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Reflections on a School Teaching: An Exemplary Teaching about Primary Productivity & Energy Flow in Natural Ecosystems

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Abstract

The research has been carried out in the material that Biologist teacher have prepared for the students and teachers, focusing mostly on the sub-query of teacher's self-assessment, since teacher had written a self-assessment, a reflection, upon differentiation points from an ordinary teaching, with a structured way. This paper searches on the reflections on a school exemplary teaching of Biology about primary productivity & energy flow in natural ecosystems.

Graduated students of Lyceum were asked to answer a questionnaire on how they felt during the lesson and how they assessed themselves toward the teaching, in relation to the content taught, the methodology followed, their performance and the degree of involvement with a students' Evaluation Sheet.

In a self-assessment process, the teacher asked to reflect where this exemplary teaching is differentiated from the ordinary. A content analysis was held in the material that Biologist teacher had prepared to satisfy the demands of the exemplary teaching. This material was given to the students in the beginning of the teaching, consisted of a multipage printed document with the flow diagram, the worksheet, the parallel texts for home study and the self-evaluation sheet.

The statistical analysis of the replies of the Students' Evaluation Sheet revealed the feeling of pleasure experienced by students and success of teacher. All data, when analyzed carefully, enables teacher's self-assessment for further improvement.

Keywords: exemplary teaching, primary productivity, energy flow, frontal-hourly teaching

1. Introduction

Until 60s, society was looking for the good and comprehensive teacher who embodied an ideal figure of teacher with many qualities and virtues and with no or very few weaknesses and defects (Exarhopoulos, 1961). The job of the teacher becomes increasingly demanding since she/he works with more heterogeneous groups of students in relation to the past (heterogeneous in terms of mother tongue, sex, national origin, religion, abilities, etc.), she/he must use the possibilities offered by new technologies to respond to the request of personalized learning and to learn students how to learn independently for their whole lives and additionally, she/he more special administrative duties as a result of increased school autonomy (EC, 2007).

Research since then has made shift towards an effective teacher-thinker. It has identified characteristic behaviors of the teacher into the classroom, which can be measured by standardized tests and are considered essential to achieve the desired learning outcomes. These are clarity, variety, orientation to teaching task, encouraging students to engage, and teaching organization in a way that ensures success (Borich, 1988; Reid et al., 1988; Sprinthall & Sprinthall, 1990; Slavin, 1989). The concepts of "quality", "effectiveness", "efficiency", "quality control", "quality assurance", "criteria and evaluation indicators" are central to the educational ground from the 90s onwards. These concepts have their primarily origin in the Economy fields associated with the objective of increasing the efficiency of production units and their influence in the educational field which extend to formulate strategies and development methodologies of education systems (Doukas, 2007).

This paper is referred to the assessment of a school exemplary teaching with reflection of students and teacher on the subject of "Primary Productivity linked to the Energy Flow in natural ecosystems" in the chapter of Ecology, in the course of Biology of C class of Lyceum, a course of general education. The teaching designed as exemplary and addressed to students aged 17 to 18 years of the Archanes Lyceum, a Greek (Cretan) General High School, in the framework of the training activities of School Advisor for newly appointed Science Teachers in Heraklion, Crete prefecture (document No 39/15-2-2005, of the Administration of Secondary Education of Heraklion). For teaching Biology and other science courses in the third class of Lyceum it is necessary to develop special methodology and material to respond more effectively to the specific requirements of the courses as addressed to senior high school students (18 years), examined at national level with common themes given by the Central Examination Committee.

The issue of exemplary teaching chosen as of utmost importance crucial for life on the planet as per day on Earth reached 1022 Joules of solar energy arriving (= 1,000 Hiroshima atomic bombs) and only 1% (= 1020) is bound by producers for photosynthesis, producing 17.1010 tn organic matter (Lykakis, 1992). The Primary Productivity expresses the production rate of organic matter to the producers of an ecosystem, part of which is consumed by the consumers, and so the energy of the sun entering ecosystems and trapped by the plants, flows to herbivores and carnivores, keeping in balance. The variety of productivity in terrestrial and aquatic ecosystems of our planet is great, ranging from the most productive, as the Delta rivers in moderate, such as forests and to the unproductive and arid ecosystems such as deep lakes, open seas and deserts. Students in Education for the Sustainable Development need to know well and to realize the value of biodiversity of earthy ecosystems, to raise awareness and undertake initiatives and actions in the future as environmentally, scientifically literate adult citizens, to maintain the Nature inherited from their parents as a World Heritage down to their descendants (Bruntland Commission, 1987). In order Education for the Sustainable Development to be effective, it must be approached with the integration of its themes across the relevant fields, projects and courses so that teaching and learning significantly aided by the content, quality and availability of supervisory material (UNECE, 2005).

