyball needs to be further studied and deepened in order to perform, because athletes need optimal conditions for injury prevention and recovery.

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STUDIU PRIVIND UTILIZAREA MIJLOACELOR DE PREVENIRE A ACCIDENTĂRILOR ÎN JOCUL DE VOLEI

(Rezumat)

Accidentările sunt parte din activitatea sportivă de performanţă, deci şi în jocul de volei, dar se pot preveni, de cele mai multe ori prin măsuri speciale, care pot reduce riscul producerii acestora. Componentele corpului care sunt cele mai predispuse accidentărilor sunt ţesuturile moi (muşchi, tendoane, ligamente, cartilaje) şi sistemul osos. O mare parte a accidentărilor survin în urma eforturilor supramaximale ale jucătorilor, care doresc să îşi depăşească limitele sau să îşi îmbunătăţească performanţele sportive.

A PEDAGOGICAL APPROACH OF MACHINE LEARNING AND NEURAL COMPUTATION

BY

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Abstract. Teaching and learning certain technical subjects might be a challenge for both professors and students. This paper describes a methodology of instruction with examples in the field of machine learning and neural computation that could bring higher achievements and results in the teaching-learning-evaluation process. The model offers a foundation and framework upon which to build a teaching framework that will help professors to use specific pedagogical methodologies that – further on – might improve student achievement in the Artificial Intelligence field. The model described refers to the Taxonomy of Educational Objectives, proposed initially by Benjamin Bloom. The model is a way to classify instructional activities as they progress developmentally through six incremental levels: knowledge through memorization, understanding, application, analysis, evaluation, and creativity.

Keywords: machine learning; educational objectives; Bloom's taxonomy; instruction.

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1. Machine Learning

Today machine learning elements are used in many areas. For instance, the self-driving car has been developed using machine learning theory. Machine learning defines the way in which humans can make programmable machines behave in a certain way without being explicitly programmed. In other words, machine learning is the scientific study of algorithms that computer systems use to perform a specific task without using a whole load of instructions, relying on data training, patterns, triangularisation and inference instead. Closely related to computational statistics, machine learning is often seen as an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience. However, artificial intelligence research employed logical, knowledge-based approaches, in constrast to machine learning, which used algorithms. Nowadays, machine learning focuses on the development of computer programs that can access data and use it to learn for themselves, and the concept includes a large number of researchers and technicians who, through reorganization, gained their own field of study.

It is Arthur Samuel (Foote, 2019) from IBM who first came up with the phrase "Machine Learning" in 1952 based on his alpha-beta pruning concept. Five years later, Frank Rosenblatt – a research psychologist at the Cornell Aeronautical Laboratory – combined Donald Hebb's model of brain cell interaction with Arthur Samuel's Machine Learning efforts to create the "perceptron", which was initially intended to be a machine, not a program (Lee *et al.*, 2017).

Translating Hebb's concepts to artificial neural networks and artificial neurons (Hebb, 2002), it is possible to describe this model as a way of altering the relationships between artificial neurons (nodes) and the changes to individual neurons. More specifically, if two nodes are activated at the same time, the relationship between them strengthens; conversely, if they are activated separately, the relationship weakens. The term emplyed to describe these relationships is "weight". Nodes that tend to be both positive or both negative have strong positive weights, while those nodes tending to have opposite weights develop strong negative weights.

Machine learning algorithms are used in a wide variety of applications, such as email filtering, data mining, text understanding (like web search, anti-spam tools), practical speech recognition, effective web search, medical informatics, audio, building smart robots (their perception and control), the human genome, computer vision, facial recognition, analytical tools, gaming and other areas, and wherever else it is difficult to develop a conventional algorithm for effectively performing the task. Today, the world of business **uses** machine learning in seven common ways (Foote, 2019): Analysing Sales Data,

Real-Time Mobile Personalization, Fraud Detection, Product Recommendations, Learning Management Systems, Dynamic Prices, Natural Language Processing.

2. The Benjamin Bloom Taxonomy

Bloom's taxonomy is used to group learning objectives into different levels, from affective, sensorial and cognitive fields. The last domain has six levels of objectives (Pappas *et al.*, 2013; Heer, 2015; Stanciu and Ilieş, 2020): Remember, Understand, Apply, Analyses, Evaluate, Create (Fig. 1).
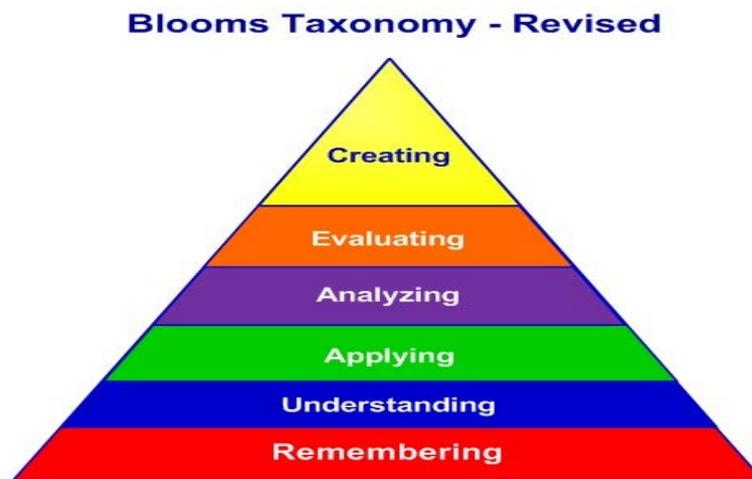
Fig. 1 – Bloom's taxonomy.

Knowledge (by remembering)
The knowledge level involves remembering primary concepts, as shown in examples below.
Examples:
Example 1: *Name the components of a biological neurons*
Possible answer: Dendrite, nucleus, soma, myelin sheath, node of Ranvier, collaterals, axon terminal …
Example 2: *Name the fathers of machine learning concept and their contribution to the field*
Possible answer: Alan Turing – The founder of the Turing test, one of the most important milestones in modern computing, test which is nowadays used against powerful machine learning algorithms to prove they are Turing complete therefore can solve any human related issue. (No algorithm has passed this test yet)
Stewart Russell – The co-author of one of the most important books for the AI field (*Artificial Intelligence: A Modern Approach*). He has brought great

contributions to the AI field with his research on probabilistic reasoning, knowledge representation, computer vision, inverse reinforcement learning. He has been a major contributor to the advancement of machine learning into the nowadays world and has founded the Centre for Human Compatible Artificial Intelligence at UC Berkley.

Comprehension (Understanding)
Comprehension involves understanding of main ideas.
Examples:
- Interpretation
How do you interpret the following figure?
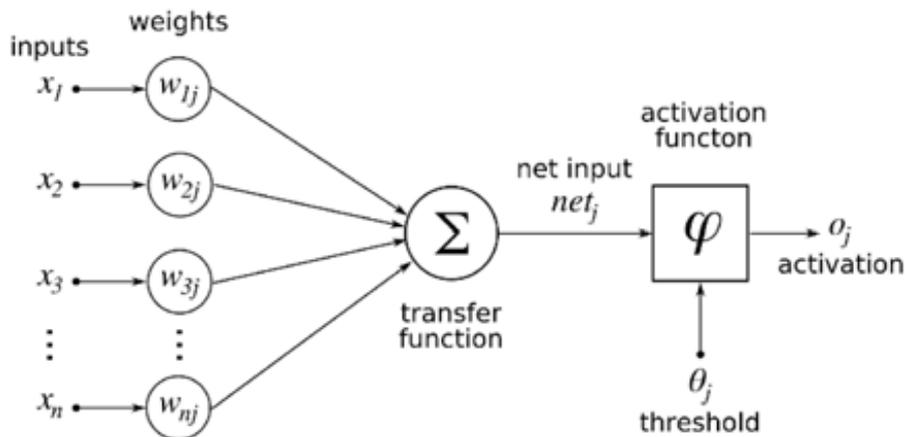
Fig. 2 – A single artificial neuron (Lee and Almond, 2003).

Possible answer: The inputs represent the data that is fed into the artificial neuron, these can be binary or real valued, the weights are modelling the biological neuron strengths (and they are real valued), the transfer function is a monotonically increasing differentiable function which is applied to the sum of the weighted inputs to give the activation a in the range of 0 to 1 which is then the threshold to output of the neuron (whether it fires or not). If a is bigger than the threshold then the neuron 'fires', otherwise it doesn't fire and we adjust the weights until we get our desired output.

- Exemplification
Find an example of the use of an artificial neuron in use.
Possible answer: Identify a cat or a dog from a given set of images. This can be done by acquiring a set of features that are specific to the class of either dogs or cats (for example: dogs have a bigger nose than cats).

- Classification

Given a set of data with biological features and symptoms of people that are diagnosed with cancer, identify whether a person is susceptible or has cancer.

