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Methods used in the Educational Process: A Theoretical and Empirical Perspective

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Abstract

In the context of an evolving and developing educational system based on a social reality, the diversification of the curriculum in higher education, and not only, required the introduction of new modern teaching and learning methods and techniques without renouncing at the most valuable classical ones. "The method" is defined as the path or working modality used by teachers and students in teaching interaction to achieve the proposed educational goal. Methods serve cognitive and formative goals of education.

We will analyze with priority the methodology for teaching in the socio- humanistic disciplines. One classification of the methods used in the educational process was made by Dale and is known in the literature as "Dale's Cone of Experience". We can also find another similar classification under the form of an instrument named "The Learning Pyramid". We conducted a research using the opinion survey, based on a questionnaire using a representative sample of students from 3 specializations from University of Craiova: International Relations and European Studies, History and Sociology. Through this research we aimed to identify how students from the three specified specializations would classify of the audio-visual methods found in "Dale's Cone of Experience" and "Learning Pyramid", depending on the manner in which this methods influence their learning process.

Keywords: "Dale's Cone of Experience", "The Learning Pyramid", Educational Process, Teaching and Learning Methods and Techniques.

Introduction

In the context of an evolving and developing educational system based on a social reality (Nistor, 2017), the diversification of the curriculum in higher education, and not only, required the introduction of new modern teaching and learning methods and techniques without renouncing at the most valuable classical ones.

As didactics (Joita, 1994) is that specialized part of pedagogy, which deals with the study of the educational process, with defining the objectives, principles, methodology and evaluation of the instructional-educational process (Dinulescu, 2009), it becomes clear that also the new

teaching and learning processes having as basis a formal, well - structured framework, refer to and borrow from those traditional didactic methods and techniques, instructional and educational adaptable and applicable methods, in an optimal framework, to the new processes.

Obviously, like any dynamic discipline, didactics also evolves with the needs of contemporary society, so new methods and modern techniques come to complement the classic ones for a more precise adaptability to new curricula.

Analyzing the classical methods of didactic teaching and still proving their usefulness but also their modernizing evolution, this study aims to illustrate how different teaching and learning methods are perceived by students, based on the famous *Dale's cone of experience* and the *Learning Pyramid*, so that the "teachers", who are for the first time facing such a challenge, that of teaching, to have a real and effective perception of the actual state, but also practical support in the successful implementation of the proposed didactic task.

About the methodology used for teaching in the socio-humanistic disciplines

To achieve the proposed and above stated objectives, we will analyze with priority the methodology used for teaching in the socio - humanistic disciplines.

The term "methodology" is the one designating a set of procedures and methods that are used in the instructional - educational process. To organize the "teacher - student" educational activity, there must be identified optimal methods for the implementation of the operations used in learning, that will be used in achieving planned goals. The methods are those "theoretical - actionable teaching - learning - evaluation approaches meant to ensure with maximum efficiency acquisition of knowledge and building of capacities designed to the objectives, as well as their evaluation. They act, therefore, as cognitive and training goals of education" (Albulescu & Albulescu 1999).

The method is defined as the path or working method used by teachers and students in the didactic interaction to achieve the educational proposed goal (Capita & Capita, 2006).

Placing the in the center of the learning operation involves certain methods that must be applied to achieve the task, a specific method to obtain the competence presented in the objectives. Some methods task more the teacher (exposition, lecture), other methods task more the student (individual or collective reading, exercise), while others involve those kinds of teaching activities that involve both teacher and students (problem solving, heuristic approach) (Albulescu & Albulescu, 1999).

The active-participatory methods are: Problem solving, Heuristic approach, Learning by discovery. In the professional literature we find 11 types of discovery: Inductive discovery, Deductive discovery, Analogical discovery, Collective discussion, Group work, Case study, Brainstorming, Algorithmic formulation, Exercise, research theme and essay, Individual reading and Personal reflection.

Of the expository methods we can include: Story as narration or description, Explanation, Description, Lecture.