According to Matsagouras et al. (2014), there is a clear conceptual difference between "good", "qualitative" and "effective" teaching. Good teaching consists of three interrelated components of methodological, psychological and moral nature (see, Fenstermacher & Richardson, 2005; Bernliner, 1987, 2005, 2007; in Matsagouras et al., 2014), which ensure that both the content of teaching is important to be appropriate for the students' age and the followed didactic ways are valid with methodological, psychological and pedagogical principles.

In previous decades, research on the effective teachings had the criterion of efficiency to achieve high-level student performance, particularly as defined by the national standard of expected performance in specific learning test and Exams. The following research focused on how "good" was the teaching according to self-assessment and reflections of the students and teacher who experienced it.

2. Method

A qualitative and quantitative research was carried out in order to be answered the research question about those teacher experienced from the design of an exemplary teaching and students from the teaching implementation, referring to the sub-queries of how students made their self-evaluation (A) and teacher her self-assessment (B).

2.1 Students' Self-Evaluation/Reflection

As for the sub-query of Students Self-Evaluation/Reflection (A), students were asked to answer a questionnaire about how they felt during the lesson and how they assess themselves toward the teaching. Students' Self-Evaluation Sheet was a questionnaire, slightly modified of the Sheet of Periodical Student Assessment (YPEPTH-KEE, 1999) about how they felt during the lesson and how they assess themselves in relation to the content taught, the methodology followed, their performance and the degree of their involvement, course attendance difficulties and where they attributed, and finally, how satisfied they thought that teacher is of them. The questionnaire was eponymous. According to Article 4 of Presidential Decree 121/95, evaluation, as an individual assessment of the student's performance, is not an end in itself, and in no way assumes competitive or selective character for the students. It does not only refer to the students' performance of the various courses, but also to other characteristics, such as the developed effort, interest, initiatives etc.

The questions were 11 of closed type, with possibilities of more than one choice, and 3 open-ended. In these questions, the student were asked: 1) how she/he felt during the course (interest, boredom, satisfaction, anxiety, joy, frustration, superiority, inferiority), 2) if she/he easily understood the lesson, 3) if she/he considers it is an easy or difficult course, 4) what most made it difficult, 5) if she/he thinks that had deficiencies in prerequisite knowledge, 6) if she/he had inability to attend the lesson and where it is attributed, 7) if she/he made efforts to

meet the demands of the lesson, 8) how these weaknesses (if any) can be overcome, 9) if actively participated in the lesson, 10) if she/he expressed her/himself comfortably in oral speech, 11) if feels satisfied with the teaching, 12) what she/he would like to change in teaching, 13) how characterizes himself during the course (calm, attentive, cooperative, cultured, active, cheerful, impulsive, methodical, thoughtful, lazy, quiet, restrained, shy, talkative, intelligent), 14) whether she/he thinks teacher is satisfied with his performance.

Nineteen students, all of the class, completed the questionnaire during the last 5 minutes of the teaching hour and during the break. Statistical analysis of the replies aimed to reveal the "experienced successes" of the teaching implementation by the participants.

2.2 Teacher's Reflection/Self-Assessment

A content analysis was held in the material that Biologist teacher prepared to satisfy the demands of the exemplary teaching. This material was given to the students and teachers who attended the teaching guided with their school advisor, in the beginning of the teaching, consisted of a multipage printed document with the flow diagram, the worksheet, the parallel texts for home study and the self-assessment sheet. The flow diagram contained the subject, the cognitive objectives and activities which would take place. The research in this material focused mostly on the sub-query of teacher's reflection/self-assessment (B), since a portion of it was that teacher had prepared with a structured way, as written "self-assessment", a reflection, upon differentiation points from an ordinary teaching.