Possible answer: We use the features as inputs to a TLU (Threshold Logic Unit) and learn the correct classification by comparing each of the feature values provided by the patient to the historical values of those features provided by people that have cancer.

- Summarizing

Summarize how the decision tree learning algorithm works.

Possible answer: The decision tree algorithm works in three ways:

1. Splitting – the process of splitting the dataset into multiple subsets. The splits are performed on a particular variable. (example: split by gender)

2. Pruning – This process reduces the size of the decision tree by turning branched nodes into leaf nodes (nodes that have children in nodes without children) and removing the leaf nodes under the branched nodes.

3. Tree selection – the process of finding the tree with the least nodes that fits the data.

- Deduction

Identify the most important features of a given set of data to come up with a classification model.

- Comparison

Compare the Regression algorithm to the Randomised Forrest Algorithm.

- Explanation

Explain the concept of Machine Learning.

Application

The application is related to the use of a learned concepts in new situation.

Examples:

- Execution

Generate the successors of the leaf-node that has the highest cost path.

A: Draw the diagram of an A* search

- Implementation

Design a neural network to see how it behaves.

Analysis

The analysis consists of distinguishing different parts and the general structure.

Example:

Identify important information in a Machine Learning article and **extract** *the important information.*

Evaluation

The evaluation includes judgments of the content.

Example:

Assess the validity of the arguments for and against Artificial Intelligence.

Creation

This objective ask**s** the learner to do something new, based on the already learned concepts.

Example:

Plan a scientific study to test the effect of machine learning on pedagogical achievements.

3. Conclusion

The proposed taxonomy is used to emphasis different levels (*Taxonomia lui Bloom*, 2020) of human cognitive process. The goal of using Bloom's taxonomy is to encourage higher-order thoughts in students (Wilson, 2020) and multiple intelligence (Rule and Lord, 2003) by building up from lower to higher-level cognitive skills because the thinking skills are hierarchical, and students must master content at each level.

In the examples above, behavioural and cognitive learning outcomes are given to highlight how Bloom's taxonomy can be incorporated into larger-scale engineering educational goals. By using Bloom's approach, students move through six levels of development: knowledge, comprehension, application, analysis, evaluation, and creativity. The benefits of using Bloom's Taxonomy, especially in engineering subjects, is that the professors are able to create appropriate activities, are able to develop relevant instructional strategies and they are able to review whether both the instruction and the evaluations are consistent with the learning objectives.

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O ABORDARE PEDAGOGICĂ A ÎNVĂŢĂRII AUTOMATE ŞI A CALCULULUI NEURAL

(Rezumat)

Predarea anumitor discipline – în special a celor tehnice – ar putea fi o provocare atât pentru profesori, cât şi pentru studenţi. Această lucrare descrie o metodologie de instruire cu exemple din domeniul învăţării automate şi a calculului neuronal, abordare pedagogică care ar putea aduce realizări şi rezultate mai mari. Modelul oferă o bază pedagogică pe care să se construiască un cadru didactic care să îi ajute pe profesori să utilizeze metodologii specific, care ar putea îmbunătăţi performanţa studenţilor în domeniul inteligenţei artificiale. Modelul descris în această lucrare foloseşte taxonomia revizuită a obiectivelor educaţionale a lui Bloom, ca modalitate de a clasifica activităţile de instruire pe măsură ce acestea progresează pe parcursul a şase niveluri successive.

ARGUMENTS FOR THE VOCATIONAL TRAINING OF TEACHING STAFF IN LOWER SECONDARY EDUCATION

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Abstract. The present study draws attention to the possible link between the quality of teaching staff in the lower secondary education system and the results of students. In this sense, the national and international exams public results are presented in parallel, namely the National Assessment at the end of the 7th grade, the PISA test and the Baccalaureate, respectively the National Tenure Exam for Teachers. The findings show some similarities between the results of students and teachers in general. The analysis of teacher results shows that Bachelor studies' programs for teacher training provide better results than the optional psycho-pedagogical training program; teachers who teach basic subjects get better results in exams than those who teach vocational disciplines; a minimum of professional experience has a significant impact on the results of teachers, but the experience gain or obtaining the basic teaching teaching certification does not result in a significant increase in the results at the tenure exam. The probable causes are of systemic nature, due to school management, as well as to the national strategy of the initial training, the evaluation for obtaining a promotion and the mobility of teachers.

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Keywords: national evaluation; international evaluation; school results; tenure; professional results.

1. Introduction

The quality of the education system, especially the lower secondary one, inevitably comes to the attention of society during the exam period of lower secondary and high school or when communicating the results of international assessments that measure the students' fundamental daily coping skills. Quality limits are imposed every time, the flaws of the education system materialized in objective quantitative indicators such as school dropout, the results of the national assessment at the end of the 8th grade, the results of the Baccalaureate exam or the results of international tests measuring functional illiteracy. These indicators have an objective character, in the sense that they apply indiscriminately to all students of the same level of education.

In the document "The Romanian Educational System" (INS, 2020) published annually by the National Institute of Statistics, the meanings of some quantities are defined, which are formal statistical indicators we operate in this paper.

The dropout rate is defined as "an important indicator that evaluates the performance in lower secondary education (excluding special education)". The indicator represents the difference between the number of students enrolled at the beginning of the school year and the number registered at the end of the same school year, expressed as a percentage ratio to the number of students enrolled in the beginning.

The graduate is the student who finished the last year of study of an educational cycle, regardless of whether or not he passed the graduation exam (national tests / baccalaureate / bachelor, etc.). The success rate in the national evaluation represents the difference between the number of graduates in the lower secondary cycle and the number of graduates who obtained at least an average of 5 in the two sections of the evaluation test.

The baccalaureate pass rate represents the percentage of graduates who pass the exam out of the total number of those enrolled.

The rate of graduates with a baccalaureate degree refers to the percentage of those who passed the baccalaureate exam out of the total number of graduates in the current year.

The main factors influencing these indicators are:

– *the quality of life, socio-economic conditions of some categories of population,* the most disadvantaged urban areas being those of peripheral neighborhoods, rural areas, poorly integrated minority groups - especially Roma and categories of people with special needs (bodily health, sensory integrity motor, mental health);

– *the technical-administrative quality of the school* - equipment, comfort, customized facilities for compensation and / or motivation of students and teachers;

– *the quality of the teaching staff*, regarding both specialization in the field, and the psycho-pedagogical dimension.

In the administrative system in Romania, the first two series of factors, social services for quality of life and school administration, are the responsibility of local authorities; the quality of teaching and school management staff is the responsibility of the education system which regulates and manages the initial and continuous training of teaching staff, the selection and distribution of teachers in schools, continuous assessment, career progress and recognition of performance through graduations and merit salaries for the educational staff, be it members of the teaching or non-teaching staff.

Pedagogical research cannot determine the extent to which a significant increase in the quality of educational staff would directly lead to an improvement in the situation in terms of the indicators in question, but the entire scientific community admits that there is a close link between them.

2. Analysis of Students' Results in National Assessments

The general results revealed by the indicators defined above give synthetic information on the quality of the education system. Concerning school dropout, a study conducted by the Institute of Educational Sciences in 2009 - 2014, five school years (period with significant changes in legislation by introducing grade 0 starting with the school year 2012-2013) shows an average dropout rate increasing from primary to highschool between 1.1 and 3.8% (ISE, 2015). For comparison, we insert the data of the school year 2018 - 2019 in Table 1.

Table 1
Dropout Rate – Primary School to Highschool

LEVEL	YEAR					
	2008-09	2009-10	2010-11	2011-12	2012-13	2018-19
Primary	1.2%	1.4%	1.6	1.6	1.1	1.6
Secondary	1.9%	1.7%	2	1.9	1.7	1.7
Highschool		2.2	3.2	3.8	2.8	2.6

The latest information of the National Institute of Statistics, in the Communication of June 2020, regarding the dropout rate shows that in the 2018-2019 school year the following values were registered: 1.6% in primary education, 1.7% in lower secondary education and 2.6% in high school and vocational education, which means that school dropout tends to increase. It

should be noted that, in all the data presented, the critical values are higher in rural areas than in urban areas.

We note that in ten years, from 2009 to 2019 there are no significant differences in the dropout rate. In absolute terms, however, the situation is serious; in general, a percentage designates 13,000-15,000 students in primary and lower secondary school, and about 8,000 students in high school, respectively. Annually, in Romania over 20,000 students drop out of school before coming of age, which allows us to estimate that up to 80,000 children of each generation reach adulthood without a minimum qualification.