The psycho-pedagogical researches are those that reveals that, the active - participative methods are more efficient, because in this way the student is more than just a receiver, he becomes an object of action and knowledge, this aspect reducing the importance of the expository methods, while maintaining their importance, however, modern teaching supports active - controlled education. Authors such as Piaget, Galperin or Gagne have showed that

intellectual development is achieved through the use in the education / learning process of some methods that cultivate creative thinking, initiative, imagination, responsibility of tasks and capacity for cooperation (Albulescu & Albulescu, 1999).

An active course uses active methods, putting thus into value the student's spontaneous need for activity, which frees him from constraint and thus associates him to his own training (Mory, 1971).

About "Dale's Cone of experience" and "The Learning Pyramid"

A classification of methods used in the instructional-educational process was conducted by Dale and imposed itself in the professional literature as "Dale's cone of experience". A similar hierarchy, more recently, was developed by the "National Training Laboratories in Bethel-Maine" and is known under the name of the "Learning Pyramid".

"Dale's cone of experience" is a "visual model" and is designed to make a summary for the different kinds of mediated learning experiences that he imposed. When Dale studied teaching and learning methods, he observed that indirect and direct and direct experiences could be presented as "imaging device" in a pyramid or that he called the "Cone of Experience".

Edgar Dale described in 1946, in his book *Audio - Visual Methods in Teaching*, published by Dryden Press - New York, the original labels for the ten categories of learning and teaching methods: Direct - Purposeful Experiences/ Contrived Experiences/ Dramatic Participations/ Demonstrations/ Field Trips/ Exhibits/ Motion Pictures/ Radio - Recordings - Still Pictures/ Visual Symbols and/ Verbal Symbols.

Figure no. 1. Dale's Cone of Experience - 1946



Source: Dale, E. (1946). *Audio-Visual Methods in Teaching*. New York: Dryden Press.

In 1954 the second edition of the book *Audio - Visual Methods in Teaching* was published. In this edition, the cone is a little modified, in the sense that television is added, and he changed Dramatic participation to Dramatized experiences, and thus, the labels in the cone become: Direct - Purposeful Experiences/ Contrived Experiences/ Dramatized Experiences/

Demonstrations/ Field Trips/ Exhibits/ Television/ Motion Pictures/ Recordings - Radio - Still Pictures/ Visual Symbols and/ Verbal Symbols.

Figure no. 2. Dale's Cone of Experience - 1954



Source: Dale, E. (1954) *Audio - Visual Methods in Teaching (revised edition)*. New York: A Holt-Dryden Book, Henry Holt and Company.

The book's third edition appears in 1969. In this variant, the cone is again a little modified, educational television taking the place of television and Study trips the place of Field trips, thus the labels in the pyramid are: Direct - Purposeful Experiences/ Contrived Experiences/ Dramatized Experiences/ Demonstrations/ Study Trips/ Exhibits/ Educational Television/ Motion Pictures/ Recordings - Radio- Still Pictures/ Visual Symbols and/ Verbal Symbols.