3. Results and Discussion

Evaluation is the systematic control process of the achieving degree of the desired objectives and specific targets of a teaching and generally of an educational activity (Presidential Decree 121/95, Article 4). The fields and the criteria of observation, evaluation, feedback of teachings, defined by the Ministry of Education for the external (by School Advisors) evaluation of teachers serving in the Pilot-Experimental Secondary Schools, was mentioned in two major categories (Circular of the Greek Ministry of Education D1/F.361.22/116672/01-10-2012, FEK2788/SB'/15-10-2012) preparation and conducting of teaching (i.e., teaching plan, clear objectives, compatible with curriculum, syllabus and the cognitive level of the students, teaching tools and strategies, cognitive adequacy of teacher, involvement/participation of students, teaching and learning environment, assessment students in all phases of teaching, internal consistency of teaching and management of teaching time etc.).

The studied teaching was not evaluated in so many fields, from so many points of view, as the teachings of Pilot-Experimental Schools, but approached through the prism of the gained experience, searching for those students and teacher took in their handfuls leaving the classroom at the end of the lesson. Two main types of evaluation were applied, the interim and final. The interim or formative was done during teaching with questions, exercises and discussion. The final assessment was done at the end of teaching to determine the degree of achievement of the objectives (cognitive, social, emotional and psychomotor). It aimed to directly modify of the current and/or subsequent teaching to better respond to the students' needs (Duke, 1990). The teacher, from the answers got from the posed and arising questions, was informed about the quality and quantity of knowledge acquired by the students, whether they enjoyed the lesson, assessing indirectly the teaching (YPEPTH-KEE, 1999). This data, when analyzed carefully, supported also teacher's self-assessment for further improvement.

3.1 Students Self-Evaluation/Reflection

In every teaching is need to be checked if the objectives have been achieved, at the end of the teaching. Teacher is required to know whether the objectives have been achieved for all students or whom, why were not achieved, so that he can give weight and demonstrate more attention next time in the design and planning of new teachings (PI, 2011). In the researched teaching, the checking of achievement the cognitive targets was done with the problem solving of issues that had been given, in previous years, at Pan-Hellenic Exams, contained in a Students' Worksheet. A small number of students could participate to the altogether effort to solve the three issues-problems at the final phase of teaching, the phase of students' evaluation.

Another used worksheet, the Students' Self-Evaluation Sheet was an eponymous questionnaire concerning the rest type of teaching's targets, where students were asked how they felt during the lesson and how they assess themselves in relation to the content taught, the followed methodology, their performance and the degree of involvement into the teaching (emotional, psycho-motor and social targets). Feedback from any educational activity, as teaching is, develops higher mental functions, cultivates meta-cognitive skills so it is good to seek as much as possible into teachings (PI, 2011).

Nineteen students, the total class, easily and very quickly, answered the 14 questions of the questionnaire (only 1 student didn't answered the 2nd and 4th question). 19 of them wrote their names-4 girls and 15 boys, the rest were anonymous. One student made paintings in the margins of the Self-Evaluation Sheet, an elephant saying that "I need one tree in one meal" and another student wrote "I love Biology". Most of them avoided to express opinions in the open ended questions, and answers of those who dared it, had only one or two words. May a questionnaire with exclusively open-ended questions, not mixed like this, could help them to express more analytically and in depth their thoughts and feelings about those experienced in teaching.

According to the Greek Presidential Decree 152 FEK 240/5-11-2013, a teacher of Primary & Secondary Education is evaluated "adequate" if he/she, among the others criteria, attempts and mobilizes sufficiently the student interest, with the emergence of queries and labeling misunderstandings on issues of the lesson content, and disclosures during the learning processes that will follow, if she/he activates previous knowledge by connecting to previous lessons and students' experience with the necessary repetitions. In the question of how students felt during the lesson (interest, boredom, satisfaction, anxiety, joy, frustration, superiority, inferiority), a question with more than one possibilities for answer, recorded the following choices: 15 interest, 3 satisfaction, 1 anxiety, 2 joy, 1 didn't answer. In the choice of writing something else only 2 students wrote "It was fun", "it was amazing".

