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Evaluating learning strategies in high school students

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Abstract. This study aims to address the assessment of learning strategies, as they are considered to be particularly important in the educational process. The principle of the theory that supports the substance of our work is that the educator and the educated are agents who become effective only in conditions of individual and bilateral co-balancing, in a common pedagogical field, determined by a number of variables specific to school space and time. The quality of the didactic act is measured by the efficiency of the training of students' personality competencies, context in which the combination of classical, traditional and modern strategies, according to the principle of complementarity, is a requirement and at the same time an essential condition of teaching and learning. Educational disciplines acquire educational strength through the action of teachers who use methodological and psychopedagogical knowledge operationalized in specific ways and techniques of action as a defining element of professional competence, methodical training makes it possible to transform general principles into teaching strategies, design realization and evaluation techniques.

Keywords. Assessment, strategies, learning, students, high school

1. Educational assessment

Educational assessment refers to the education system and is an important moment of teaching activity and is an opportunity to validate the amount of knowledge acquired..

Assessment is a complex didactic process, structurally and functionally integrated in the instructive-educational activity. In Ausubel's opinion, it is the final point in a sequence of events that includes the following steps: setting pedagogical goals and objectives, designing and executing the program to achieve the goals, measuring the results of the application of the program. The role of the evaluation actions is to know the effects of the action carried out, so that based on the information obtained, the activity can be improved and perfect in time.

The evaluation process is also a starting point, because the activity is adapted to the needs of education and the real possibilities to satisfy, the educational process thus acquires a cyclical structure, and the evaluation plays a regulatory role. (by Ausubel, P. D., Robinson R. F. 1981)

The purpose of assessment is all the better achieved, as we manage to make students receptive and understand the importance of school assessment, so that they take seriously the solving of the proposed tasks, to awaken their motivation for knowledge and the desire to solve correctly the stated problems. Understanding it as a useful exercise for learning and not as an actual evaluation involving emotions, especially since it's results are not recorded in the catalog,

students can freely and expressly focus on solving the proposed items and thus its results can reflect objectively if the students have the necessary training to create the favorable premises for a new learning. (by Cucoş Constantin, 2006)

The initial assessment is made at the beginning of a training program and is intended to establish the level of preparation of students at this time, the conditions under which they can integrate into the following activity. It is one of the premises of the training program. Knowing the students' learning abilities, the level of training they start from and the degree to which they master the knowledge and skills necessary to assimilate the content of the next stage is a decisive condition for the success of teaching. This relationship becomes evident in the situation when the teacher begins the activity without knowing the potential of the students, at the beginning of a school year, as may be necessary during the program, at the beginning of some chapters as well as each lesson. In all cases, it precedes the activity in which the students are engaged. (by Marin Manolescu, 2010)

Depending on the proposed goals and objectives, we can distinguish three types of assessment:

- Formative assessment, which can be initial, continuous or final;
- Prognostic assessment, which helps guide the student / teacher in the future learning process and is performed through level tests and prognostic tests;
- Diagnostic assessment, which contributes to the improvement of the teacher's pedagogical practices, but also regulates the teaching / learning process. (by Bogdan Bălan, 2005)

Assessment is a main tool and a complex action that presents:

- The purpose of the assessment;
- The specific general objectives of the training;
- The specifics of the assessed group;
- Who is the assessment for;
- What tool is used to perform the assessment.

1.1. The assessment process

The changes of recent years and those that continue today show that school assessment is designed as a part that already belongs to the learning process.

In modern education, an important concern is the formation of general and specific competencies, which the student must show during and at the end of a training period. Focusing on skills is a major concern in recent years, which causes changes not only in teaching-learning, but also in assessment. What makes the conducting of the assessment easy is the pedagogical practice that integrates and transforms these techniques.

It currently tends towards a complex evaluation through diversified tools and a complex methodology. The range of assessment methods used by teachers has expanded, because of combining traditional methods with new, modern ones that are actually alternatives in the current educational context.