Regarding the school results of the graduates, in the National Assessment, at the end of the lower secondary cycle, we follow two indicators, namely: Participation rate and Pass rate. The participation rate indicates the share of students who took both tests out of the total number of students enrolled for assessment. We do not have data on the number of students who attended classes but could not be enrolled for participation in the assessment because they did not pass the 8th grade. The pass rate expresses the share of students who obtained a minimum average of 5 in the two tests. In the last five years, according to the results collected from the information published by the ministry on www.edu.ro, the results listed in Table 2 can be ascertained.

Table 2
Participation and Pass Rate at the National Assessment – Lower Secondary Education

INDICATORS	YEAR				
	2016	2017	2018	2019	2020
Participation rate in the National Assessment	96.7%	97.1%	94.8%	94.2%	93.1%
Pass rate in the National Assessment	75%	76.9%	73.48%	73.1%	76.2%

The data show that between 4% and 7% of 8th grade graduates partially participate or do not participate at all in the national assessment. However, these students can continue going to school, after the distribution in the order of the results of the students who participated in this examination.

The results at the end of high school indicate significantly different values in graduates, be they students who finished high school, students who participated in the exam or those who participated and passed the Baccalaureate exam (Table 3).

The data presented refer to the graduates of the years mentioned in the table. It is noted that every year the total pass rate of those enrolled in the exam, including failed graduates from previous generations, is lower by 5 - 7%, which means insignificant recovery of those who did not obtain the Baccalaureate degree in their graduation year.

Table 3
The Situation of Completed High School Studies

CRITERIA	YEAR				
	2015	2016	2017	2018	2019
Graduates (thousands)	189.9	152.7	153.6	148.7	149.2
Enrolled in the Baccalaureate Exam (thousands)*	152.7	120.8	121.8	121.0	120.5
Students who passed the Baccalaureate Exam (thousands)	110.1	89.8	94.6	94.0	93.4
Pass Rate of Baccalaureate Exam	72.1%	74.3%	77.6%	75.2	77.5%
Graduates Rate (those who obtained the Baccalaureate diploma)**	57.9%	58.8%	61.5%	63.6%	62.6%

*Including graduates from previous years, but without a Baccalaureate diploma
**The rate of current year graduates

Based on the previous data, we draw the conclusion that about 35% of high school graduates do not obtain a baccalaureate degree. Students who graduate from technological and vocational high schools, in case of passing the tests specific to the specialization, obtain a certificate for level three or four of qualification, even if they do not obtain the Baccalaureate diploma.

The sum of the percentages of systemic failure - school dropout, the rate of failure in the national assessment and the baccalaureate - allows the approximation that in the average of the last five years of each generation of students about 5 -7% drop out of school early, 25% of those finishing grade 8 do not pass the national assessment tests and 35-38% of those enrolled in high school do not obtain the baccalaureate diploma. Based on the national evaluations at the end of middle school and high school, with approximately 35% success rate in high school with Baccalaureate, the performance of the pre-university education system can be assessed as poor. The vocational education system has not been included in the study although it is growing in popularity after a review of successive changes in recent decades. For example, the concrete situation of the Baccalaureate 2020 promotion presents the following landmarks (Peticilă, 2020): 230,000 students enrolled in the first grade (2008); 187,000 in the records of the 8th grade (2016); 111,598 pass the national assessment in the same year; 123,800 high school graduates and 32,000 in vocational school (2020).
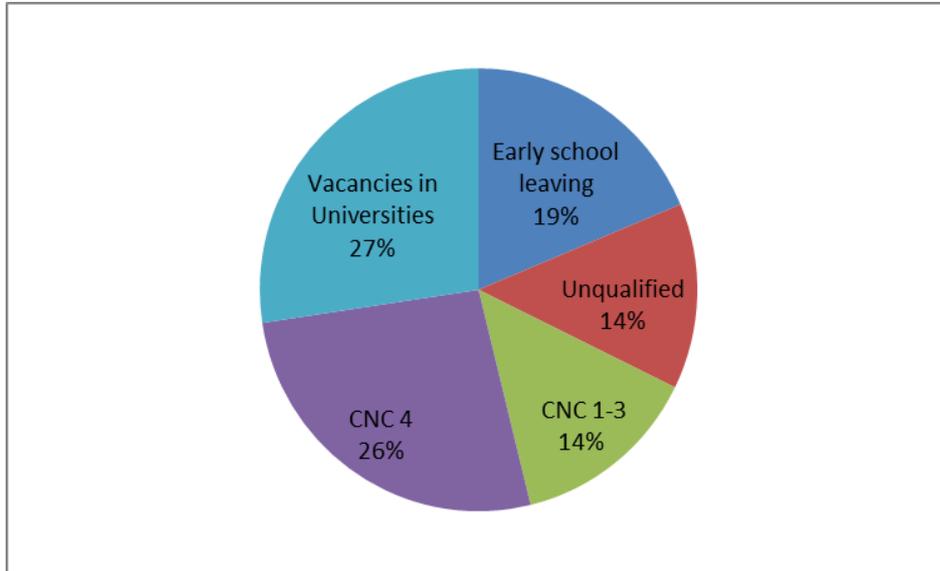
Fig. 1 – The probability of qualification of the 2008-2020 generation of students
(CNC – *The National/European Qualifications Framework*).

The school results of this generation show (Fig. 1) that the employability of 33% is possible only in unskilled jobs. The 15% who finished the 8th grade have a chance to recover because even high school graduates who did not pass the National Assessment have the right to enroll in vocational schools or even high school on vacant places, which happens as results show from the difference of approximately 11,000 students between the number enrolled in high school and the number of graduates of the national assessment of that generation; the difference also reflects possible graduates of previous generations. Out of all the students who complete the eighth grade, 14% enrolled in vocational schools which, depending on the duration, certify the levels 1, 2 or 3 of qualification in a well-defined profession, with good employability because companies in the field are involved in the practical component of the training program, in partnership with the school. More than half of this generation graduated high school in 2020 with certificates of competency at level 4 of qualification and half of them have places in the state university system accessible to high school graduates who have passed the baccalaureate exam.

The results of an international assessment, namely the results of the Program for International Student Assessment (PISA), coordinated by the Organization for Economic Co-operation and Development (OECD), lead to similar conclusions. The critical synthetic indicator of the program is the functional illiteracy, defined by the organizers as the way of operating with the information of the person who "cannot engage in all those activities in which a

certain level of education and knowledge is needed for its effective functioning within the group or the community to which it belongs and at the same time to enable it to use reading, writing and counting for it and for the development of the community to which it belongs", the source indicated being *Handbook of Household Surveys, Revised Edition*, published in New York in 1984.

The PISA test measures the basic competencies of 15-16 year old students on the verge of completing compulsory schooling in three directions: reading&understanding texts, mathematics and science, at the level considered necessary for social integration and access to a job.

Romania has been participating in this program since 2006, with a sample of 70 schools; "The sampling of schools is carried out by the OECD consortium on the basis of statistical data on the school network and the distribution of the population of 15-16 year olds" (PISA.a). The share of different types of educational units in the sample reflects their share in the school network. The Institute of Educational Sciences has made a synthesis of the results obtained by Romania, which shows that we are constantly significantly below the European average.

According to the results, at the 2018 edition, similar performances were obtained to the 2009 edition; meanwhile, in 2012 and 2015 the results were better, but the increase was statistically weak or even insignificant. The individual results are ranked on six levels, the first two being considered unsatisfactory for a good social integration in everyday life. These values give the qualifier of functional illiteracy. In Romania, functional illiteracy is estimated at 44% based on the results of the last PISA 2018 test; compared to the year 2015 we notice an increase of six percent.

Within the same assessment program, objective data regarding the student's living conditions are also collected, as well as subjective data regarding the learning conditions provided by the school and the professional conduct of the teacher in the students' perception. The processing of students' responses allows a ranking of the main factors with a negative impact on student performance, namely (PISA.b):

– poor, uncomfortable, tense, frequently dysfunctional family conditions of students;

– the quality of the physical environment and especially the broad social context, including the culture and school organizational climate, of the student's evolution;

– the quality of the educational staff that exerts its influence on the student during schooling.

While the family factor is practically not controllable by the school system, the conditions of education in school and especially the quality of the teaching staff is the responsibility of the educational system which, through budgetary policies, initial and continuous training programs of the teaching

staff, through regulations for its promotion and continuous evaluation, contributes significantly to regulating teacher performance.

Academic-level scientific research does not provide sufficient data to prove strong causal links between teacher professional training, his/her quality of performance and student performance (Menter *et al.*, 2010, cf. Caena, 2014); the isolation of variables is practically impossible due to the complexity of the subjective entities, the interactive processes in question, as well as the ethical principles of scientific research that do not allow the creation of deliberately non-compliant situations. For these reasons, the principle of interdependence is almost unanimously accepted as an assertion. The answers to the PISA - 2018 questionnaire of the Romanian students regarding the teachers' performance show that "the teachers' attitude towards teaching, the enthusiasm manifested in the didactic activity influences the students' results" (PISA.b). Given that over 49% of Romanian teachers have master's degree studies compared to the European average of 43%, but the level of functional illiteracy among students is significantly higher than the European average, we consider that we must question the initial and continuous training system of teachers in Romania. The students' answers to the questionnaire target the problematization towards "attitude" and "enthusiasm", in a word vocation in the practice of the educational profession.

