

# OPTIMIZING THE FORMATION OF FUTURE SCIENCE TEACHERS FOR ACTIVATING THE STUDENTS DURING LESSONS

## OPTIMIZAREA FORMĂRII VIITORILOR PROFESORI DE ȘTIINȚE ÎN VEDEREA ACTIVIZĂRII ELEVILOR ÎN LECȚII

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**Abstract.** *In the modern school, an important role of the teacher consists in the organization of didactical activity in such way to determine the students to participate actively to their own formation, as subjects of learning. By organizing diversified learning situations with respect to the didactical methodology used, and differentiated in accordance with the different learning styles of the students, the teacher creates conditions needed for the activation of students within the lesson. Taking into consideration the importance of formation of future science teachers, in accordance with the exigencies of present education, we have carried out an empirical research, based on the questionnaire and interview methods. We consider that the formation of future science teachers for activating the students during lessons can be optimize by stimulating the practicant students' creativity, and by encouraging the cooperation among the practicant students who are using a diversified methodological register within the lesson and the other students.*

**Key words:** future science teachers, activating the students, lessons

**Rezumat.** *În școala modernă, un rol important ce-i revine profesorului constă în organizarea activității didactice în așa fel încât elevii să participe activ la propria formare, ca subiecți ai învățării. Prin organizarea unor situații de învățare diversificate în ceea ce privește metodologia didactică utilizată și diferențiate în funcție de diferențele stilurile de învățare ale elevilor, profesorul creează condițiile necesare activizării elevilor în cadrul lecției. Având în vedere importanța formării viitorilor profesori de Științe conform exigențelor învățământului actual, am realizat o cercetare empirică, bazată pe metoda chestionarului și interviului. Considerăm că formarea viitorilor profesori de Științe în vederea activizării elevilor în lecții poate fi optimizată prin stimularea creativității studenților practicanți și prin încurajarea cooperării dintre studenții practicanți care utilizează un registru metodologic diversificat în cadrul lecției și ceilalți studenți.*

**Cuvinte cheie:** viitori profesori de Științe, activizarea elevilor, lecții

### INTRODUCTION

The quality of didactic activity in the modern school is given by its capacity to multiply by itself the formative effects on the students and to avoid those situations in which the learning become a process of memorizing the answers given to some questions which are not of themselves (Albulescu I., 2008). Having in view that not any type of learning is efficient for the formation of students personality, at present, is

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considered that the role of teacher does not limit to the transmission of some “ready made” knowledges, which the students to receive passively, but consists in organizing the learning in such way that the students have to participate actively, by their own effort, to their acquiring (Petruța, G. P., 2008). Is considered that the student is active at lesson if make an effort of personal reflection, if undertake a mintal action of searching, investigating and rediscovering of truthes, of elaborating new knowledge (I. Cerghit, 2006). Thus, for the active student, the teaching-learning lesson becomes “an adventure of getting knowledge” (Oprea C. L., 2009).

Activation of students is an action of education and instruction, of developing of their personality by methodical stimulation and guidance of their activity. It refer to the stimulation of thinking, intelligence and other psychic functions of the students, as well as to the creation of a motivation for learning and action (Dicționar de pedagogie, 1979). Activation of students is a condition of school successful outcome, of obtaining maximum performances by the students, constantly accompanied by instructive-educative effects with positive role in developing all the components of their personality. This is carried aut by: a) stimulation and cultivation of the students interest for knowledge; b) valorization of the students intelligence and other psychic functions, by the effort that they made; c) formation and practicing of students ability to acquire knowledges; d) formation and practicing of students abilities to autonomously orientate in practical problems/situations; e) cultivation of investigative spirit, personal searches, and of the epystemic attitude, by training the students in organizing, conducting, carrying out and evaluating school and out of school didactic activities (Ionescu M., Radu I., 2004).

For coming up to these exigences of the modern education, is necessary that, within the pedagogical practice, the future teachers of Sciences organize the didactic activity in such way to stimulate the students to documentate themselves, to discover new knowledge, to investigate, to solve different problem-situations, to propose personal solutions, which they have to sustain with arguments, or to elaborate personal paperworks. In order to optimize the initial formation of the teachers of Sciences, we were aiming at evaluating the level of formation of practicant students in respect of determining the active participation of students within the lessons, during the pedagogical practice carried out by them in gymnasium. The objectives of this research were the following:

- establishing the modalities used by students for activating the school children during the lessons;
- establishing the level of school children activation within the lessons given by the students.