Assessment serves as a tool for analyzing the effectiveness of the school curriculum and changes at all levels. Its focus on student results does not provide indications of the reasons why the approaches used by teachers are or are not effective. There is a need to evaluate the whole assessment-learning process in order to improve the processes that help to remedy the performance in teaching-assessment.

Assessment is a complex didactic act that includes three interdependent operations:

- Verification is the action of establishing the quality of theoretical and practical knowledge acquired by students by the teacher;
- Valuation is the operation of estimating the level of preparation at which the student is;
- Scoring is what determines the admission or rejection of the evaluated one. Scoring is the conclusion that emerges from the interpretation of the related data.

The regulation of the didactic process implies not only the knowing of the results, but also their explanation by factors. Therefore, assessment means an intervention with real valences to stimulate training / learning.

Assessment must be understood by students not only as a way of verifying knowledge, but also as a way to improve. Assessment is an integrated act of pedagogical activity, but also a means of delimitation and fixation on the contents.

„It is expected that the impact of the assessment on the design and implementation of the educational process can be compared with that produced by the introduction of the computer in school and which led to the expression "computer-assisted learning". Thus, the importance and need for an assessment to guide the activity has become so pressing that the phrase "assessment-assisted learning" is frequently used.” (B. Maccario 1996)

The assessment, in the educational activity, is imposed in different reasons, which derive, on the one hand from the internal requirements of the system, and on the other hand from the interdependence of education with the economic-social development.

From a pedagogical point of view, the evaluative approaches serve the system and are carried out as component actions of the educational activity. The role of the assessment consists in emphasizing the successful aspects, but also the difficulties and critical areas of the realized program, so that in the end it is possible to take regulatory measures in order to make the educational act as practical as possible..

The teacher of today's school has as its mission the integration of the specific elements of assessment in the didactic activities, from their design and organization to their realization.

2. Learning strategies

Learning through "knowledge - product", as stated by I. Neacșu (1999), aims at the idea of transmitting culture. The truths that education proposes to be assimilated / learned are seen especially as goals, objectives, and not changes, transformations. Dominant is the cognitive, and only then, the affective. The clear distinction between the educator and the educator is promoted. The formal dimension of educational relations prevails and subordinates the informal dimension. Educational practices are strongly divided, the contents are rigorously institutionalized in plans and programs. (I. Neacșu, 1999, p.18).

Learning strategies refer to the procedures used to facilitate the learning process, they refer to rules and principles that are used and reproduced in the learning material..

It is good and important to realize as soon as possible the importance of identifying the use of different learning strategies.

Unfortunately, most of the time students who have a high learning potential fail to achieve high school performance because they do not know how to learn. In most cases, students who do not have optimal learning strategies have poor school results, which can lead to a negative self-image, to maladaptive emotional and behavioral reactions such as isolation, aggression, depression, frustration; these reactions contribute to the formation of a vicious circle, which results in a continuous decrease in school results. As a result, a large proportion

of students will develop a negative attitude toward school and learning, school motivation to learn will decrease, and in some cases, some will drop out of the education system.

Learning strategies in the educational environment refer to behaviors aimed at recapitulating and learning a material and the regular use of procedures.

Significantly, learning strategies contribute to the development of a student's ability to encode and extract information.

Of course, there are many strategies through which a subject can be learned. The perfect strategy is one that matches the type of content and the characteristics of the person. We meet students who do their best, but the results are not commensurate with the effort made by the student. The most effective learning strategies are based on the person's ability to understand, develop and structure the material they want to learn.

2.1. Models of learning

Psychologists have tried to give an adequate explanation for the way in which learning takes place, as they are numerous and diverse.

Psychologist R. Gagné constructs a hierarchical classification of learning. These are eight types of learning, well known in the literature, in which the higher level is complex and is based on the acquisition of the lower ones. Thus, as R. Gagné says (according to D. Sălavăstru, 2008), "a student is ready to learn something new when he has acquired, through previous learning, the skills necessary for the next step" (p.267). The eight types of learning, according to R. Gagné's classification, are (pp. 266-268):

- learning signals;
- learning stimulus - response;
- chain learning;
- learning through verbal associations;
- learning through discrimination;
- learning notions;
- learning the rules;
- problem solving.