Figure no. 3. Dale's Cone of Experience-1969

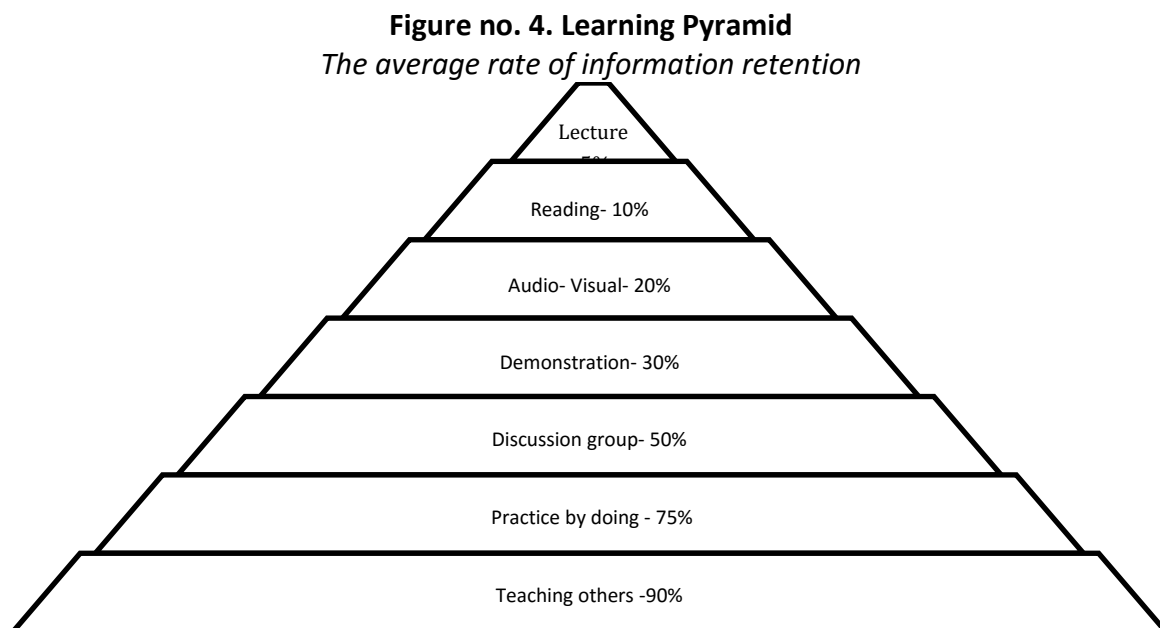


Source: Dale, E. (1969). *Audiovisual Methods in Teaching (third edition)*. New York: Dryden Press, Holt, Rinehart and Winston.

In 1957, Edgar Dale explained that the cone does not represent a “perfect or mechanically flawless picture with absolute value and *literal* translation”. He also pointed out that the cone “explains the relationships between various types of audio-visual materials and their individual positions in the process of learning”, emphasizing that it would be an error to consider the bands from the cone as immutable sections.

In his book, edited in 1954, Edgar Dale explained that the cone instrument represents a “visual metaphor of learning experiences, in which the different types of audio - visual materials are arranged in ascending order with respect to the direct experience, depending on the abstraction degree of each method” (Dale 1954).

A model with “Dale’s cone of experience” is the “Learning pyramid” developed by the “National Training Laboratories in Bethel, Maine”, where the retention rates are shown in different percentages, in terms of the teaching techniques. There are many similarities between the two models.



Source: National Training Laboratories, Bethel, Maine (World Bank, http://siteresources.worldbank.org/DEVMARKETPLACE/Resources/Handout_TheLearningPyramid.pdf)

The percentages 5 % -10 % -30 % -50 % -70 % -90 %

Exactly where these numbers come from is an enigma to most theoreticians. As a pattern, it seems very credible at first glance, but nevertheless many specialists in the field of education consider as unfounded these percentages. They believe that the percentages cannot be generalized, because, they say, different people retain information differently and there are persons who retain almost everything only by reading.

We must note that the figures in the models above presented are not a certainty; not being proved and thus, they can only be considered as indicative benchmarks. However, we opt for teaching methods that emphasize practice, collective discussion, role-play, and case studies.

At the same time, regarding the used materials, we will use most often power - point presentations, clips from documentaries, the video projector and the laptop.

Methodological components and the research results

We have conducted a personal research among the students of the specializations: International Relations and European Studies, History and Sociology within the University of Craiova, in order to identify the students' perception on the methods used in the educational process.

As for any sociological research rigorously underlain, the project we have conducted to develop this study, aimed at all key steps in such a research process:

1. Establishing the study problem (argument for choosing the theme),
2. Studying specialized literature study (research conceptual framework),
3. Formulating the working hypotheses,
4. Establishing research methods and techniques,
5. Determining the study population (sample choosing),
6. Data collecting,
7. Analyzing the research results,
8. Formulating the conclusions (Mihailescu 2003).

Argument for choosing the research theme

The methodology used for teaching the disciplines and in this case the socio - humanistic disciplines was extensively researched and debated topic, primarily due to the special significance it has in the instructional - educational process. Problems regarding the working method used by teachers and students in didactic interaction, relating those processes and methods that are used in the instructional - educational process, were in the researchers' constant attention.

Although it has been studied a wide range of aspects of teaching methodology of disciplines, our research focused towards a less investigated aspect, namely the students' perception on the methodology and methods used in the instructional - educational process.

****Dale's cone of experience**

"Dale's cone of experience" is a "visual model" and is designed to make a summary for the different kinds of mediated learning experiences that he imposed.