## **MATERIAL AND METHOD**

In order to know the mode in which the students from the Faculty of Sciences, within the University of Pitesti, have stimulated the active participation of school children within the lessons, an empirical research was carried out, based on the questionnaire and interview methods. The questionnaire, elaborated for the students, included questions concerning the modalities of activating the school children used by the students for verifying their knowledges, for arousing the interest for the lesson, for communicating new knowledges and

for their fixation and systematization. Also, it included a question concerning the personal contribution with respect to the application of some methods or creation of some learning tools aiming at the activation of school children. The structured interview was elaborated for the mentor teachers. It comprised questions concerning the school children categories solicited within the lessons and the level of their activation, during the two lessons given by the student sat gymnasium. Both the questionnaire and interview were applied within the colloquium of pedagogic practice, at the end of first semester.

The starting hypothesis was the following: the stimulation of students to use within the lessons a diversified and differentiated methodological register, helping to solicitate all the school children categories, as well as encouraging the students to create original didactic tools, contributes to the formation of the future teachers of Sciences according to the requirement of activating the school children at lessons.

The population sample included in our research was formed from 81 students in the third year of study, in the academic year 2010 – 2011, and five mentor teachers. From the questioned students, 11 were from the study program in Biology, 21 students from the study program in Ecology and environment protection, 10 students from the study program in Horticulture, 25 students from the study program in Environmental engineering, four students from the study program in Chemistry, four students from the study program in Physical engineering, and six students from the study program in Nursing, respectively.

## RESULTS AND DISCUSSIONS

By analysing the students answers we found that all the lessons given by them were lessons of communicating/acquiring new knowledges.

With respect to the forms of activity used during the probe lessons, it was found that 37.03% from the students have used exclusively the frontal activity. The same percentage (37.03%) of studens, combined the frontal activity with individual activity. A smaller percentage (18.51%) of students, combined the frontal activity with that carried out in groups. The students who combined during the lesson the frontal activity with that carried out in groups and individually, formed the smallest percentage (7.40%). Within the final lessons, 43.20% from the students combined the frontal activity with individual activity, 30.86% from the students combined the frontal activity with that carried out in groups, while 25.92% from the students combined the frontal activity with that carried out in groups and individually.

For the activation of school children at lessons, the students have used various didactic methods (table 1), enabling the stimulation of thinking, language, intelligence, memory, and the other psychic functions.

For stimulating different learning styles of school children, the students have used certain didactic methods, which were combined during the lesson. In order to stimulate the school children with a visual learning, the students have used observation, demonstration, model devices, work with the manual, didactic game, graphical organizer. For the school children with an auditory learning style, the students have used conversation, explanation, narration, problem solving, learning by discovery, and for the school children with a practical learning style, the students have used laboratory practical work, work with the manual, exercise, and the five minutes essay. In the case of probe lesson, the answers to the questions from the questionnaire and interview revealed that 71.60% from the students have

combined the models which stimulate the visual learning style with those which stimulate the auditory learning style.

Table 1

**The didactic methods used by the students within the lessons**

Lesson's stage	Didactic methods	Probe lesson Students (%)	Final lesson Students (%)
verifying the knowledges	conversation	65.43	37.03
	conversation and demonstration carried out by the school children	28.39	41.97
	didactic game "who knows the answer?"	6.17	14.81
	graphical organizer	0.00	6.17
sensitizing, awakening the school children interest	narration	3.70	1.23
	conversation	88.88	80.24
	problem solving	2.46	3.70
	didactic game (rebus)	4.93	14.81
communicating / acquiring new contents	observation, demonstration, explanation, conversation	40.74	22.22
	observation, conversation, learning by discovery, explanation	3.70	18.51
	observation, conversation, problem solving, explanation	2.46	4.93
	conversation, observation, model devices, explanation	24.69	14.81
	explanation, demonstration, conversation, work with the manual	23.45	27.16
	explanation, demonstration, conversation, laboratory practical work	4.93	12.34
fixation of knowledges	conversation	27.16	18.51
	conversation and demonstration carried out by the school children	12.34	16.04
	conversation and exercise	37.03	35.80
	conversation and narration	23.45	4.93
	didactic game (rebus)	1.23	13.58
	graphical organizer	0.00	6.17
	five minutes essay	0.00	4.93

A smaller percentage of students (28.39%), combined the methods which stimulate the visual learning style with those which stimulate the auditory and practical learning styles. The analysis of the answers of students referring to the final lesson revealed that the percentage of students who have combined methods which stimulates the visual learning style with those which stimulate the auditory learning style decreased to 60.49%. Concerning the percentage of students who have combined the methods which stimulates the visual learning style with those which stimulates the auditory and practical learning styles, an increase to 39.50% from the students was found.