Signal learning: it is involuntary learning. It is specific to the life of each of us and is related to our primary needs. It is about Pavlov's conditioned reflex: a response behavior, conditioned by the appearance of a signal.

Stimulus-response learning: brings an addition to the previous type of learning, in the sense that at this level the subject gives a specific response to a given stimulus, and is able to perform exactly a delimited action. S-R learning is involved in learning voluntary motor acts (according to D. Sălavăstru, 2008, p.267).

Chain learning: it is also called sequence learning and refers to learning a series of stimulus-response behaviors, which are in a certain determined sequencing. Learning through verbal associations: has the same form, but refers to verbal sequencing.

Discrimination learning: means learning to respond differently to characteristics of objects that help in / distinguishing them. Learning to discriminate is a very important thing for the training process.

Learning notions: the formation of notions and concepts is an important moment in the act of training. This type of learning involves the student's ability to classify objects based on common properties. It is important to mention the role of language in acquiring this type of learning.

Learning the rules: refers to learning a chain of several concepts, notions. This type of learning is based on learning notions. Learning rules is found in a large proportion in school learning.

Problem solving: it is based on thinking, learning and applying the rules. Moreover, it is a process that generates new learning.

The effectiveness of learning depends on a multitude of conditions and situations. They are ordered in two ways: internal conditions and external conditions. Internal conditions refer to the intellectual possibilities of learners, their motivation and interest in learning. External conditions include all the circumstantial elements in which learning takes place. (by Mihaela Sudiu Interactive Teaching-Learning Methods)

2.2. Individual learning differences

In a general sense, the personality attribute is granted only to individuals who have stood out and imposed themselves through achievements in different fields. The fundamental idea in psychology is that each individual is a personality, which is structured and formed in different rhythms throughout life.

Personality comprises in terms of its structure typological variables, general and individual, which are arranged in a single constellation.

In this context we offer two of the definitions of human personality: "personality represents the non-repetitive unitary combination of psychic features that characterize more concretely and with a greater degree of stability the concrete man and his ways of conduct" (according to Al. Roşca, 1976, p. 466); "Personality is a summative construct that includes thoughts, motives, emotions, interests, abilities, etc."

From these definitions we draw the conclusion that personality gives man its own personality, uniqueness, expression of a certain combination of its internal variables. All this registers an individual character in the learning process. The general mechanisms of this process differ from one student to another. (according to Ioan Bontaş, 2001)

3. Research methodology

3.1. Objectives

O.1. Identify learning strategies used predominantly in high school students from different profiles.

O.2. Confirmation of differences in the development of testing strategies between technics focused high school students and humanities focused high school students.

O.3. Highlighting the fact that humanities focused high school students possess more developed organizational techniques than technics focused high school ones.

O.4. Demonstrating that technics focused high school students manage time better than humanities focused high school students.

O.5. Identifying a possible positive correlation between study strategies and extroverted, conscientious, kind, autonomous and emotionally stable personality traits.

3.2. Assumptions

- It is assumed that technics focused high school students are better able to develop test-solving strategies than humanities focused high school ones.

- It is presumed that students from the humanities focused high schools possess better developed organizational techniques than those from the technics focused high schools.

- It is presumed students in the technics focused high school profile are presumed to be able to manage their time better than those in the humanities focused profile.
- It is assumed that there is a positive correlation between personality traits and students' study strategies.

3.3. Study participants

The research was carried out on a sample of 48 subjects, 20 students in the 11th grade - from the Theoretical High School „Ion Creangă” Tulcea, humanities focused profile and 28 students from the Economic College "Delta Dunarii" Tulcea with technics focused profile.

The students participated in the study on a voluntary basis, being motivated by the desire to find out the research results.

3.4. Research variables

The variables investigated through this study are:

Study strategies, they are behaviors focused specifically on the recapitulation and learning of a material, such as the regular use of mnemonics and other memorization mechanisms. These are strategies that contribute significantly to developing a student's ability to extract information.