3. The Teacher's Meeting with Adolescence

The studies of the last two decades place the main emphasis on the complexity of the educational activity generated by the new technologies that are more and more imposed as factors of change and put their imprint more and more on all daily activities in contemporary society. In this paragraph we bring back to attention the mental complexity of the person, the sensibilities and vulnerabilities of the personality, especially at certain school ages, without which the discussion on the professionalization of teachers does not make sense. We know that the human psyche subjectively, consciously or unconsciously internalizes all personal experiences; we know that every action and reaction of the teacher leaves traces in the mental system of each student. The essence of the teacher's professionalism is to generate constructive effects in the system of values, knowledge and behavior of students, with maximum comfort and minimum emotional frustration.

Being a teacher means first of all vocation and choice, devotion and dedication, knowledge and patience, a destiny voluntarily assumed regardless of conditions or social contexts! It goes without saying that these qualities or aptitudes, calls, predispositions are supported by the knowledge of the personality, of the characteristics of the school ages, mentally drawing and following in perspective the evolution of the student.

The need to train the teacher in the sense of deep knowledge of the characteristics of school age, with their vulnerabilities, in order to achieve a real, mental and moral personalized development of students, in order not to reduce education to training, or knowledge transfer in the context of teaching an anonymous, amorphous mass of individuals. Everything the teacher does as a teacher, includes a "human need for a logical framing of the observed phenomena" that leads to the need to know the theoretical models of personality development, which "tries to explain reality in its entirety" (Sion, 2003).

Similarly, the deepening of the development models is important, because it helps the future teachers to have the necessary explanations to overcome the moments of exception of the physical and mental development of students.

Thus, the psychoanalytic approach probes those forces, mostly unconsciously, at a deep level, which are discovered and in interaction with the environment lead to personality development: "The personality from the psychoanalytic point of view is organized according to a dynamic and hierarchically stratified model, formed by courts with functional specializations. The instances of personality are: the unconscious as a reservoir of instinctual impulses and energies, the subconscious or preconscious as a place of censorship on the impulses coming from the unconscious, and intermediate court between conscious - unconscious, and the conscious as the last instance that realizes the exchange of information with the real world - external, as well as with the inner world in the sphere of the unconscious" (Sion, 2003).

Of great interest for our issue is that among the fundamental ideas of Freud is the notion of human behavior and, consequently, the direction that personality development derives from two very strong tendencies: the survival instinct and the need to procreate (Roazen, 1975). In this way, pre-adolescence, adolescence and early youth will become stages in the student's life in which each teacher will contribute to strengthening those moral axes and motivational resources that will help him evolve, develop and adapt.

The teacher must act according to the fact that the student's consciousness is permanently vulnerable in relation to anxiety (Robu, 2017). Freud describes three types of anxiety - neurotic, moral and reality-related anxiety (Hjelle and Ziegler, 1976; Millon, 2004). Against all these forms of anxiety, the Ego protects itself using what, in dynamic psychology, is known by the term "defense mechanisms" such as denial, repression, rationalization, projection and sublimation. Each of these mechanisms can lead, to a greater or lesser extent, to creative-constructive, socially desirable, frustratingly conformist, or even antisocial behaviors. Only by deep understanding, beyond the simple knowledge of defense mechanisms, can the teacher help the preadolescent or adolescent to defuse conflicts, to re / become cooperative, to increase self-esteem and become motivated by the future, the advantages of attending school, the effort made to obtain good results, to complete their

studies with the highest possible qualification. By channeling these mechanisms to behaviors favorable to personal development, the teacher contributes to becoming the person, to building the personality that updates by increasing the individual potential.

Erik Erikson, through the theory of psychosocial development, is one of Freud's most important successors, noting that his writings expanded psychoanalytic thinking involving social activities, special education, early education, child care, psychiatry, psychology, thus supporting the other categories of humanities professionals. The staged approach to personality formation on the side of socialization, Erikson's theory of personal and social development, offers teachers, regardless of specialty, an explanation and at the same time a tool for training adolescent students. The moment of building identity and the assumption of roles, a crucial stage for the student to be himself, conflicted by the correct adoption of roles, gives the teacher the ability of a "magician". For the adolescent, the decisive relationships are those built in the group of friends, which requires the mentor the quality of fine observer, as well as the ability of a balanced, controlled adult, with the vision of students' evolution, qualities to be obtained with deep reflections and perseveringly cultivated. The power of the model induced by the teacher, moral, attitudinal and behavioral, is overwhelming in this period of adolescent life, as well as his ability to treat them differently, individually.

The humanist approach, an orientation that would become the movement of human potential or humanistic psychology (after the expression of one of its initiators, A.H. Maslow, "the third force in psychology") advocates the discovery of man in his unity and totality, for the development of the individual.

American psychologist Abraham Maslow formulates the goals of humanistic psychology as follows: "brotherhood, hatred and love, sickness and health, understanding and conflict, happiness and unhappiness - lead to a better understanding of human nature and a psychology with direct applications to human life." (Zlate, 2000). The meaning / purpose of humanistic psychology was to describe and explain the native potential of man, the process of personal growth, maturation and / or decline of personality, a successful attempt to know and interpret the human being in a holistic manner (Robu, 2017).

Aspects of human behavior, according to Maslow, can be understood by the individual's inclination to discover the fulfillment of certain objectives that make life full of achievements, full of importance, significance and value for him. Man is the being who aspires to become more than he is (Jones, 1965). Man's longing for self-realization is the supreme need, the source of full satisfaction (Robu, 2017). Maslow's research presented in works such as "Motivation and Personality", "Toward a Psychology of Being" reveals that self-realization presupposes, if not based on vocation, a constant effort directed towards a good goal. This effort must have a well-defined object, in the case of

teachers, the student, the "child" in development, to be consistent and permanently self-motivated depending on the particularities of changing times and generations.

Knowing the periods of preadolescence and adolescence, we understand more and better the importance of teacher training in terms of instrumenting the ability to shape students' personalities, understanding behavioral manifestations in relation to the needs of age, in order to stimulate and sustain socially desirable and self-constructive behaviors, of facilitating their transition to social confrontations with a high degree of complexity. Teachers with middle school and high school students need a complex process of knowledge transfer, empathic attitude of regulating the individual emotional-motivational states of students by enhancing the potential of each and helping to self / creative sublimation of age-specific frustrations, even personal ones. Or, as we find out through the PISA questionnaires, the "attitude" and "enthusiasm" of the teachers are invoked as not meeting the students' expectations.

4. Professionalization of Teaching – from Student to Teacher

In European communication the phrase used in the sense of our title is "initial teacher education"; the equivalent of the wording in Romania is "teacher training" from the name of the department dedicated by law to this educational program, or "educational staff training" in normative wording and current language in the education system.

Countries participating in international education programs such as Erasmus or Eurydice / Erasmus-plus, programs from which we report in this study on various educational organizations and practices, do not have a single version of university programs, but everywhere there are different accessible university routes for flexible initial teacher training. We rely on this study on the synthesis published by Francesca Caena (2014), "Initial teacher education in Europe: an overview of policy issues", conducted in the study group "School Policies" of the European Union based on country reports to the EU and by consulting a state-of-the-art bibliography. We fully assume some principles promoted by the author of the study, namely:

– the crucial importance of the initial training of the future teacher, prior to the activity of the department;

– the need for continuous updating and regular evaluation of teachers' educational skills;

– the assertion that the quality of teaching performance generates the difference between authentic learning, based on understanding – "measured" in essence by PISA tests - and formal learning, based on reproduction, poorly operational in new situations, defining for functional illiteracy;

– addressing problematic, new educational situations, as research topics that involve new, innovative solutions, followed by capitalizing on the results in

educational practice, as opposed to the simplistic approach of applying formal, usual intervention models.

The study program for teacher training is offered to students as a bachelor's program dedicated to teachers at different study cycles and curricular areas, as an optional program with credits other than basic specialization, or later specialization as an opportunity to diversify occupational skills. In most European countries these variants work at the same time, in some countries for all categories of educators, in others distinct forms for distinct categories.