Another aspect that we have in view by applying the questionnaire refers to elaboration by the students of some didactic tools, which are intended to solicitate

the participation of school children during the lesson. Within the probe lessons, 11.11% from the students elaborated working records for the school children individual activity, with the aim of verifying their knowledges, and 25.92% from the students, with the aim of evaluating their knowledges. A small percentage of students (9.87%) have elaborated working records for the school children activity within groups, aiming at the fixation and systematization of knowledges. A high percentage of students (55.55%) have presented images or curiosities extracted from the Internet sites. In order to apply the didactic game in different moments of the lesson, 6.17% from the students have elaborated a rebus. Within the final lessons, the percentage of students who have elaborated working records for the individual activity of the school children aiming at verifying their knowledges decreased to 4.93%, but this resulted in the increase to 38.27% of the percentage of students who have elaborated working records for the individual activity of school children aiming at verifying their knowledges. Some students (30.86%) have elaborated working records for the school children activity within groups, aiming at the fixation and systematization of knowledges. The percentage of students who have used in the final lessons images or curiosities found on the Internet sites maintained at a similar value (53.08%) with that mentioned for the probe lessons. A higher percentage of students (28.39%) have elaborated a rebus, and a small percentage (3.70%) have identified interdisciplinary conexions and realized a schedule of a graphical organizer, which was intended to be completed with help from the school children.

Following the discussions with the mentor teachers, there have been identified the categories of school children who were solicited during the lessons by the students (table 2).

Table 2

**Categories of school children who participated actively within the lessons given by the students**

Categories of school children	Probe lesson students (%)	Final lesson students (%)
Very well trained school children	6.17	0.00
Very well, and well trained school children	20.98	3.70
Very well, well, and poor trained school children	16.04	7.40
Very well, well, and very poor trained school children	9.87	20.98
Very well, well, poor, and very poor trained school children	46.91	67.90

Table 3

**Level of school children activation within the lessons**

Type of lesson	Activation of school children		
	to a small extent students (%)	to some extent students (%)	to a great extent students (%)
Probe lesson	6.17	46.91	46.91
Final lesson	0.00	32.09	67.90

Taking into consideration the categories of school children activated during lessons, the mentor teachers have pointed out the level of school children activation, realized by the students during the lessons given by them (table 3).

## CONCLUSIONS

1. The students have used in lessons the following modalities for activation of school children: a) they have combined different forms of activity with the school children; b) they have used various didactic methods, including active and interactive methods; they have combined the didactical methods, considering the necessity of activating the school children with different learning styles; c) they have used working records for the individual and within groups activity; d) they have created original didactic tools (rebus, graphical organizer) for gaining the interest of school children and for motivating them for learning.

2. Comparing the answers of students with those from the mentor teachers, can be identified the following types of students, with respect to their formation in order to activate the school children within the lessons: 1) students satisfactory trained – who have used properly the modalities of activation the school children during the lessons, but have solicited only a category of school children; 2) students well trained – who have used properly the modalities of activation the school children, engaging during the lessons more categories of school children; 3) students very well trained – who have used properly the modalities of activating the school children in lessons, stimulating the participation of all categories of school children.

3. For optimizing the initial formation of the future teachers of Sciences, with respect to the activation of school children at lessons, we consider that should be stimulated the creativity of practicum students and encouraged the cooperation between the students who are successful in soliciting the participation of all categories of school children, using a diversified and differentiated methodological register, and the other students.

## REFERENCES

1. **Albulescu I., 2008** – *Paradigma predării. Activitatea profesorului între rutină și creativitate*. Editura Paralela 45, Pitești;
2. **Cerghit I., 2006** - *Metode de învățământ*. Ed. Polirom. Iași
3. **Ionescu M., Radu, I., 2004** – *Didactica modernă*. Editura Dacia, Cluj-Napoca;
4. **Oprea C.L., 2009** – *Strategii didactice interactive*. E.D.P., București;
5. **Petruța G.-P., 2008** – *Metode interactive utilizate în cadrul orelor de Biologie*. In: "Strategii alternative de instruire, învățare și evaluare". Ed. Risoprint. Cluj-Napoca. p. 335-340;
6. **\*\*\*, 1979** - *Dicționar de pedagogie. al României*. E.D.P., București.