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UNIVERSITY JOSIP JURAJ STROSMAYER IN OSIJEK
FACULTY OF PHILOSOPY OSIJEK

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CONTEMPORARY TEACHING
SUVREMENA NASTAVA

Collection of scientific papers
Zbornik znanstvenih radova

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PhD ANĐELKA PEKO

Osijek, 2005.

PREFACE

At the beginning of the new century, education of students faces an ambitious task, namely to realize the vision in which an individuals and institutions, all around the world, appreciate learning, not only as means of accomplishing an aim, but as an aim itself.

To pursue the realization of that aim, Department for Educational and Psychological Training at Faculty of Arts in Osijek, has organized an international scientific seminar Modern teaching.

Teaching is the central topic of the seminar, with emphasis on communication in teaching process, different approaches to the lesson plans, lesson realization and lesson evaluation. All aspects of educational system have been taken into consideration: pre-school education, primary school, secondary school and undergraduate university education.

Partly, the works presented here have been directed towards theoretical analysis, and partly towards empirical approach.

Collected papers give a survey on a nine-year primary school system in The Republic of Slovenia, as well as a comment on the changes that were brought along by the new educational system in Slovenia.

This Collection of papers (further in the text–Collection) also deals with the issues of students' satisfaction with their studies and students' study interests.

There is also a mention of the influence of constructivism, a scientific approach in pedagogy, on education of pre-school teachers.

Communication in teaching process has been examined, as well as the realistic situation in primary schools. Modern education requires students' active participation in the educational process, and Collection attempts to present the realistic situation in our schools.

Theory and practice in teachers' education have also been presented here. Collection points to the necessity of a practical training in the education of future teachers and to the importance of keeping the pace with modern trends in their education.

Modern teaching includes all factors of education; therefore Collection examines the importance of cooperation between parents and teachers. What is also stressed here is the irreplaceable role of teachers and parents in the upbringing process.

Children's rights are foundation of modern teaching, and they have become one of the everyday-school problems.

One of the tasks of the modern education is to develop intercultural awareness, tolerance and prevention of discrimination, stereotypes and prejudices.

Modern teaching brings along different changes and challenges, and Collection demonstrates how it influences children's value system.
Another important issue mentioned in Collection is the necessity of setting precise evaluation standards for all aspects of educational activities.

Teaching mathematics, as well as other natural sciences, particularly requires the modernization of education of its teachers and introduction of the new teaching technologies.

Art education is still an important part of education. The influence of gender in development of artistic skills has been also presented here.
Scientific works are chosen with all the necessary reviewer's suggestions and corrections, and are categorized and published as scientific works. Professional works were published in the magazine *Život i škola* (*Life and School*), no. 11 and 12.

Department for Educational and Psychological Training at Faculty of Arts in Osijek would like to thank to all the participants of the First International Scientific Seminar.

We are especially thankful to the sponsors of the First International Scientific Seminar – University of J.J. Strossmayer in Osijek, Ministry of science, education and sports of the Republic of Croatia, reviewers, lector, publisher and all the others who helped publishing Collection.

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PREDGOVOR

Na početku novoga stoljeća pred obrazovanje je postavljena ambiciozna zadaća – ostvariti viziju u kojoj pojedinci i institucije posvuda u svijetu cijene učenje, ne samo kao sredstvo za postizanje cilja, nego i kao cilj. U želji za sudjelovanjem u ostvarivanju toga cilja, Katedra za pedagoško-psihološku izobrazbu Filozofskoga fakulteta u Osijeku organizirala je međunarodni znanstveni kolokvij *Suvremena nastava*.

U središtu je pozornosti kolokvija nastava, s posebnim osvrtom na nastavnu komunikaciju, različite pristupe njezinu planiranju, provođenju i vrednovanju. Obuhvaćeni su svi dijelovi obrazovnoga sustava: predškolski odgoj, osnovna škola, srednja škola te sveučilišno dodiplomsko obrazovanje. Radovi su dijelom usmjereni na teorijsku analizu, a dijelom na empirijski pristup.

U zborniku se daje pregled devetogodišnje osnovne škole u Republici Sloveniji te osvrt na promjene koje je novi obrazovni sustav donio školovanju slovenskih osnovnoškolaca. Prikazano je zadovoljstvo studenata pojedinih sveučilišta studijem te su istraženi interesi studenata tijekom studija. Dan je i osvrt o važnosti konstruktivizma kao znanstvenoga pravca u pedagogiji, o obrazovanju predškolskih odgajatelja. Propitivana je nastavna komunikacija te stvarna situacija u osnovnim školama. Suvremena nastava zahtijeva od učenika aktivno sudjelovanje u nastavnom procesu. No je li to tako u našim osnovnim školama, prikazano je u zborniku.