Test Strategies (TEST) are specific strategies, which manifest themselves in the form of behaviors actually used during an assessment. They focus on applying and developing strategies to succeed in a test, this leads to improved school performance. The purpose of the test scale is to measure and assess the extent to which the student knows and applies strategies during a test.

Organizing techniques are specific strategies used to organize the materials to be learned, ranging from preparing for each class to writing homework. They assess the student's practices regarding the organization of study materials and those used at school, as well as the organization of homework.

Time management techniques, this strategy is a metacognitive technique that involves recognizing the most effective ways to use available time. Acquiring time management skills since high school or even earlier can have a strong impact on the student's motivation to complete academic tasks. This ability helps to gain control and facilitates the transition to less and less structured learning situations.

3.5. Research tools

To achieve the proposed objectives we used two research tools.

1. SMALSI - a learning strategy assessment questionnaire, designed to assess ten main constructs associated with school motivation and learning strategies, seven of which focus on the student's strengths and three on his or her weaknesses.
2. Five-Factor Personality Inventory (FFPI Questionnaire) evaluates the five superfactors in the Big Five model: Extraversion (E), Kindness (A), Conscientiousness (C), Emotional Stability (S) and Autonomy (D).

3. Analysis and interpretation of results

Tab.1 Table for average equality

	Profile	N	Average	Std. Deviation	Std. Error Mean
TEST	Humanities	20	24.40	6.012	1.344
	Technics	28	31.32	6.248	1.181
ORG	Humanities	20	25.60	5.906	1.321
	Technics	28	20.46	6.368	1.203
TIME	Humanities	20	23.6000	6.34450	1.41867
	Technics	28	27.9643	6.02760	1.13911
CONSCIENTIOUSNESS	Humanities	20	70.60	5.698	1.274
	Technics	28	66.57	7.325	1.384

Hypothesis 1 is confirmed, at a significance threshold $p = 0.046$ (sig 2) Tab.III.2, in the sense that students from a humanities focused profile are more conscientious ($m = 70.6$) Tab.III.1 than those with a technics focused profile ($m = 66.5$). To confirm the hypothesis, we used the Five-Factor Personality Inventory (FFPI Questionnaire) as a tool.

Hypothesis 2 is confirmed, namely that students from the technics focused profile are better able to develop test solving strategies (average = 31.3) Tab.III.1 than those from the humanities focused profile (average = 24.4), to identify differences between the two profiles, we used the SMALSI questionnaire - learning strategies.

Hypothesis 3 is confirmed, at a significance threshold $p = 0.007$ (sig 2) Tab.III.2, students from the humanities focused profile possess better developed organization techniques ($m = 25.6$) Tab.III.1 than those from the technics focused profile ($m = 20.4$). To identify the differences in the ORG variable, we used the SMALSI questionnaire as a tool.

Hypothesis 4 is also confirmed, at a significance threshold $p = 0.021$ (sig 2) Tab III.2, namely that the students from the technics focused profile manage the time better and more efficiently ($m = 27.9$) Tab .III.1, than those from the humanities focused profile ($m = 23.6$). To see a difference between the two profiles in the TIME variable, we used the SMALSI questionnaire - learning strategies.

Hypothesis 5 is confirmed, at a significance threshold $p = 0.001$ (sig 2) Tab.III.2, namely that there is a positive correlation between study strategies and personality traits, extroverted, kind, conscientious, autonomous and with high emotional stability . As a tool used, we used the Five-Factor Personality Inventory (FFPI Questionnaire) and the SMALSI questionnaire - learning strategies.