The original labels for Dale's eleven categories are: "Direct-purposeful experiences"/ "Contrived experiences"/ "Dramatized Experiences"/ "Demonstrations"/ "Study Trips"/ "Exhibits"/ "Educational Television"/ "Motion Pictures"/ "Recordings-Radio- Still Pictures"/ "Visual Symbols" and/ "Verbal Symbols".

Over time many researches have been made in terms of identifying the veracity of this cone, without emphasis on the students' perception regarding the importance of these methods in the learning process.

That is why it was necessary, from our point of view, a research in terms of identifying the students' perceptions on the effectiveness of the methods used in the teaching process.

Taking as starting point the 11 methods described by Dale in his cone, the research aims to identify, on the one hand, what is the individual position of each method in the learning

process and, on the other hand, to identify what is the importance of each method, depending on the efficiency it has in the process of teaching and learning process, from the students' point of view.

****The learning pyramid**

A similar model to "Dale's cone of experience" is the "Learning pyramid" developed by the "National Training Laboratories in Bethel, Maine" where the retention rates are displayed in different percentages, in terms of the teaching techniques.

The percentages 5% -10% -30% -50% -70% -90% found in the learning pyramid are a mystery to most. We noted above that many specialists in the field of education consider as unfounded these percentages, believing that they cannot be generalized. There were conducted debates and writings on this subject, but, just as in the case of Dale's cone, the focus was not on the students' perception regarding the information retention percentages, in terms of the teaching techniques.

Taking as starting point the seven teaching methods described in the learning pyramid, we wanted through the research to identify, on the one hand, what is the individual position of each teaching methods in the learning pyramid and, on the other hand, what is the average percentage of information retention for each teaching method, from the point of view of the students in the socio - humanistic specializations.

Research Conceptual Framework

In the conceptual framework of this research I emphasized various aspects:

- The professional literature related to the didactics, the methodology used for teaching the socio - humanistic disciplines, Dale's cone, the learning pyramid;
- Researches conducted on the teaching methodology.

We left from the theoretical analysis of the methodology of teaching the socio - humanistic disciplines, we reached the theoretical analysis of Dale's Cone of experience and the learning pyramid and we tried to identify the perception of the students from the socio - humanistic specializations, at the University of Craiova, on the efficiency of the teaching methods and the average percentage of information retention for the different teaching methods, starting from the theoretical notions founded by Dale and the National Training Laboratories in Bethel, Maine.

Formulating the Working Hypotheses

In the next section we will present the identification process of the research hypotheses and objectives:

1. The hypothesis from which we start is that the active - participatory methods are more efficient than expository methods, thus, an objective of the research is to identify students' perception on the effectiveness of the methods in the teaching and learning process.

2. The hypothesis from which we start is that the teaching methods proposed by Dale do not have a fixed position in Dale's cone, as it is presented by the author, thus, another objective becomes to identify the individual "positions" of the methods in the learning process, according to the students' estimations.

3. The hypothesis from which we start is that active - participatory methods are more efficient than expository methods, thus, an objective of the research is to identify the students' perception on the average percentage of information retention for each teaching method.

4. The hypothesis from which we start is that the proposed teaching methods do not have a fixed position in the learning pyramid, the average retention percentages may vary, as well as their position in the pyramid, thus, an objective of the research becoming to identify the individual position of each teaching method in the learning pyramid, due to the students' estimations.

Establishing the Research Methods and Techniques

Because we chose as main objectives to study the students' perception on the effectiveness of the methods used in the teaching process, we considered necessary to conduct a quantitative research, by applying a questionnaire that "allowed the examination of social facts through numerically expressed traits" (Otovescu, 2009).

We chose the method of applying questionnaires, as the purpose of the investigation was to create an image on the teaching methods, from the point of view of the students from the socio - humanistic specializations.

The applied questionnaire comprises two-closed matrix - type questions, the first question testing 11 aspects, and question number 2 having 7 aspects. This questionnaire was administered as well as self - administered.

Determining the Study Population (sample choosing)

The used investigation technique was the questionnaire, addressed to a sample of 252 respondents from the specializations International Relations and European Studies, History and Sociology (252 questionnaires).

The research is of barometer type, aiming to explain and understand some phenomena.