Dana je i usporedba teorije i prakse u obrazovanju učitelja. U zborniku se ukazuje na važnost praktične nastave u obrazovanju budućih učitelja te važnost praćenja suvremenih trendova u njihovoj izobrazbi. Suvremena nastava uključuje sve čimbenike obrazovanja, pa se u zborniku propituje važnost suradnje roditelja i škole. Ukazano je na važnu ulogu roditelja i učitelja u odgoju djece. Prava djeteta nezaobilazan su temelj suvremene nastave i svakako su postala jedan od svakodnevnih školskih problema. Zadaća suvremenoga obrazovanja jest i razvoj interkulturalne osjetljivosti, snošljivosti i otklanjanje rasizma, stereotipa i predrasuda. Suvremena nastava donosi razne promjene i izazove, a u zborniku je prikazano kako ona utječe na vrijednosni sustav učenika. Nužno je postaviti jasne standarde za sve dijelove odgojno-obrazovnih aktivnosti.

Nastava matematike kao i prirodne skupine nastavnih predmeta posebno zahtijeva osuvremenjivanje u obrazovanju nastavnika te uvođenju novih nastavnih tehnologija. Umjetnost je također važan dio obrazovanja. Stoga je prikazan utjecaj spola na razvoj umjetničkih vještina.

U zbornik uvršteni radovi pretrpjeli su odgovarajuće sugestije i korekcije recenzenata. Kategorizirani su i objavljeni kao znanstveni radovi. Stručni radovi objavljeni su u časopisu *Život i škola*, br.11 i 12.

Katedra za pedagoško-psihološku izobrazbu Filozofskoga fakulteta u Osijeku zahvaljuje svim sudionicima prvog međunarodnog znanstvenog kolokvija. Posebno zahvaljujemo pokrovitelju, Sveučilištu Josipa Jurja Strossmayera u Osijeku, Ministarstvu znanosti, prosvjete i športa Republike Hrvatske, recenzentima, lektoru, izdavaču, sponzorima i svima koji su pomogli objavljivanje zbornika.

Uredništvo:
Anđelka Peko
Edita Borić
Marija Sablić

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Milena Ivanuš Grmek
University of Maribor
Faculty of Education

TEACHING IN A NINE-YEAR PRIMARY SCHOOL IN THE REPUBLIC OF SLOVENIA

The paper illustrates some results of an evaluation study concerning the renovation of implementing the process of training and education in compulsory school.
In our research, we wanted to determine if the new curricula, which are implemented in the primary school for a trial period, influence the execution of the educational process, especially the methodological aspect.

1 Introduction

Until 1999, the school year in The Republic of Slovenia lasted eight years. An experimental implementation began in the 1999/2000 school year, introducing a nine-year primary school system together with the required process of evaluation.

The basis for the systematic reform of compulsory education was *The White Paper on Education in the Republic of Slovenia* (1995); the legal establishment was acquired by the *Elementary School Act* in 1996.

The main purposes of the school renewal are:
- changing the duration of compulsory education from eight to nine years;
- changing the organization of the schooling from two periods (1 - 4 and 5 – 8 years of schooling) to three triads (1 – 3, 4 – 6, 7 – 9 years of schooling);
- changing the entering of children to the school from age 7 to age 6;
- renovation of the curriculum.

The introduction and the supervision of the nine-year compulsory education is, methodologically, a demanding task. We investigate the intertwining of both the school and the curricular reform and their evaluation. In the area of school reform we are interested in the efficiency of the introduction of the new system; in the evaluation of the curricular reform we research the influence of curricular innovations on the educational reality.

The new primary school curricula directs the teachers to the use of different teaching methods, various interactions, teaching aids, and cross-curricular links. The teachers who plan the educational process are aware of the fact that this process is more varied and more effective if it combines a variety of approaches, interactions, and methods (Meyer 1996). Likewise, the presentation of the teaching of the learning content in different possible combinations creates a wider referential frame for the learners, a sense of coherence, and development of the learning content, the changing nature of knowledge, and its characteristic perspectives (Plut-Pregelj 2000, 148).

2 Definition of the research problem

The study of lesson planning in the eight and nine-year primary school represents the basic starting point of our research. We were interested in discovering whether the new curricula, which was implemented in the nine-year primary school, have any influence on the educational process, particularly from the didactically

methodological point of view (c.f. *Izhodišča za evalvacijo 1999*). Another element that we were interested in was to find out whether there are any differences in planning and the execution of lessons among the teachers who teach in the eight-year primary school using the old curriculum and the teachers in the nine-year primary school who implement the new curriculum.