Table 2. T test for independent samples

		Testul Levene pentru egalitatea variabilelor		Testul t pentru egalitatea mediilor						
		F	Sig.	T	Df	Sig. (2-tailed)	Diferența mediei	Diferența a erorii standard	95% intervalul de încredere al diferenței	
									Inferior	Superior
TEST	Equal variances assumed	.051	.823	-3.843	46	.000	-6.921	1.801	-10.547	-3.296
	Equal variances not assumed			-3.868	42.024	.000	-6.921	1.789	-10.532	-3.310
ORG	Equal variances assumed	.051	.823	2.838	46	.007	5.136	1.810	1.493	8.779
	Equal variances not assumed			2.874	42.859	.006	5.136	1.787	1.532	8.739
TIMP	Equal variances assumed	.002	.968	-2.420	46	.020	-4.36429	1.80360	-7.99475	-.73382
	Equal variances not assumed			-2.399	39.765	.021	-4.36429	1.81940	-8.04210	-.68647
CONSTIINCIOZITATE	Equal variances assumed	2.165	.148	2.053	46	.046	4.029	1.962	.079	7.978
	Equal variances not assumed			2.141	45.610	.038	4.029	1.881	.241	7.816

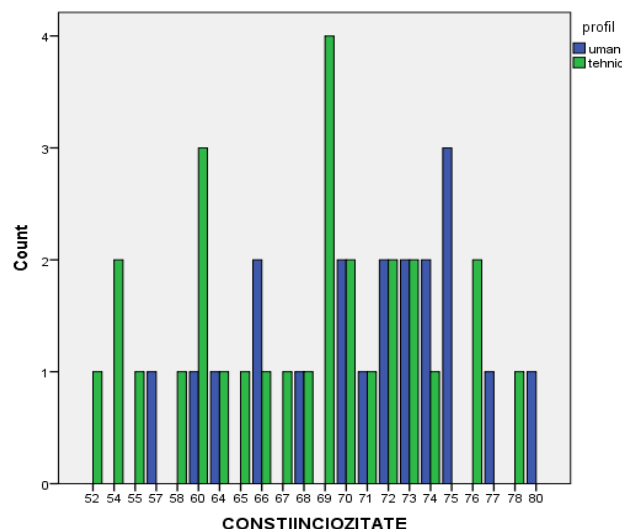


Figure 1. Conscientiousness

Following the interpretation (figure 2) we can say that humanities focused students make progress in mental activity, developing better learning strategies and training their attention in order to progress. Because they receive a lot of information, human beings have to develop their ability to identify important information, to make connections during the learning process and

automatically become more aware. Those who study are considered responsible for the activities they carry out. Thus, students take initiatives in their own learning experiences.

Conscientiousness being a personality trait, we deduce that students from the human profile make a sufficient effort for learning and homework, unlike students from the technical profile who after completing personality questionnaires and learning strategies resulted in not being in a good enough mood to be willing to look for information they do not understand, or to read, such as those in the humanities focused profile.

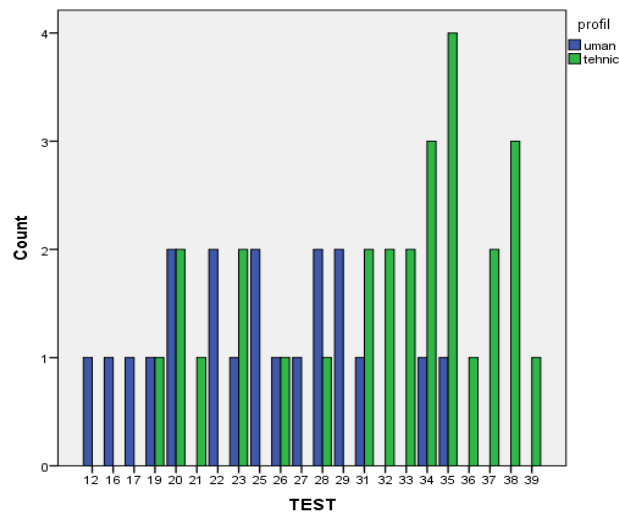


Figure 2. Test

Figure 2 shows that those in the technics focused profile know better how to eliminate the unlikely answers, to write down the key elements extracted from the questions and especially the time management during the test. Unlike those in the humanities focused profile who did not score high in our research, and this indicates that students in this profile do not accurately demonstrate their level of knowledge or mastery of the content.