The Sample

The sample used for the quantitative research was of 252 students the three specializations at the University of Craiova.

According to data provided by the services of the University of Craiova, the specializations International Relations and European Studies, History and Sociology, in 2016 there were enrolled a total of 314 students, distributed as it follows:

- The specialization International Relations and European Studies - 104 students: 46 in the 1st year, 29 in the 2nd year and 29 in the 3rd year

- The specialization History - 63 students: 24 in the 1st year, 20 in the 2nd year and 19 in the 3rd year

- The specialization Sociology - 147 students: 48 in the 1st year, 35 in the 2nd year and 64 in the 3rd year

In choosing the sample of 252 people we sought that the proportion of interviewed students to be equal to their actual percentage in the specializations, so there were interviewed: 84 students in the specialization International Relations and European Studies, 50 students from the Specialization History and 118 students in the specialization Sociology.

By interviewing 252 people it was achieved a 80 % rate of investigation of all students from the three specializations, being a representative percentage.

Data Collecting

We made personally the collection of data among students, by applying questionnaires in the period of November - December 2016.

Analyzing the Research Results

In this section we will present the essential results of the opinion survey „Knowing the perception of students from the socio - humanistic specializations on the methods used in the educational process” conducted at the University of Craiova in the period of November - December 2016.

**Question number 1

On a scale from 1 to 11 (where 1 has the lowest importance and 11 the highest importance), give a mark for each of the following teaching methods, according to the effectiveness you consider it has in the learning process.

Teaching method	Mark
"Verbal Symbols"	
"Visual Symbols"	
"Recordings- Radio- Still Pictures"	
"Motion Pictures"	
"Educational Television"	
"Exhibits"	
"Study Trips"	
"Demonstrations"	
"Dramatized Experiences"	
"Contrived Experiences"	
"Direct. Purposeful Experiences"	

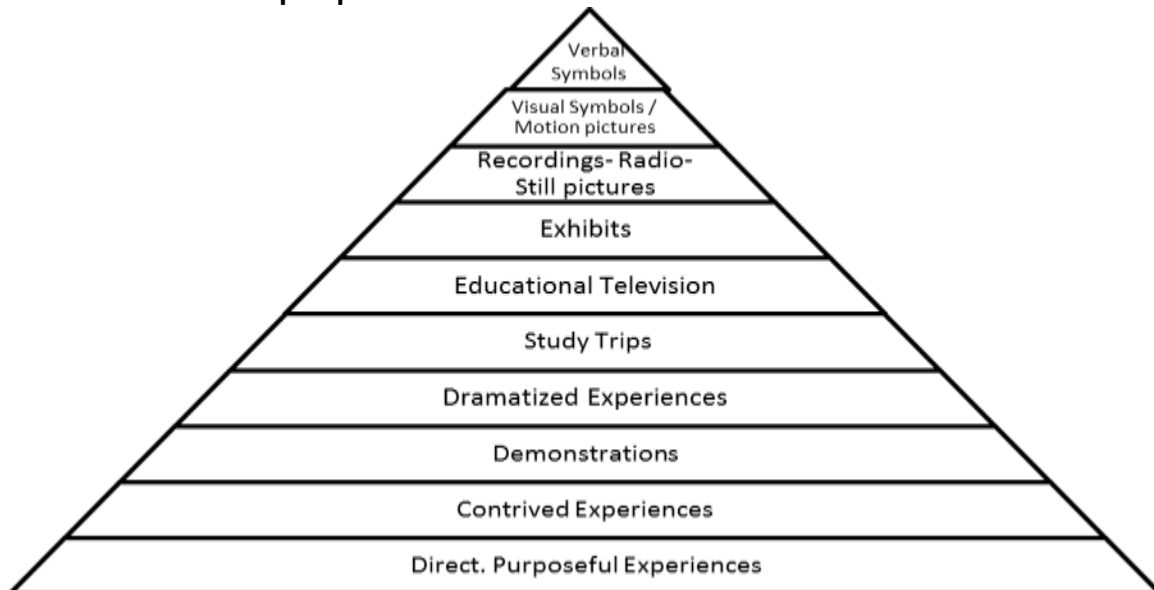
We made an average of the marks given by students in all specializations for each of the eleven teaching methods and thus we could see their opinion regarding the effectiveness of the methods in teaching and learning process, but at the same time, we could identify the individual "positions" of the methods in the learning process, in terms of the students' estimations.