Our hypothesis was that the teachers who teach in the nine-year primary school plan their lessons more often as a process and are less likely oriented towards the transmission concept of the educational work than the teachers who teach in the eight-year primary school.

3 Methodology

3.1 Basic research method

In our study a descriptive method was used.

3.2 Defining the sample and the procedure of collecting and processing data

The sample included the teachers who teach in the eight-year primary school and the teachers who teach in the nine-year primary school. Then we divided the sample into two groups.

Group 1 consisted of the teachers from all 42 primary schools which introduced the implementation of the new curriculum in the school year 1999/2000. This group, therefore, included:

- all teachers teaching in the second grade of the nine-year primary school in the year 2000/2001 in case the school started introducing the first triad,
- the teachers of the Slovene language, or mother tongue, mathematics, foreign language, history, biology and physics who taught in the eighth grade of the nine-year primary school in the year 2000/2001 in case the school introduces the third triad,
- all teachers who teach in the second grade and all of the above mentioned teachers who teach in the eighth grade in case the school introduces the first and the third triad.

Group 2 consisted of the teachers from 42 randomly chosen eight-year primary schools which have not yet started implementing the new curriculum for the nine-year schools (the old curriculum is still used in these schools). This group included:

- all teachers who taught in the first grade of the eight-year primary school in the school year 2000/2001
- the teachers of the Slovene language, or mother tongue, mathematics, foreign language, history, biology and physics who taught in the seventh grade of the eight-year primary school in the year 2000/2001.

The data were collected on the basis of an anonymous questionnaire.

Sixty-four of eighty-four primary schools returned the questionnaires completed by 247 teachers who teach in the eight-year primary school and by 182 teachers who teach in the nine-year primary school. All together we received 429 completed questionnaires.

We processed the data statistically at the level of the basic descriptive statistic processing along with the chi-square (χ^2) test.

In the presentation results, we restricted ourselves to the display of the frequency of use of the teaching methods, classroom interactions, and aids (teaching materials and equipment).

4 Results and Interpretation

We asked the teachers who took part in the survey to assess the frequency of use of the following teaching methods: explanation, discussion, display or demonstration, working with a text, problem-solving, and laboratory-experimental methods. We then compared the answers of the teachers from the eight-year primary schools with the answers of those teachers who teach in the nine-year primary schools.

Table 1: The frequency of teaching methods used in eight and nine-year primary school, chi-square (χ^2) test

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Methods	Results	Results
Explanation	$\chi^2 = 32,841$	P=0,000, the difference is stat.important
Discussion	$\chi^2 = 13,129$	P=0,157, the difference is not stat. important
Display	$\chi^2 = 16,432$	P=0,058, the difference is not stat. important
Demonstration	$\chi^2 = 8,440$	P=0,490, the difference is not stat. important
Working with a text	$\chi^2 = 20,404$	P=0,016, the difference is stat. important
Problem-solving	$\chi^2 = 13,942$	P=0,124, the difference is not stat. important
Lab-experimental method	$\chi^2 = 41,977$	P=0,000, the difference is stat. important

The results from table 1 call our attention to the following points:

- Teachers, teaching in an eight-year primary school a little bit more frequently (80,6%) use at giving lessons the method of explanation than teachers, teaching in a nine-year primary school (56,6%). The difference is statistically important.
- Teachers, teaching in an eight-year primary school and teachers, teaching in a nine-year primary school frequently use at giving lessons the method of discussion. In this case the difference is not statistically important.
- The method of display is being frequently used by the teachers, who used the old curriculum (eight-year primary school) and by the teachers who introduced the first triad of nine year primary school. However, this method is rarely being used by the teachers who introduced the third triad. The difference is not statistically important (P=0,058), but there exists a tendency of differences among the school types.

- Teachers, teaching in an eight-year and in a nine-year primary school relatively frequently uses the method of demonstration at giving lessons. In this case the difference is not statistically important.
- The method of working with texts is being relatively frequently used by the teachers, who introduced the third triad of a nine-year and eight-year primary school. However, this method is more rarely being used by the teachers, who introduced the first triad of a nine-year primary school. The difference is statistically important.
- The problem-solving method is being a little bit more frequently used by the teachers, teaching in a nine-year primary school (72,5%) than by the teachers, teaching in an eight-year primary school (59,9%), nevertheless the difference, that has been stated, is not statistically important.
- The lab-experimental methods are being used by the teachers, who were collaborating in the research, but on average they have been rarely used. Nevertheless, they are being a little bit more frequently used by those teachers, who are giving lessons in a nine-year primary school (33,0%), than by the teachers, giving lessons in an eight-year primary school (18,2%). The difference that has been stated is statistically important.