In Romania, in the last century, several variants have been tried. A consistent study on the training of teaching staff in the period 1864 - 1948 is published under the title "Interwar alternatives in teacher training" (Maciuc, 1998). Training of the teaching staff for preschoolers and the primary cycle is done in normal schools, pedagogical colleges / high schools considered vocational high schools with a continuous tradition from the second half of the 19th century, functional even today; the qualification obtained through these courses was that of "teacher", "educator". In recent decades, specialization has been introduced through undergraduate and master's studies, through academic programs of the faculties of Psychology and Educational Sciences; the qualification obtained is that of "primary education teacher". The training of teachers for the lower secondary cycle was done through radically different models: through programs of specialized institutions such as pedagogical seminar, pedagogical college, pedagogical institute for three years, functional in universities and assimilated to university studies – with long functional programs or only a few decades; In some periods, teachers were recruited without prior pedagogical training, being self-taught or initiated, specialized in parallel with and by exercising the effective role of teacher - especially those for technical and economic disciplines. In the last two decades, the professionalization of teachers has been legislated through modular psycho-pedagogical programs, of 30 credits each, on two levels, offered in parallel or subsequently to the bachelor's and master's studies. The complete program is of 60 professional credits, it is certified by going through the psycho-pedagogical training program, national curriculum managed by the Department of Teacher Training accredited within the universities. Psycho-pedagogical training and master's degree in the basic specialty condition teaching in high school.

Currently, access to teaching in lower secondary and high school education without a higher qualification and at least 30 credits from psycho-pedagogical disciplines is rarely possible; practically only under one percent of the employees at the departments are unskilled, temporarily substitutes in critical positions, generally from the rural area with very difficult access (INS Annual Reports).

This form of teacher training does not generate the expected quality either; recognized authorities in the field, teachers and directors of these departments consider that the psycho-pedagogical training program, especially

as applied in practice in our opinion, "although it was a progress over the previous training system, based on 4 disciplines infused in the academic program, it proves to be cumbersome, expensive, energy-consuming, inefficient and weak inducer of responsibility for graduates - future teachers" (Cucoş, 2020). The main causes, as invoked by the author to which we subscribe with our arguments, concern:

– the extrinsic motivation of the decision to enroll in the psycho-pedagogical training program by the majority of students, the teaching career being taken into account as a useful but little desired occupational alternative;

– admission to the psycho-pedagogical training program is formal, based on a superficial interview, without serious pre-selection because it takes place under the pressure of the department's budget depending on the number of students, with minimum allocations per student (8 physical students / 1 equivalent student);

– the curriculum is 85% imposed, quantitatively oversized compared to the time given and over-credited to the depth at which the assimilation of such complex contents as those set out under the previous title can be achieved;

– the marginal treatment of the program by the faculties of the universities through uncomfortable allocations to the students in terms of schedule (on Fridays, around students' lunch break or at the last interval of the day);

– the practical component undersized compared to the need for practice of the beginner teacher, and this is partially achievable due to the inter-institutional non-coordination of the students' program with the class schedule and the impossibility of stimulating funding of pedagogical mentors in schools.

Access to teaching has a severe filter that ranks the qualified educational staff - diploma and psycho-pedagogical training certificate - namely the national exam called "Tenure" which provides beginners access and staff mobility within the system, through competition. Formally, there are two levels of success in this exam; a first level requires a minimum grade of 7 in the decimal grading system, in order to obtain indefinite tenure in education, and the second level requires a minimum grade of 5 to temporarily fill a position in education during a school year. In practice, due to high competition for a tenured position, for an unlimited or limited period, the minimum success values have little chance of access.

The study of the organizational methodology and the context of the tenure exam lead to some important findings to consider, namely:

– The share of psychopedagogical knowledge evaluated in relation to those specialized in the field of teaching discipline(s) for which the competition is given is low. Only one third of the score is explicitly dedicated to the knowledge of teaching methodology compared to two thirds that are given for the specialized knowledge of the disciplines at the level of teaching in the system, knowledge that is based on bachelor's and sometimes master's studies in

the field. This component does not include tasks of solving problematic situations from a psycho-behavioral point of view, of tech use or other issues that may inevitably occur during teaching (breakdowns, spontaneous alarms, individual problems of attention, understanding, discipline, health of a / some students etc.). Regarding the evaluation, the national framework structure results in sample tests adapted thematically to each exam discipline; moreover, the thesis correction commission is made up of specialists in the field. For this reason we admit that our study is relevant for analyzes by disciplines or curricular areas, but has only indicative value for interdisciplinary comparisons.

– Exam preparation is poorly motivated for at least two reasons: the hope of solving the candidates' problem is low, because the number of tenured positions put up for competition is very small compared to the replacement positions and the large number of competitors; at the same time, the system of distribution on temporary positions severely prioritizes the choice, but is very tolerant in case of need for positions not desired by those with high grades; the occupation of critical positions is not particularly stimulated.

From a methodological point of view, to carry out this study we start from the premise that the results obtained, expressed in grades, reflect the quality potential of the participants as teachers. Pedagogical research has not identified strong correlations between the professional quality of the teacher and the school results of students, but the majority opinion among specialists, theorists and practitioners of education is the existence of a close relationship; the difficulty of correlating teacher training with student results is due to the diversity and complex nature of the factors influencing school results, but also the difficulty of experimentation, control of variables (Menter *et al.* 2010, cf. Caena, 2014). Reporting the results of a national exam with stakes for participants to their own results over time, however, can bring elements of reflection on the issue of teacher training and promotion strategy throughout the career.

5. Teachers' Results in the National Tenure Exam

For the present study, we processed data provided by the Ministry of Education following the 2020 national tenure exam for a county with a strong university center where there are four national accredited departments for training staff in curricular areas such as communication and science, technology, agriculture, veterinary medicine, and arts. The results in this county are higher than the multiannual national average in terms of the share of holders, the participants who obtained above grade 7 in 2020 being 61% compared to the national average of 47% in the last five years, also the share of low grades below 5 is of 14.5% compared to the multiannual national average of 19%. The publicly available data regarding the tenure exam are the results - the marks obtained at the written exam - and a series of data about the

professional identity of the candidates from which we can deduce: the professional category according to ISCED; the academic specialization of the teacher - the curricular area of teaching, areas defined by the national methodology of grouping the disciplines; the level of performance at the graduation of the studies in the field of specialization - but not that of the graduation of the psycho-pedagogical training program; teaching experience and the level of qualification obtained in career progress.

Based on the elementary processing of these data, we identified 1160 teachers participating in the analyzed competition who completed the exam, with the following qualifications:

- 436 primary and preschool teachers ISCED-1 and ISCED-0 respectively competed for 114 positions;

- 724 teachers for ISCED-2 and ISCED-3 high school, competed on 130 complete positions and 157 incomplete vacancies, as follows:

• 196 teachers of Romanian, Latin, and modern languages - English, French, German - curricular area "Romanian language and communication" - L&C;

• 129 teachers of Mathematics, Physics, Chemistry and Biology, curricular area "Mathematics and sciences" - M&S;

• 195 teachers of History, Philosophy, Geography, Psychology, Religion - curricular area "Man and society" - O&S;

• 81 teachers of Visual Arts and Music Education - curricular area "Arts";

• 123 teachers of Physical education and sports.

There is a significant difference in competition by teacher category; among teachers for primary education the competition is more relaxed, while among teachers for lower secondary, high school, vocational education, non-formal and post-secondary education institutions, where mainly teachers focused on specialization work, for which teaching is usually the second or third option, the competition is higher.

5.1. Influence of Teacher Training Programs on Tenure Exam Results

A first analysis criterion aims at the level of results depending on the type of academic specialization program, direct training through bachelor's and master's programs dedicated to teachers and psycho-pedagogical training complementary to an academic specialization program relevant to the discipline to be taught:

– Direct bachelor's programs train teachers for ISCED-0 pre-school education and ISCED-1 primary education. For these careers, the decision is taken early, in most cases by choosing pedagogical high schools after graduating lower secondary school, perceived as vocational high schools, at the

age of 15-16. Most graduates of these high schools continue their studies through undergraduate programs, specialization "Pedagogy of primary and preschool education" and obtain the qualification of ISCED-0/1 teacher.

– Preparation for ISCED-2 and ISCED-3 high school education involves choosing an academic field of specialization on which the training focuses primarily, because all the student's academic facilities are dependent on the results obtained during this course: obtaining accommodation on campus university, scholarship, graduation of the academic year. Those interested in teaching opt for the psycho-pedagogical program offered complementary, additional to the basic training and which adds to the student's program a consistent discipline, of 5 credits per semester during the bachelor's studies. The debut in teaching is accessible on the basis of two distinct study documents, namely the bachelor's degree and the certificate of graduation of the psycho-pedagogical program Level I - 30 credits -, for the qualification of "teacher of ... discipline ..." in ISCED-2 lower secondary education. High school education ISCED-3 requires master's training in the field of specialization and psycho-pedagogical training Level II (also 30 credits).