In the "New School" Greek educational reforming of 2010, it was promoting the greater tailoring teaching to the needs of each student, as individualized teaching, with the use of learning activities for active participation instead of passive attending (PI, 2011). 10 students were "very much" and 9 students were "much satisfied" with the teaching, 7 of them wrote that they do not want anything to change in the teaching, 1 asked more humor, 2 considered that "everything was ok". When they were asked if they actively participated in the lesson, 8 declared medium, 7 very much, 3 much and only 1 minimum. In the question if they expressed comfortably in oral speech, 7 answered enough, 4 very much, 4 medium and 4 slightly.

Students were asked to characterize themselves during the lesson (calm, attentive, cooperative, cultured, active, cheerful, impulsive, methodical, thoughtful, lazy, quiet, restrained, shy, talkative, and intelligent), with more than one. The recorded characterizations were 12 declared attentive, 11 cheerful, 9 calm, 6 shy, 6 talkative, 5 cooperative, 4 active, 4 quiet, 2 thoughtful, 2 restrained, 1 impulsive. So the lesson could be characterized "successful" and the teacher "adequate" because they satisfied the relevant criteria of the above mentioned Greek Presidential Decree 152.

About the lesson difficulty, half portion of the students (9) characterized it easy, half (9) neither easy-nor difficult, 1 didn't answer. 17 students easily understood the lesson and 2 relatively easily. Most of the difficulties were found in "diagrams", "to seat so much time without speaking", that they "have to learn exactly what the book writes" and 4 of them found "nothing" as difficult, with 12 students not to complete this answer. In the question if students made efforts to meet the demands of the lesson, 8 students answered minimum, 5 medium, 4 enough, 2 very much. 7 students realized few deficiencies in the prerequisite knowledge, 2 many and 10 not at all. 16 students "hadn't any inability" to attend the lesson, 3 of them declared "positively" and attributed it to personal reasons (2 of them) and to personal inadequate effort (1 of them). The weaknesses can be overcome with "private lessons", "more reading" (2) and "comfortably". Only 4 suggestions were recorded by the students on how they could overcome the difficulties and inabilities that they met during the teaching. These results reveal students' perception about the existing difficulty of the lesson and their placement toward this. The teacher realized that "students were able to separate and simultaneously realize the lesson as a wholeness constituting by the subject, the teaching methodology, the teacher efficiency and their contribution to the lesson success".

Teacher with interest, enthusiasm, flexibility and pedagogic culture develops the teaching activities by giving space to the students for self-motivation and activation, offering increased inclusiveness to enjoy the learning adventure with minimal guidance. This type of didactic conditions promotes the learning process and confirms the quality of teachings (Matsagouras et al., 2014). In the last question, whether students believe that their teacher was satisfied with their performance, 10 students answered "enough", 2 "very much", 5 "medium", 2 "minimum", obviously receiving the teacher's goodwill and the sense of success she felt.

For the evaluation of teachers served in pilot-experimental schools, which took place in 2012 in Greece, School Advisor Kosyvas (2012) pointed out that "when student is evaluated, via student is evaluated the educational work, when teachers evaluated, via teachers is assessing the significance of the educational system. Students are evaluated on how well they have learned, how well the teacher has taught and ultimately what the quality of the educational work is".

3.2 Teacher Reflection/Self-Assessment

During their career, teachers make practice, as apprenticeship, in preparing and evaluating teachings, among others in selection and formulation of the teaching objectives, the targets' achievement, the selection and use of appropriate techniques, methods, materials and teaching equipment, the compliance with the time and the teaching plan. But self-training is not adequate for their personal development, that's why the Major Training Program for Primary and Secondary School Teachers designed and applied in pilot phase to support the "New School" reform in Greece during the last decade (PI, 2011). An extended teachers' training of 200 hours duration supported them with much theoretical and practical knowledge in teaching Science cognitive objects in teams.

The teacher's self-assessment of the studied teaching based mainly on the study of the archival material that were delivered in the beginning of the course to the students, a multipage printed document with the flow diagram (with the subject, the cognitive objectives and activities to be undertaken both inside and outside the classroom), the worksheet, the parallel texts for home study and the Students' Self-Evaluation Sheet. "The studied teaching has significant differences from the conventional teacher-centered teachings those teachers were applied 30 years ago when these teachers were students, and many are yet preparing".