Thus, according to marks provided by students in the socio-humanistic specializations, the University of Craiova, the methods have the following classification, depending on the efficiency they considered these have in the learning process:

Teaching method	Average mark
"Verbal Symbols"	2.93
"Visual Symbols"	3.66
"Recordings- Radio- Still Pictures"	3.72
"Motion Pictures"	3.66
"Educational Television"	6.68
"Exhibits"	4.63
"Study Trips"	7.09
"Demonstrations"	8.12
"Dramatized Experiences"	7.22
"Contrived Experiences"	8.47
"Direct. Purposeful Experiences"	9.84

According to the data resulted from the research, the order of the teaching methods is slightly modified from the cone version presented by Edgar Dale and two of the methods are on the same level (Visual symbols and Motion pictures). Thus, according to the data collected, the cone would have the following structure:

Figure no. 5. Dale's Cone of Experience
-from the perspective of the students interviewed in the research-



****Question number 2**

Estimate what is the average percentage of information retention (between 0 % and 100 %) for each of the following teaching methods:

Teaching Method	Percentage
"Lecture"	
"Reading"	
"Audio- Visual"	
"Demonstration"	
"Discussion Group"	
"Practice by doing"	
"Teaching others"	

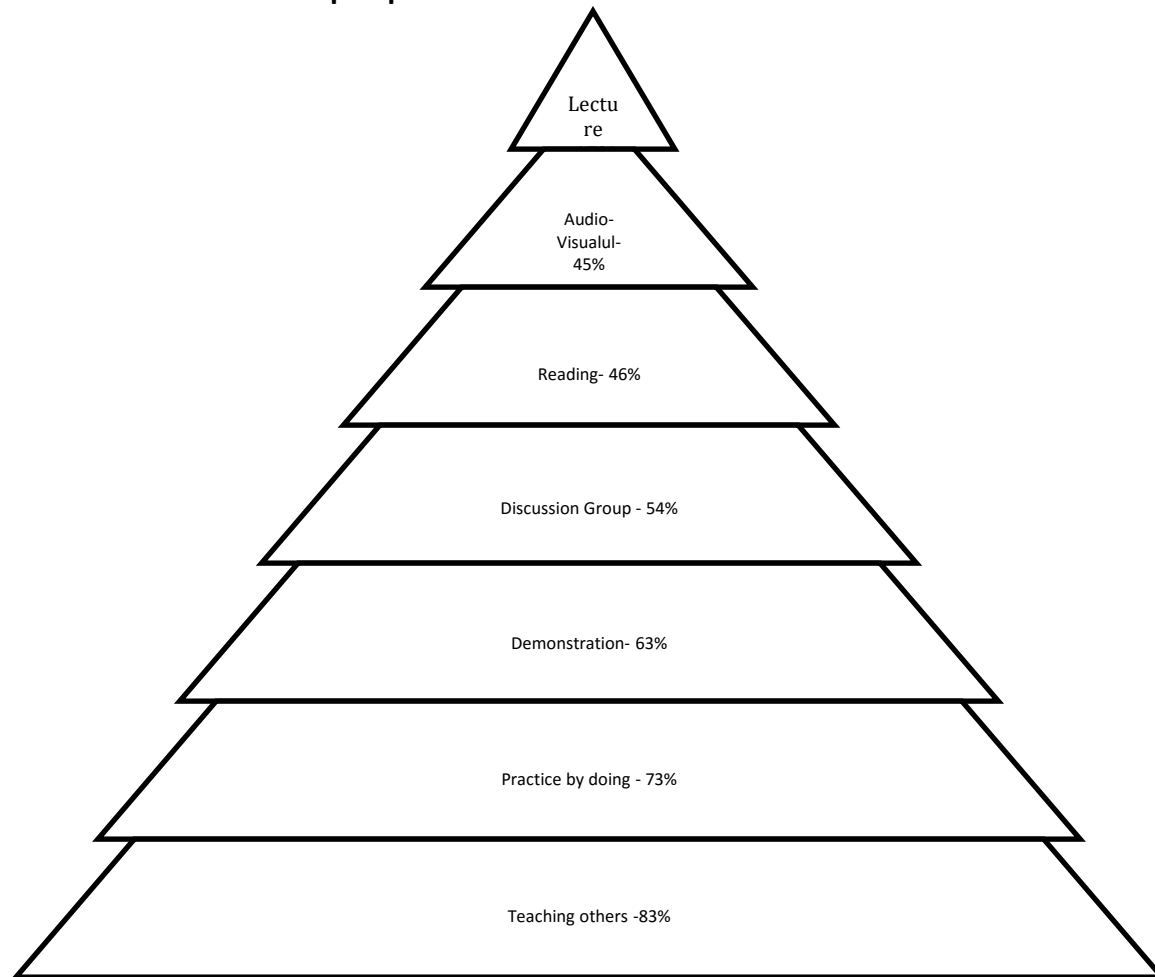
We made an average of the percentages given by students in all specializations for each of the seven teaching methods and thus we could see their opinion regarding the average percentage of information retention for each teaching method, but also we could identify the "positions" of the teaching methods in the learning pyramid, due to the students' estimations.