Students who get a low score on the TEST scale, in our case those from the humanities focused profile do not resort to a strategy during a test, very often try to guess the answers. At the same time misperceive certain important elements of the test solving instructions.

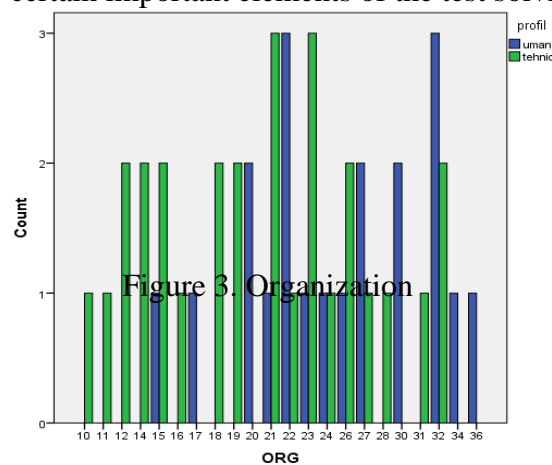


Figure 3. Test

We realize if we look at figure 3 that the students from the humanities focused profile obtained a better score compared to those from the technics focused profile, in the sense that, from the point of view of the organization of the materials, the ones from the humanities profile know how to elaborate better the materials to be learned. Unlike those from the technics focused profile who have difficulty organizing study materials, such as notes or other resources.

Organizational strategies, objects and ideas prevent the emergence of low academic difficulties due to lack of organization.

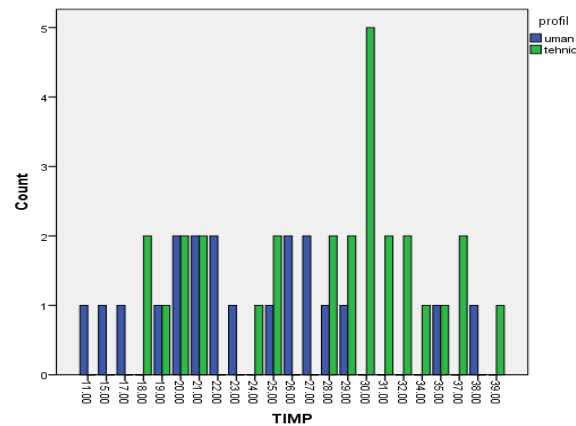


Figure 4. Time

Figure 4 shows a difference in the TIME scale between the two profiles. As you can see, the students from the humanities focused profile do not manage time as well as those from the technics focused profile. It seems that the students from the technics focused profile distribute the time corresponding to the tasks, they schedule their time quite well for the preparation of a given task during the class or at home.

From here we can say that the ability to manage time in high school students has an important impact on a student's motivation to complete a homework, to master it and know it, which will facilitate his transaction through different environments. school and personal.

There is a positive correlation between study strategies and personality traits at a significance threshold of 0.001 (sig 2) (extraversion, 463 **, kindness, 556 **, conscientiousness, 556 **, autonomy, 376 **, emotional stability, 405 **).

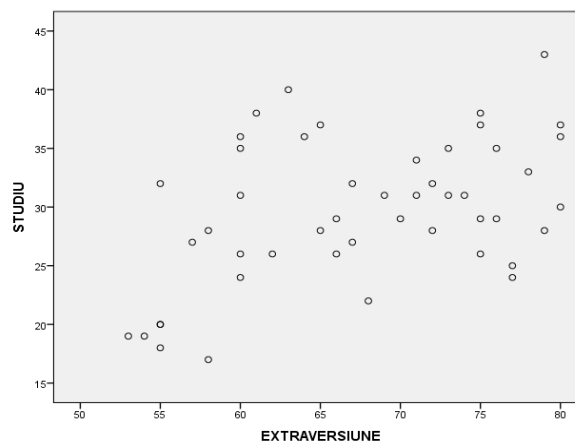


Figure 5. Extraversion

In most cases, extroverted students are attracted to study groups, they really like to explain but also to listen to the explanations of others. Extroverted students actively participate in conversations during classes, prefer to learn in the community, they connect with everything they hear or read, with a personal experience. Learn by deepening the theoretical notions with the help of textbooks. Outgoing students think while talking, they need to socialize because it stimulates their thinking.