The results obtained at the national "Tenure" exam by aspirants to teaching vacancies and the mobility of experienced teachers are presented in Table 4. It is obvious that the marks obtained by those who choose early and explicitly for a teaching career are significantly better than those who are focused on basic specialization during bachelor studies.

Table 4
Marks and Percentages at the Tenure Exam

Level of Teaching	MARKS			
	< 5	5 – 6.9	7 – 8.45	> 8.5
ISCED 0&1 Teachers	7%	18%	45%	30%
ISCED 2&3 Teachers	17%	28%	32%	23%

The fact that 75% of ISCED-0 & 1 candidates obtain marks above 7 as a tenure criteria, compared to only 54% of ISCED-2 & 3 is an argument that supports the stimulation of early choice and teacher training through undergraduate programs focused on teachers.

5.2. The Informal Status of the Discipline in the School Curriculum

In the public mentality, but also in the unwritten norms of teacher's rooms, school subjects are treated as having a different informal status. The different weight in the school curricula, the quality of "exam" subjects such as Romanian Language and Mathematics for evaluating the level of performance at the end of the lower secondary cycle, to which are added for the completion of the high school cycle others such as Physics, Chemistry, Biology etc. are

traditionally considered "important" disciplines, while arts and sports disciplines or non-formal activities are perceived, and as such treated, as "general culture", less "imported" by the community, but worse is that by many teachers of their own disciplines. We follow the differences in teachers' performance according to the criterion of the informal importance of the subjects taught.

In the present study, the results obtained at the tenure exam by the candidates of the different specialization categories with great consistency in the Core Curriculum are detailed. The main curricular areas were grouped according to the national system such as "Language and Communication", "Mathematics and Sciences" and "Man and Society" as decisive disciplines for the formation of key competencies in the formal curriculum and assessed both by national exams to complete a school year, as well as the PISA tests, under the artificial name of "basic disciplines", separate from the vocational disciplines in the field of arts and sports (Table 5).

We can notice that the share of very good and good grades - over 7 - is over 50% only for teachers who teach basic subjects. The informal status of the discipline does not determine the result obtained in tenure exam, but influences the attitude towards the exam itself, the motivation and respect for one's profession and professional image, with an impact on students.

Table 5
The Percentage of ISCED 2 & 3 Teachers' Results by Curricular Areas

	MARKS			
	< 5	5 – 6.99	7 – 8.99	≥ 9
Basic disciplines	11.5%	25%	45%	18.5%
Arts	30%	24%	26%	20%
Physical Education and Sports	34%	24%	29%	13%

In the case of physical education and arts teachers, there is a very large share of critical results, non-promotion, a situation that can be explained in addition to the status of these subjects and by teachers of vocational disciplines focusing on identifying and cultivating sports or artistic talents among students, less on class activity, or focusing on one's own sports career in the case of young teachers, active as athletes, or on one's own artistic activity.

This result is all the more unnatural as these categories include graduates of study programs dedicated to educational activity, from the faculties of "Physical Education and Sports", or a separate study program at the University of Arts, "Music Education".
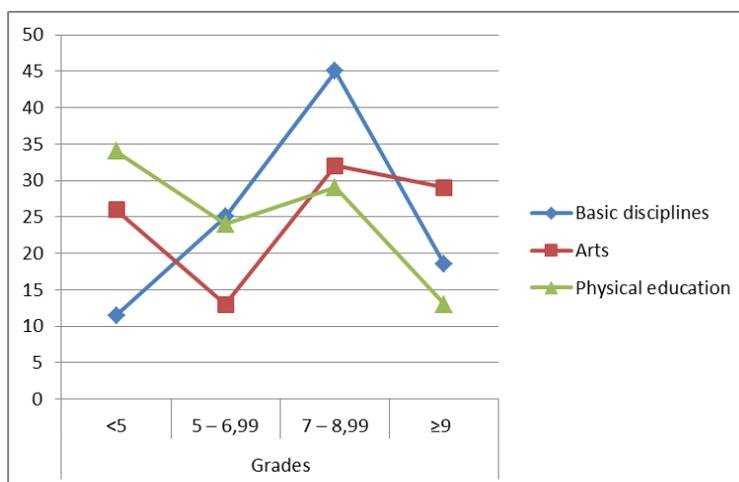
Fig. 2 – The percentage of ISCED 2 & 3 teachers' results by
informal categories of disciplines.

A better view (Fig. 2) highlights some differences in the distribution of
results. We find that in the analyzed year, the results of teachers in the field of
basic subjects have a desirable distribution, with the share of very good grades,
those over 9 significantly higher than the critical ones, below 5 and above
average grades, over 7 obtained by over 60% of participants. The distribution of
grades of teachers in the field of arts and physical education and sports has
similarities: the values are close in the area of higher average results, but for
very good grades the difference is significant in favor of arts teachers; there is
also a very high share of critical grades, of non-promotion in relation to the very
good ones, especially for physical education and sports teachers. The very high
share of critical results among arts and physical education teachers can be
explained both by the less formal, freer, highly personalized specificity of
university specialization programs, and by the fact that those professions have a
greater applicability in the field of liberal occupations, the professionals of the
fields being less dependent on the education system.

Preliminary preparation for participating in a written national
competition, with two-thirds of the test on specialized subjects, should generate
better results if due importance is given to these disciplines according to their
role in the integral personal development of students, their physical health and
artistic culture.

5.3. The Results of Teachers Who Teach Exam Subjects

The results in the tenure exam of teachers who teach the relevant
disciplines for the final exams of lower secondary school and high school cycle

are analyzed. The results obtained by the candidates who took the exam in the following disciplines were extracted from the database:

– Romanian language - from the curricular area Language and communication - exam discipline both at the end of lower secondary school cycle - National assessment - and Baccalaureate;

– Mathematics - from the curricular area Mathematics and sciences - exam discipline both at the end of the lower secondary school cycle - National assessment - and Baccalaureate;

– Physics, Chemistry and Biology - from the curricular area Mathematics and sciences - optional subjects for the Baccalaureate exam

– Philosophy, History, Geography, Psychology - from the curricular area Man and society - optional subjects for the Baccalaureate exam.

The results at the tenure exam are grouped on intervals relevant to the criteria for distribution by positions (Fig. 3); within the upper range, very good results of over 9 with a high probability of obtaining tenure are highlighted separately, and the average results, the grades from 7 to 8.99 which give the right to tenure for an unlimited period; at the lower levels are grouped the weak grades, the range 5 - 6.99, results accepted for temporary replacements and the critical grades, lower than 5. The weight of the obtained grades are shown in Fig. 4.
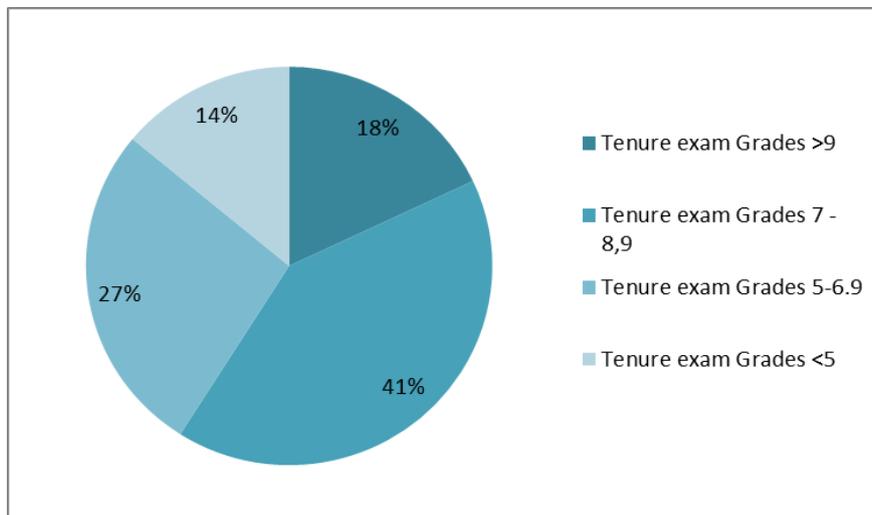

Fig. 3 – The share of performance levels in the category of exam disciplines.