One of the elements that have an important role in the execution of the educational process is the teacher's decision about the organization of the lesson. The roles of the teacher and the roles of the learners are significantly different in direct forms like frontal teaching (teacher at front of the class) or lock-step and indirect forms like individual work, pair work or group work.

Table 2: The frequency of classroom interaction used in eight and nine-year primary school, chi-square (χ^2) test.

Classroom interaction	Results	Results
Frontal teaching	$\chi^2 = 73,529$	P=0,000, the difference is stat. important
Individual work	$\chi^2 = 14,083$	P=0,119, the difference is not stat. important
Group work	$\chi^2 = 66,941$	P=0,000, the difference is stat. important
Pair work	$\chi^2 = 34,652$	P=0,000, the difference is stat. important

The results from table 2 call our attention to the following points:
- Frontal teaching is used slightly more frequently by the teachers who carry out the curriculum for an eight-year primary school and by the teachers who introduced the third triad of a nine-year primary school. The same decision, but less frequently, is also being made by the teachers who introduce the first, as well as the first and third triad. The difference is statistically important.
- At their work teachers also use an individual work. The difference among the teachers, giving lessons in an eight-year primary school and the teacher, giving lesson in a nine-year primary school is not statistically important in this case.

- A decision to choose the usage of group work is being made a little bit more frequently by the teachers teaching in a nine-year primary school, than by the teachers teaching in an eight-year primary school. The difference is statistically important.
- There is a difference regarding the frequency of using pair work among the individual school types: it is, namely, being more frequently used in schools with the first and third triads than in an eight-year primary school, as well as in those introducing just one of the triads, especially the first one. The difference is statistically important.

A variety of aids (materials, equipment) are used by teachers in their lessons such as, various textbooks, newspapers, magazines, and activities from workbooks. The computer, internet, television, and radio are also used.

Table 3: The frequency of aids (teaching materials and equipment) used in eight and nine-year primary school, chi-square (χ^2) test.

Aids (teaching materials and equipment)	Results	Results
Different texts from the schoolbooks	$\chi^2 = 45{,}010$	P=0,000, the difference is stat. important
Activities from workbook	$\chi^2 = 15{,}086$	P=0,089, the difference is not stat. important
Different texts from newspapers, magazines...	$\chi^2 = 7{,}608$	P=0,574, the difference is not stat. important
Computer	$\chi^2 = 33{,}830$	P=0,000, the difference is stat. important
Internet	$\chi^2 = 43{,}331$	P=0,000, the difference is stat. important
Television	$\chi^2 = 14{,}027$	P=0,090, the difference is not stat. important
Radio	$\chi^2 = 31{,}051$	P=0,002, the difference is stat. important

The results from table 3 call our attention to the following points:

- Teachers from different school types frequently use various texts from the schoolbooks during lessons; however, those texts are being a little bit more rarely used by the teachers of those primary schools who introduced the first triad of a nine-year primary school. In this case the difference is statistically important.
- During the lessons teachers frequently use exercises and tasks from workbooks, whereas they are being a little bit more rarely used by the teachers, who introduced the third triad. The difference is not statistically important (P=0,089), nevertheless, there exists tendency of differences among the school types.
- During the lessons teachers use various texts from newspapers, magazines and books; they are, namely, being a little bit more frequently used by the teachers who introduced the third triad. In this case the difference is not statistically important.
- Teachers teaching in an eight-year and in a nine-year primary school rarely use a computer in their lessons, however, it is being more frequently used by the teachers

teaching in a nine-year primary school. The difference is statistically important. The reason for little bit more frequent usage of the computer in a nine-year primary school is probably in using better equipment in schools with computers.

- The internet is rarely being used by teachers in their lessons, if not at all, or it has not been available. However, there exists a statistically important difference concerning the school type; in school with the third triad the usage of internet is little bit more frequent than in other school types.
- Teachers rarely use television at giving lessons; it is being a little bit more frequently used by the teachers of those primary schools, who introduced the third triad. The difference is not statistically important (P=0,090), nevertheless, there exists tendency of differences among the school types.
- The teachers, who were including into the research, were of the opinion that they use radio at giving lesson; however, it is being a little more frequently used by the teachers of those primary schools who introduced the first triad of a nine-year primary school. In this case the difference is statistically important.