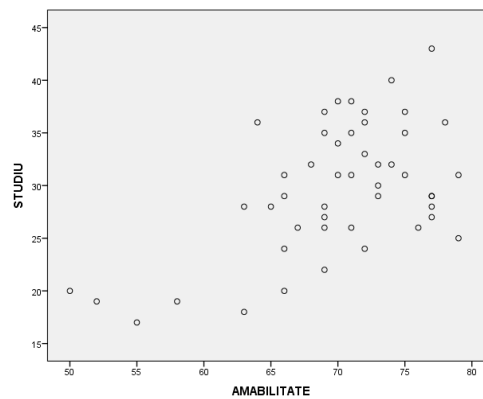


Figure 6. Kindness

Following the correlation, it is found that kind students also create effective study strategies.

Kind students take into account the opinions and rights of others. Try to be on good terms with others. Because they are kind, they are better liked by the teacher and better master their study strategies.

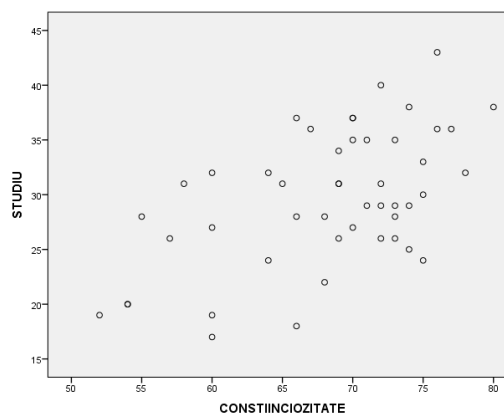


Figure 7. Conscientiousness

People who are conscientious know how to use study strategies as well, after applying the SMALSI and FFPI tests, it turned out that there is a positive correlation between the two. Conscientious students are perfectionists, they follow rules and regulations. Because they plan their actions on their own, they learn by using memorization and coding strategies. Thus, by applying this learning strategy, conscientious also being trusted people develop their own ability to select important information from a document they have to learn.

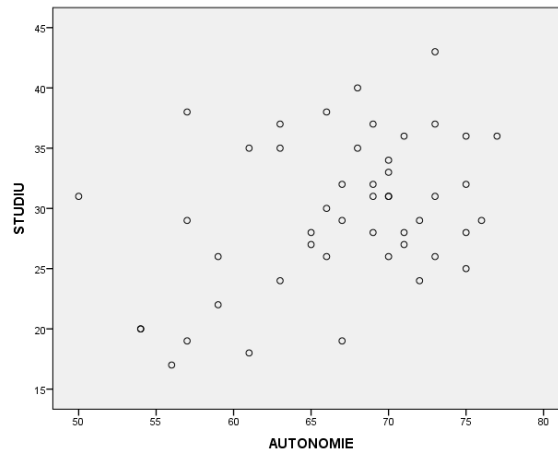


Figure 8. Autonomy

Following the interpretation of graph 8, we notice that students who have an autonomous personality use as learning strategies, study strategies. Students with an autonomous personality are told that they are creative people, who do not let themselves be led by anyone else, so it is very easy for them to form their own learning strategies.

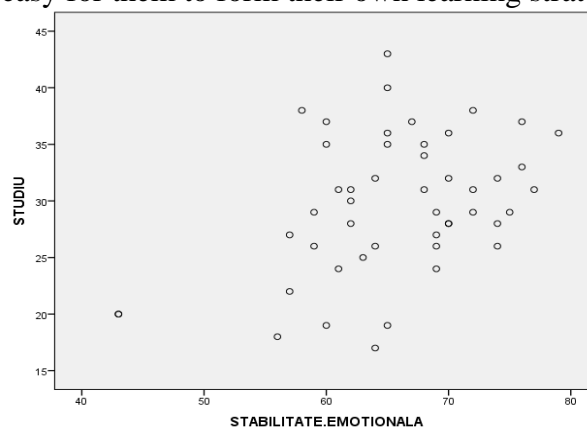


Figure 9. Emotional stability

Figure 9 shows that students with good emotional stability use learning strategies as study strategies. It seems that students who think positively use memorization techniques, they make connections during the assessment process, they trust their own strengths. There are people who use information logically, and control their emotions well.