Generally speaking, the highest share among teachers in the field of examination disciplines has higher average grades, over 7 which gives the right to tenure. The 18% who get marks above 9 are those who have real chances to tenure positions.
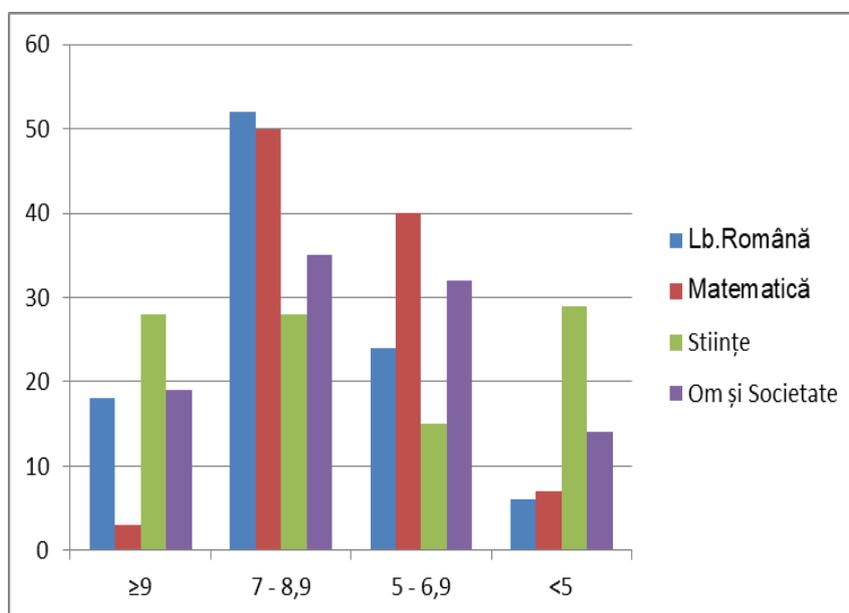
Fig. 4 – The share of tenure results by exam disciplines;
(blue – Romanian Language, red – Mathematics, green – Sciences,
purple – Man and Society).

The analysis of the results obtained by the teachers of the different disciplines shows significant differences; as seen in Fig. 4, Romanian Language and Mathematics teachers obtain higher average results in over 50% of cases and the least critical, non-promotion results.

This situation favors the quality of teaching in terms of the strictly didactic dimension, but does not guarantee the quality of education in its entirety. The very good results that could give hopes of superior performances in the work of the department are poorly represented in the compulsory subjects at the National Assessment, under 20% in Romanian and under 3% in Mathematics. The results of science teachers show a relatively uniform distribution; it is worth mentioning the high share of non-promotion results of almost 30% among teachers of physics, chemistry and biology.

5.4. Reflecting Academic Performance

It is admitted that the average graduation of a university program of specialization and also the grade obtained at a national exam for access to an occupation that requires university training are equivalent indications of the intellectual quality of the person as it will materialize in a highly qualified occupation, respectively in the activity in the department in the case of teachers.

Both indices are used in the system for allocating applicants to educational positions.

The vast majority of graduates who sooner or later go to work in the lower secondary cycle or high school are people with good and very good results at the end of specialized studies; almost 56% have averages over 9 at the graduation of the specialization program and only 6 -7% of those with averages between 6 and 7 aspire to a teaching career, which is promising for a good professional training.

Table 6

Comparison of Performances at the Graduation Exam of Basic Specialization and the Tenure Exam

Performance Difference	Graduation Mark					Curricular Area		
	≥9	≥8	≥7	≥6		L&C	M&S	O&S
Similar performance	24%	20%	18%	13%		17%	18%	28%
Increase in Tenure Exam		15%	15%	48%		6%	8%	13%
Decrease in Tenure Exam	76%	65%	67%	39%		77%	74%	59%

The difference in performance of the two series of grades, graduation and tenure presented in Table 6 shows that teachers with very high marks at graduation confirm their level only in proportion of 24% in the tenure exam, while the majority of 76% get lower grades, 20% below 7, and 6% get below grade 5, so they do not pass the exam. At the level of average performance, there are regressions lower than about 65%. For those with a graduation mark between 8 - 8.99 and 7 - 7.99, a percentage of 20% and 18% respectively remain at the same level, and 15% each obtain superior results.

The analysis by curricular areas shows a similar situation between Language&Communication and Math&Science teachers; below 20% they remain at the same level of performance, below 10% they increase and the decrease is over 70%. Man&Society teachers, as a group, show a better condition, with 28% maintaining their level of performance and 13% showing a positive evolution; in this category there are 57 professors of Religion - graduates of the Faculty of Theology which has a program dedicated to religious education, of which 21 obtained marks of over 9 in the tenure exam.

Based on these data, without a study based on qualitative methods, no conclusions can be drawn; however, they are sufficient to hypothesize, with a high probability of confirmation, that the current methodology of access and mobility in the pre-university education system for ISCED 2 & 3 teachers is not stimulating; a possible explanation would be that the hope of success in

obtaining the desired job is relatively low, at the same time the assumed failure has limited negative implications on the occupational security of the person.

5.5. Reflection of Professional Expertise

From the data of professional identity of the participants in the Tenure exam it is possible to know their level of experience in teaching. We analyzed the results obtained in the tenure on three levels of experience of teachers, presented in Fig. 5:

– Applicants for a teaching position - this category includes candidates with no other experience than that acquired during the psycho-pedagogical training program. This category includes both recent graduates of the current academic year and graduates from previous years, generally without professional experience in the field and / or at the level of university training.

– Beginners - teachers with generally reduced experience of 1 - 3 years until enrollment in the Basic teaching certification exam, the first stage of promotion in teaching.

– Experts - teachers with teacher certification level 1 and 2 who have passed at least the the Basic teaching certification exam, a complex exam to confirm the expertise in teaching.

It is necessary to pay attention to these data (Fig. 5) and to the existence of critical grades, below the admissibility threshold for beginners and experts. The values of these categories are close, the differences are practically insignificant in the area of average and critical grades, they also seem weakly significant in the category of very good grades in favor of teachers with teaching certifications.

The situation of the 12 teachers is very serious, out of which 9 from the Mathematics and Sciences curricular area, with didactic teaching certifications that did not obtain the minimum passing grade. In such cases, a regression of not only professional but of general personal quality can be suspected, especially in situations such as not passing a tenure exam after 5 years of experience in teaching, especially if this failure occurs in expert teachers, with teaching certifications. This situation calls into question the formative value of the experience of teaching, the quality contribution of the evaluation exams in order to progress in the career for a certain category of teachers, motivated only by their own interests.

The results obtained on the three qualification levels show a predictable distribution at the level of the graduates; between the weight of very good gradeds and critical grades the difference is weakly significant, as well as between the categories of average values.

In terms of graduate participation (Fig. 6), the Language&Communication and Man&Society curricular areas attract more graduates than Mathematics and Science; however, if the time of graduation is taken into account, it can be

found that Mathematics and Science graduates of the same year have the highest share in the category of applicants, respectively 28% compared to 15% of Language&Communication specializations and 10% of Man&Society specializations; it can be assumed that several science students are determined by the labor market to start an educational career immediately after graduation.
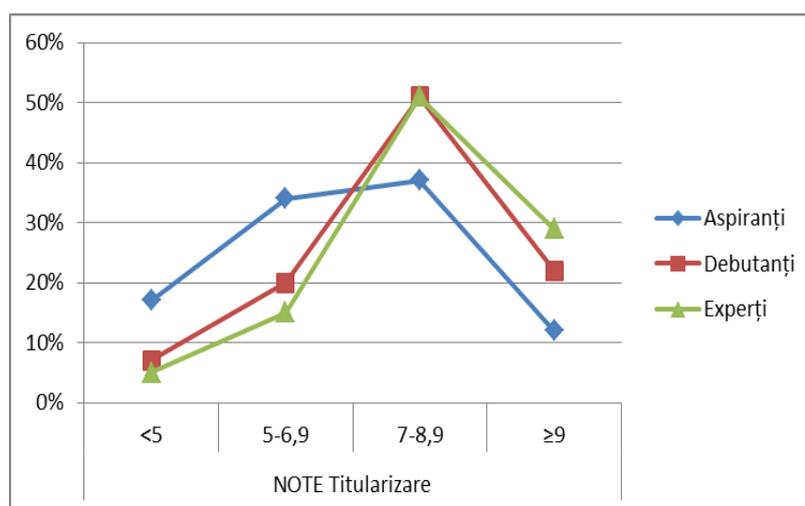

Fig. 5 – Distribution of results by qualification levels;
(Tenure exam results: blue – recent graduates, red – beginners, green – experts).
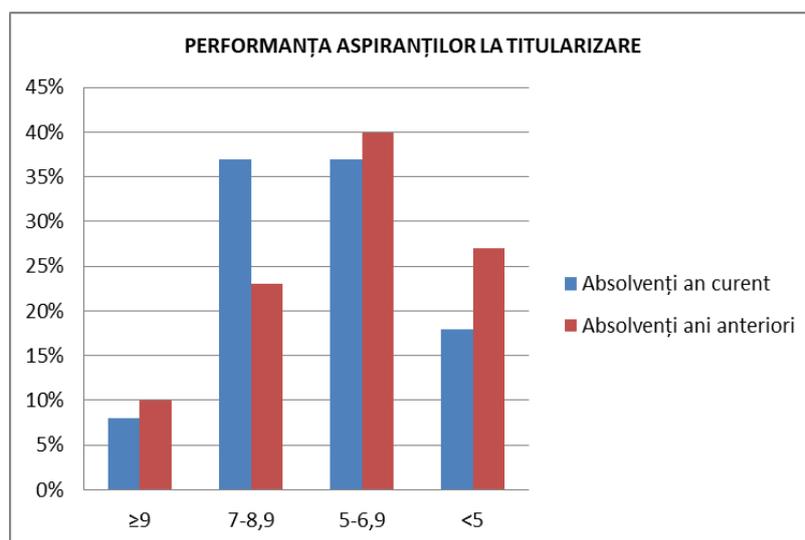

Fig. 6 – Distribution of applicants' grades according to the year of graduation;
(blue – current graduates, red – graduates from previous years).