It must be continuous the effort of teachers to refine the questions and issues they give students for engagement and negotiation. The quality of the questions and issues reflects the creativity of the teacher, which was gradually improved with theoretical awareness and proper practice (YPEPTH-KEE, 1999). During the teachings' evaluation in Pilot-Experimental Secondary Schools, in the analysis of teaching with discussion and a written reflection, teacher, with the assistance of School Advisor, had to make an analysis of teaching after designing and implementation, by taking into account the relevant criteria of observation, measurement, feedback, to point out strengths and weaknesses, to value the degree of personal responding to the demands of the teaching, interpreting the reasons of the possible deviation from the initial teaching plan, etc. (Circular of the Greek Ministry of Education D1/F.361.22/116672/01-10-2012, FEK2788/SB΄/15-10-2012).

In quotes are listed excerpts from teaching's archives written by the teacher who planned to have, after teaching, a structured discussion with herself, the newly appointed teachers, and school advisor who accompanied them to the status of observers-trainer-trainees. To serve this discussion, teacher delivered the above mentioned in a multipage printed document.

3.2.1 Designing a Targeted Teaching

In an effective teaching planning must be taken into account the aims and the content of the lesson, the students to whom the knowledge will be addressed, the didactic and pedagogical methods that will be applied and the organization of the media that will be used (Mager, 1962; Gagne & Briggs, 1979). Initially, are identified accurately and clearly the instructive goals and objectives, then planned the strategies and educational activities which will assist in meeting the objectives and targets, and finally are determined the evaluation criteria. The objectives of a teaching can be formulated according to the UNESCO four levels of targets, which are the knowing and understanding, exploring and identifying, communication and collaboration, connection with real life (PI, 2011). According to Ausubel (1968), teacher's task is to select the proper materials and arrange the courses so as to advance from the general to the individual, from the whole to the part, thus students gradually entering, with summary reports and use of specialized teaching aids, from all over to the part (Ausubel, 1968; Slavin, 1988). Students got the knowledge from the Chapter "Ecology" to the Thematic Unit "Energy Flow in Ecosystems" and finally to the Didactic Unit/Topic "Primary Productivity". This teaching was designed bearing in mind essentially only the cognitive objectives that had to be conquered when negotiating the issue of primary productivity in connection with the energy flow in natural ecosystems, even the objectives had been separately staged, in cognitive, social and psychomotor-emotional level.

More specifically, although not listed as an explicit objective in the archival material, the teaching much contributed to shooting down the alternative idea that the most productive ecosystems on the planet are the forests. *"The most productive ecosystems of our planet are delta of rivers, marshes, coral reefs, wet forests, alluvial plains, the intensively cultivated lands. Moderately productive ecosystems are coastal, shallow lakes, dry forests. Unproductive ecosystems are deep lakes, open seas and deserts".*

3.2.2 Structuring and Implementation of Teaching

A teaching is affair of its participants, the students and their teacher, who co-construct it, acting as actors with their director and orchestra with its maestro in a theatrical or musical play. Entities of teaching are teachers who have to differentiate their teaching according to various existing conditions, to choose the appropriate pedagogical and instructional resources and methods to achieve the targets set in correspondence with the didactic content

(Chatzidimou, 2010). However, a successful teacher is the well-educated and trained in the scientific, pedagogical and didactic level, who is able to prepare the appropriate teaching that is responded to the students' demands and the available infrastructure.

As for the researching teaching, "the preparation of such a course is extremely demanding and time consuming. Spent too much time in the photos' search and presentation's creation, process extremely time consuming if one takes into account that each teacher has daily many different teachings to prepare for the taught science courses (often Biology, Physics, Chemistry, Environmental Sciences) under the compulsory working horary of 21 to 16 hours per week". The time and effort often spent by teachers in preparing the teachings are not imposed by external factors but by their dedication to do the job properly and provide effective care to the learners (Hargreaves, 1990). This internally derived dedication, within a fuzzy delimited profession, appears to be based on the so-called professional work and dedication. It is based on the types of concepts and objectives that teachers associate with their profession, which they gained, during the long apprenticeship in all three levels of Education (Mavrogiorgos, 2005). "The design teachings, like to be exemplary, is a particularly laborious effort, but made only once for each didactic unit, the first time that teacher is asked to teach. In the coming years, the produced teaching material is reused unchanged or with minor adjustments. This repetitive use offers the possibility for further improvements and useful conclusions about the teaching".