Thus, according to the percentages given by students in the socio-humanistic specializations, the University of Craiova, the methods have the following classification, based on the retention percentage:

Teaching method	Average percentage
"Lecture"	17.09%
"Reading"	46.19%
"Audio- Visual"	45.95%
"Demonstration"	63.33%
"Discussion Group"	54.52%
"Practice by doing"	73.33%
"Teaching others"	83.33%

Rearranging the learning pyramid according to the percentages stated by the interviewed students, this will have the following form:

Figure no. 6. Learning Pyramid
-from the perspective of the students interviewed in the research-



The Research Conclusions

We must mention that for both matrixes - type questions, the students' answers were very diverse, showing the fact that there are major differences of perception for each person regarding the effectiveness of the teaching method, but also the average percentage of information retention through the various methods. This confirms the fact that the two instruments *Dale's cone* and the *Learning pyramid* are flexible structures, representing at most orientated visual symbols that must be considered by didactic specialists.

All the four hypotheses, which we started from, were confirmed by the conducted research. Thus, the active - participatory methods are considered by students to be more effective than expository methods. It was also confirmed that the teaching methods proposed by Dale do not have a fix position in the Cone of experience created by him and according to the results of the research, a few position bands in the cone are slightly modified, proving at the same time Edgar Dale's statement, that the cone is not a mechanically flawless image, the bands being flexible divisions and they should not be *literally* translated.

Also it was proved that the proposed teaching methods do not have a fix position in the learning pyramid, the average retention percentages vary, as well as their position in the pyramid.

Conclusions

The dynamic evolution of current society is reflected globally in all social areas, which entails the careful reflection on effective classicism but also the adaptation of traditional processes and methods to the new social realities.

This is the case of the educational system in all its processes, which obviously suffered and suffer perpetual important developments with the application of new teaching and learning methods and techniques or the adaptation of the classic ones to the new specific realities.

Starting from Dale's Cone of experience and the Learning pyramid, there were analyzed all the methods and techniques of the educational - cognitive process and their temporal evolution, and by surveying the students in 3 specializations at the University of Craiova, who were interviewed about all the processes described in the two mentioned standards, there are presented and analyzed the actual and objective perceptions among the recipients of this complex and effective educational process.

According to the respondents selected a representative sample in the highest performance socio - humanistic specializations, but also with a critical realist spirit highly developed by the areas in which they study, at the University of Craiova, combining classical methods with modern ones is the most efficient model to use in the teaching and learning process.

The evidence with which respondents stressed on some methods presented both in Dale's Cone of experience as well as the Learning pyramid, is a major source of inspiration and one to follow by the teachers involved in this complex and evolving process.

Although the major emphasis was placed on the new practical didactic techniques as well as the audio - visual methods, group discussions etc., due because, most likely, also to the importance given by current society to these methods in most social areas, classical methods such as teaching, reading or demonstration also have a particular importance.

The conclusion after the research stresses the fact that it is imperatively necessary to combine the classical methods and techniques with the modern ones in order to achieve the most effective and notable ones in the education process.

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