We notice that out of the total number of applicants, only 15% are determined to start their teaching career immediately after graduation; the vast majority turn to this occupation after looking for other opportunities accessible through basic specialization. The results of current graduates are relatively similar; an insignificant difference of 2-3 percentage points appears in the category of very good grades in favor of graduates from previous years who either participated in such exams and failed, or were strongly motivated to devote time and effort to this first participation. More consistent is the difference of over 20 percentage points in the upper average grades, in favor of recent graduates, with relatively recent specialization and psycho-pedagogical knowledge.

We can also deduce from these data that for most graduates, teaching is not the first option after graduation; although 41.5% of the participants in the Tenure exam are without experience in education, only 6.5% of the participants come from the most recent promotion of graduates of the university programs and represent only 15.5% of the total candidates without experience in teaching.

6. Conclusions

In conclusion we notice that school results at the examinations for the completion of the primary, lower secondary and high school cycles are comparable to the results of the teachers at the national Tenure examination.

The arguments in support of this approach are the following:

a) Over 99% of the teachers of the pre-university education system in Romania are qualified, graduates of higher education and of accredited initial and continuous psycho-pedagogical training programs; the results of a national professional examination of this category reflect the quality of the educational system.

b) The teacher-student interactions are consistent in the conditions in which the students' participation in these evaluations is conditioned by the quality of graduate of the respective cycle, quality that can be acquired only by attending school within regulatory limits and promoting all subjects in the school curricula.

The graduation rate of the National Assessment at the end of the lower secondary cycle of around 75% and the pass rate of the Baccalaureate by the promotion of the same high school year of just over 60%, as well as the percentage of over 40% of students who obtain results below functional literacy, show that a significant share of each generation is not prepared for a comfortable life, of fulfilling their potential and participatory social integration. The main contribution that the educational system can bring to improve this situation is to ensure the quality of the teaching staff, from the selection system for initial training, initial and continuous professional development programs, terms of employment, systems of promotion and the motivation of the

specialized human resources. The major causes of the education system's shortcomings have to do with political priorities and national and local government.

The pass rate for teachers in the National Tenure exam is on average 81%, but especially the low performance (below 7) of 49% of the participants in these exams shows low skills of knowledge and pedagogical adaptation of specialized knowledge at the specifics of the educational activity; the limits of competences are complex, cognitive - given by the results of the tenure and affective-motivational exams, of "attitude" and "enthusiasm" in teaching perceived by the students and evaluated by the questionnaires that accompany the PISA tests.

1) A first conclusion of the present study is that the program for the initial training and continuous improvement of teachers in its current form has limited efficiency in the teaching act, understood as a complex activity of stimulating, comfortable and effective organization of student learning and educational work in general. The findings, with limited significance but consonant with the empirical social perception, show that the early teacher training program leads to significantly better results than the program offered optionally, additionally and in parallel with the specialized training. 75% of ISCED 0 & 1 teachers obtain competitive results in the tenure exam in the analyzed year and only 7% obtain marks below the pass limit. Compared to them, ISCED 2 & 3 teachers obtain only 55% competitive results, and the share of non-passable results is 17%.

The results of the teachers who teach exam subjects from the National assessment scheme, Baccalaureate and the topic of PISA tests are superior to the performance of teachers of vocational disciplines - physical education, sports, arts. The difference is especially evident at the non-passing rate by 20 percentage points lower for teachers of basic subjects than for teachers of vocational subjects (Table 4).

Regarding the results of the teachers who teach exam subjects, Fig. 3 and Fig. 4 show a distribution of approximately 60% good and very good results, respectively 40% poor and critical results of the teachers of disciplines that enter fully, but not exclusively in the subject of PISA tests; the situation suggests a parallel interrogation of the problems of the education system both in terms of school education on the one hand, and the initial training and the continuous evaluation system in order to promote teachers on the other hand.

The result indicates a harmful organizational culture of value hierarchy of disciplines according to an artificial, pragmatic criterion that pursues school results on medium-term - the success rate of the school in national exams, and concerns the interests of most students, but obviously not of all. This ranking induces professional searches for compensation on alternative careers, defensive attitudes, tolerance of compromises among teachers - for example "giving up"

classes for more Mathematics / Romanian Language in the final years - and low self-requirements for teachers of vocational disciplines, with long-term effects on healthy living and artistic culture in the population.

2) The difference in performance between obtaining the bachelor's degree and the Tenure exam of the group of ISCED2 & 3 teachers analyzed in this study, raises the issue of initial motivation, choice for the educational profession, respect for the professional image of teachers, but also the ability to stimulate the intellectual potential of teachers by the education system in general and continuous assessment systems for promotion and mobility. The enormous percentage of 76% of those who do not use their entire intellectual capacity to maintain educational performance at the level of their own intellectual potential seriously questions the quality of the system in terms of highly qualified human resources management and its tolerance to average performance among teachers, reflected in the students' school results.

Professional experience in general and teaching experience in particular is recognized as an important resource for increasing the competence and quality of professional activity. The data in this study are only partially consistent with this principle; there are significantly weaker results in the category of aspiring teachers, those with no other experience than that acquired in university during the psycho-pedagogical training programs. There are no significant differences between people with 1 - 3 years of experience and expert teachers who have obtained at least Basic teaching certification, an unnatural phenomenon that needs to be studied in depth.

3) The worst finding is that despite the measures of improving "on the go" of initial training of teachers by moving from a brief module of initial psycho-pedagogical training to a consistent program of two modules structured on two levels of specialization, enriched with numerous continuing education programs authorized and credited, as well as numerous exchanges of local experience through the Teaching-Staff Resource Center and international funds by European programs, in 10 years the share of early school leaving has not improved, on the contrary there seems to be a slight growth. We hypothesize that this situation is due to a formal school management, characterized by through defective communication and institutional cooperation with the local authority.

Based on these findings, the proposal for a consistent revision of the teacher training strategy should be taken into consideration, based on scientific research, even in parallel with the national experiment to implement the master's degree, as we appreciate that the vulnerable points of training remain open: motivation for teaching career, structuring the specialized scientific discourse on the didactic principles, focusing the whole system of thinking,

attitude and behavior on the specifics of the age peculiarities of students, puberty and adolescents in the case of teachers in lower secondary and high school cycle. The professionalism dedicated to teaching, starting with the bachelor's studies, would largely solve the problem of selection and access to the system would be granted only to those interested and with a vocation consistently cultivated for this profession. The need for a rigorous and complex research to substantiate a model of initial and continuous training is obvious, a system of periodic evaluation and promotion that aims not only at the didactic dimension, but also at the motivational and vocational level of teachers throughout their careers.

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PENTRU FORMAREA VOCAȚIONALĂ A PERSONALULUI DIDACTIC DIN ÎNVĂȚĂMÂNTUL GIMNAZIAL ȘI LICEAL

(Rezumat)

Studiul de față aduce în atenție posibila legătură între calitatea personalului de predare din sistemul de învățământ preuniversitar și rezultatele elevilor. În acest sens, sunt prezentate în paralel rezultatele publice la examene naționale și internaționale, anume Evaluarea națională la sfârșitul clasei a VIII-a, testarea PISA și Bacalaureatul, respectiv Examenul-concurs național de Tituarizare pentru profesori. Constatările arată anumite similitudini între rezultatele elevilor și profesorilor la nivel general. Analizele rezultatelor profesorilor arată că programele de licență pentru pregătirea profesorilor dau rezultate mai bune decât programul opțional de pregătire psihopedgogică, profesorii care predau discipline de bază și de examene obțin rezultate mai bune decât cei care predau discipline vocaționale, o minimă experiență profesională are impact semnificativ asupra rezultatelor profesorilor, dar creșterea experienței și obținerea gradelor didactice nu sunt generatoare de creștere semnificativă a rezultatelor la examenul de Titularizare. Cauzele probabile sunt de natură sistemică, de management școlar, respectiv de strategie națională de pregătire inițială, evaluare în vederea promovării și mobilității profesorilor.