The success of the studied teaching can be sought in structuring and implementation of all the didactic phases without derogation from the initial teaching plan. "It established the teaching context and orientation, notified the topic, were written and substantiated the objectives and defined the procedure with the teaching plan that delivered from the beginning to the students and the teachers who attended the teaching". The new knowledge introduced (introduced concepts and described, explained phenomena), became application of new knowledge (concepts checked if working in new environments, new knowledge reconstructed and realized), and finally the new knowledge generalized and evaluated. Generally, the teaching followed the procedure goal-intervention-evaluation.

The compliance with the time is considered necessary for the proper and efficient functioning of the classroom and the school unit in general (Stavridou, 2011). In the teaching did not predict test time on those taught in the previous lesson because the time of one teaching period (40 minutes) was judged not sufficient because of the need of deeper analysis and multifaceted approach of the chosen didactic subject. "It's good to participate in the science dialogue as many students as possible, answering questions spontaneously raised with the progress of the teaching or predesigned, to make comments and observations. This ensures their attention and maintains undiminished their interest in the teaching. Moreover, through questioning-answering is controlled the reading and understanding degree of previous modules".

The key task in teacher's reflection was to think thoroughly the clarity, adequacy and completeness of the teaching plan, with important element the agreement of teaching plan with the actual teaching. The teacher has to assess the degree of realization what had scheduled, without excluding the possibility of success of the teaching, even with some digression from the original programming. "By this teaching I hope to achieve more or less, depending on the circumstances, some of the social, psychomotor and aesthetic goals set". Fenstermacher and Richardson (2005, 2007 in Matsagouras et al., 2014), summarizing surveys of recent decades, emphasize that a good teaching does not have stability of the form and the content, but adjusts the methodological, psychological and ethical characteristics of the students, the socio-cultural context and educational resources in order to achieve learning and development.

3.2.3 Teaching Methodology

Teaching is a complex action that gathers the characteristics of science, art and technique (ICE Delor, 1996). As a technique, teaching uses the methodological shapes and strategies which have been well planned and organized, are characterized by flexibility and adaptability and always takes into account the students, the resources and the classroom environment (Charalampopoulos, 1987). The discussing teaching was a frontal teaching, a presentation made by the teacher with explanations on displayed slides. "The images selected from other sources than the textbook in order students to realize that there is not one and only way in science and learning. I chose some pictures from textbooks of European Lyceums (from Ireland, Italy, Germany), so as students to have an idea of what respectively learn their European peers. A photograph is taken from the textbook of the course "Principles of Environmental Sciences' of B class of Lyceum. One slide is from the suggested slides of the Greek Pedagogical Institute".

For the students' assessment were used issues from the National Exams of period 2000-2004 referred to the teaching unit. These issues have the advantage of satisfactory examine the acquired knowledge in a standardized

way, since previously they have been used in the Pan-Hellenic Exams. In addition, they stir the interest of students, solving them as a challenge, helping students to determine the level of the conquered knowledge, and by simulating the Exams that they will experience in a few months, eventually contributing to their self-awareness and self-orientation for a successful admission to universities.

For home study proposed to students parallel text titles from school books, that is not common to the ordinary teachings. Senior year students is customary to use books and tutorial notes ancillary to the textbook for a more comprehensive preparation for the National Exams. Thus, by suggesting parallel texts for home study, which, although increase the evening workload, enable students to discover, invent, and above all to learn how to learn from authoritative sources of information (Piaget, 1974).

New appointed teachers who attended the teaching had to discuss about how the positive characteristics can be incorporated in other teaching and diffuse the results, as satisfaction factor and recommendation factor, according to Wong and Yeung (2003) interesting findings are low correlated. Intuitively they might had expected a high correlation between the satisfaction and recommendation factors, as one would expect a course participant to recommend a course to others if he or she is satisfied with it. This implies an even more difficult job for providers of self-funded training programs. Course providers most likely cannot rely too much on the degree of satisfaction of course participants merely in aspects of achievement of program objectives, usefulness of the programs to professional needs, appropriateness of duration, instructors' preparation of information, interaction between instructors and program participants, and usefulness of learning materials used or provided, for the planning and provision of new training courses.