Conclusions

This research was conducted out of a desire to know how good it is to realize the importance of evaluating and identifying the use of various learning strategies in relation to the type of content and characteristics of the person. The interest shown and the existing studies towards the learning strategies, were directed to a small extent on the primary and secondary school students, in order to improve the preparation for college.

Given the many learning strategies and the importance of knowing when to use them during the learning process, there will be some pressure on the teacher to understand the similarities between the children and accept the differences. There are multiple learning

strategies and many things are known about them, more or less effective. Goal setting, concentration, automation and flow practice are the most effective strategies. These strategies apply to students just as they apply to teachers. All children can be taught to practice and focus only if the benchmarks are transparent and if there is enough formative feedback to move on.

The key to understanding the learning process is for it to be taught so that the student can learn how to control and monitor their own learning. This involves learning how and when to apply a learning strategy, and especially how to assess how effective the strategy has been in improving learning. Teachers need to develop the skills of lower speaking students, to assess success in understanding and mastering the learning process. Teachers need a deliberate commitment to learn, practice and develop learning skills.

All students, regardless of skills or circumstances, certainly benefit, from an academic point of view, from the development of effective learning strategies. Many researchers have argued the need for educational intervention for children who have problems with information acquisition or learning disabilities. Therefore, a careful assessment of learning strategies is needed to see what the exact nature of the deficit of a particular child is, as well as the strengths that could be explored.

Hypothesis 1 is also confirmed following the application of the Five-Factor Personality Inventory questionnaire (FFPI Questionnaire), where humanities focused students are more conscientious than those in the field of exact sciences at a significance threshold $p = 0.046$.

Hypothesis 2 is also confirmed, in which students from the technics focused profile manage to develop better test solving strategies than those from the humanities focused profile. We can say about technics focused students that testing strategies demonstrate how students learn and how effective the techniques they use are.

Following the graph no.III.3 we say that hypothesis 3 is confirmed at a significance threshold $p = 0.07$, namely that students who come from high school with a humanities focused profile, possess better organizing techniques than those from the technics focused profile. We can say that this is also due to the fact that most humanities focused profile students are girls, and girls are better organized than boys.

Hypothesis 4 is also confirmed, namely that the students from the technics focused profile manage the time much more efficiently at a threshold of significance $p = 0.21$ than those from the humanities focused profile. Technics focused students are people who share time better for tasks, are more pragmatic than humanities focused students who are thinking people and who prefer to meditate on things.

We aimed to highlight a correlation between a certain type of learning and personality traits. The results indicated a positive relationship between the STUDY variable and the extroverted, kind, autonomous, conscientious students with a high emotional stability at a threshold of significance $p = 0.001$. Hence, we say that the present research also led to the confirmation of the hypothesis according to which students with positive traits use as learning strategies the identification of important information (STUDY scale), to make associations while learning, to use a variety of resources when they do not understand. In the area of literature dedicated to the subject, the present study makes a contribution by researching the variables in the context of selecting the sample from classes with different profiles. In order to develop effective learning strategies, they must take into account the specific cognitive profile of each child, including the preferred sensory ways of processing, selecting and elaborating information. The psychological evaluation of the learning style can bring useful information for identifying the most appropriate learning strategies and adapted to the profile of each child.

The perfect learning strategy for each student differs, it depends on the characteristics of the student and the type of material he has to learn. The most effective learning strategies are based on the student's ability to develop and structure the material he wants to learn, and his motivation. Also, the highlighting of some differences between the students from the humanities focused profile and the students from the technics focused profile at the TEST, ORG and TIME scales and the relations between the learning styles and the personality traits of the students represent the novelty brought by this research.

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