3.2.4 Teaching Equipment

The selection and use of appropriate materials and teaching tools, regardless of their categorization (direct-indirect, traditional-modern, personal-impersonal, etc.), is much important, depending not only on the pedagogical and didactic teachers' skill, but also must be taken into account and exploited the existing infrastructure of the school, the intellectual and social level of the students, the goals set etc. Teaching aids codify and simplify the information, contribute to better organization of the curriculum with time saving, leading to more certain learning outcomes because of their multifunctional nature (Valakas, 1999; PI, 2011).

The teaching was prepared in environment of Windows 98 with Office package 2000 with no YouTube videos. Only texts, diagrams and photos contained in the Power Point presentation. The lesson was held in the school Science Laboratory. Important supervisory school material was exploited, not specialized, which was actually recorded from the beginning by the creator of teaching. "Were used teaching aids such as overhead projector, which was the teaching main tool, equipment of the school science laboratory but not of the classrooms where Biology was usually taught. Apart from the overhead projector as described above, in the preparation of teaching were used photocopying, transparency sheets, glass-board with special marker pens, PC, with desk software, scanner, printer and Internet". This infrastructure, 10 years before, was not so common and cheap like it is in nowadays, that's why this teaching was characterized as exemplary. "The school library was significantly exploited for books, educational videos and packages which were announced to students as available for lending".

The biggest part of the most specialized hardware, software and technical infrastructure that were required in the teaching preparation belonged to the office and archive of teacher, such as digital infrastructure, academic and various textbooks and the Biology's textbooks from European countries. "The preparation of such a teaching and field activity give opportunities for cooperation with teachers of the same and other specialties, to open the classroom's walls and the school boundaries. Promotes practice in computers and specialized software, use of video, camera, photocopier, etc. Introduces the concepts and basic principles of scientific research in Natural Sciences that are the experimental procedure, the statistical processing of measurements and the discussion of results with the use of specialized literature".

4. Conclusions

In the researched teaching, the teacher applied evaluation to check the achievement of cognitive targets by the use of problem solving method. In order to assess the degree of achievement of the emotional, psychomotor and social targets, she gave a Self-Evaluation Sheet asking students how they felt during the lesson, they if were satisfied with the teaching, how they characterized themselves during the lesson and how they assessed themselves in relation to the content taught, the followed methodology, their performance and the degree of involvement. In this Sheet, students expressed their aspects on the lesson difficulty, the efforts they made to meet the demands of the lesson, whether they think that teacher is satisfied with their personal performance. As

resulted, students were able to separate and simultaneously to realize the lesson as a wholeness constituting by the subject, the teaching methodology, the teacher efficiency and their contribution to the lesson success.

This teaching was designed bearing in mind essentially only the cognitive objectives that had to be conquered when negotiating the issue of primary productivity in connection with the energy flow in natural ecosystems, even the objectives had been separately staged, in cognitive, social and psychomotor-emotional level. The key task in teacher's reflection was to think thoroughly the clarity, adequacy and completeness of the teaching plan, with important element the agreement of teaching plan with the actual teaching. The success of the studied teaching can be sought in structuring and implementation of all the didactic phases, without derogations from the initial teaching plan, in compliance with the time.

Concluding, it seems that teaching had covered many targets, such as cognitive, social-emotional and psychomotor, also activities support the development of the cognitive domain of the students, the social environment and the involvement of the technological sector. That's why students expressed interest and satisfaction in participating, they hadn't many difficulties to attend it so they don't think that it needs improvements. It seems that they spend an hour pleasantly and efficiently negotiating with Ecology, energy flow, trophic chains and levels, primary productivity in natural ecosystems.

The time and effort often spent to the preparation of quality teachings are much and based on the types of concepts and objectives that teachers associate with their profession. Year after year, teachers' job is becoming increasingly challenging as working with more heterogeneous groups of students, they have to exploit the possibilities offered by new technologies, to meet the personalized learning request and teach to students how to learn independently throughout their lives (EC, 2007). For this, reflection, evaluation and assessment of the adopted educational practices and methodologies can provide valuable feedback to school to build upon its achievements and meet changing needs.

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