5 Conclusion

Teachers in an eight-year and in a nine year primary school use various methods and models, as well as didactic aids at giving lessons. The results of the research call our attention to the fact, that in nine-year primary schools a little bit more emphasis has been given to experimental (the usage of lab-experimental methods) and co-operative (group work, pair work) learning, as well as on including various media (computer, internet) into the teaching process.

Noting the results, I got the impression that planning of the lesson in nine-year school slowly transform from the transmission model to the process-oriented concept of education.

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NASTAVA U DEVETOGODIŠNJOJ OSNOVNOJ ŠKOLI U REPUBLICI SLOVENIJI

Članak donosi neke rezultate evaluacijske studije obnavljanja implementacije nastavnog i obrazovnog procesa u osnovnoj školi. Ovim smo istraživanjem željeli utvrditi utječu li novi kurikulumi implementirani u osnovnoj školi na pokusni period, na izvedbu obrazovnoga procesa, pogotovo na njegov metodološki aspekt.

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Marko Palekčić
University in Zagreb
Faculty of Philosophy in Zagreb

Izabela Sorić
University in Zadar
Faculty of Philosophy in Zadar

STUDENTS' STUDY INTERESTS AND SATISFACTION WITH STUDY

This study shows the results of an empirical research of the students' (dis)satisfaction with the organization and contents of their studies, and their study interests. The 411 research subjects have been chosen from among students from different study groups of the Faculty of Philosophy in Zadar. Most students express a great interest in their studies and a satisfaction with the study contents, but also dissatisfaction with the organization of their studies. Their study interest positively relates to their satisfaction with the contents, and negatively to their dissatisfaction with the organization of their studies. The students who have enrolled in the desired studies show a greater interest in them. They are also more satisfied with the contents of study and more critical of the organization of their studies. In other words, they are more dissatisfied with the organization of their studies than the students who were forced to enroll in substitute studies, having failed to enroll in the desired studies. The students who would re-enroll in the current studies, if given a chance, also show a greater interest in and satisfaction with the students' contents than the students who would change their current studies if given the chance (i.e. they would not enroll in the same studies again). Male and female students manifest the same interest in their studies and satisfaction with the contents. However, female students are more dissatisfied with the organization of their studies than the male students. The results obtained by this research are comparable to the results of the research conducted by other researchers who start from the same theoretic position (the so-called *The "Munich theory of interests"*) and apply the same or similar instruments for research. These research results are to be studied in the context of the pedagogical and psychological theory of interests and intrinsic motivation, but with the aim of improving the quality of university teaching.

1 Inevitability of coherent theoretic foundations for empirical research of the outcome of university teaching, i. e. university teaching quality

Dispersion and partiality are evident features of any empirical research of university teaching. It is therefore impossible to integrate results obtained in such research and form a basis for the stimulation of interest in university teaching (see Krapp, 1998). The research on the outcomes of university teaching has not been carried out for cognitive purposes, but for more practical/pragmatic reasons (e.g. usefulness and utility). The same trend is to be found in the research of teaching effectiveness or efficiency carried out in the USA, or in the evaluation studies of university teaching (i.e. of the studies) carried out in Germany. This is partly due to the lack of any theoretical foundations that are necessary for any empirical research. They should include the conditions and products (outcomes) of university teaching, and the quality of the teaching process as well. The quality of university teaching and learning should become the subject of systematic pedagogical and psychological research. It is therefore most important to develop theoretical concepts of an integrated approach to the teaching and learning phenomena on the academic level from a pedagogical and psychological perspective. This will help to improve the different methodological approaches (which

have been inefficient so far) and will lead to a more integrated study of the interdependence of goals, processes and outcomes of university teaching; in other words, towards a new scientific discipline - the didactics of university teaching. The lack of didactics in our higher education system (which is based on empirical research elsewhere in the world) is also due to the fact that the representatives of pedagogy and pedagogical psychology in our country scientifically study «practice» in various fields of human work and activity, but less in the teaching practice of scientific disciplines at university, and least of all, their own teaching practice.

The criteria that determine the quality of studies, i. e. the quality of university teaching, rarely include the type and quality of students' motivation for learning and study interest. However, some authors stress that students' motivation is a crucial issue regarding the quality of university teaching in the 21st century (see Prenzl, 1994; Hiddi/Harackiewicz, 2000).

2 Important criterion for assessing the quality of university teaching – a high level of students' interest and intrinsic motivation

A great deal of research has been carried out on the issue of "good" university teaching, i.e. high-quality University teaching. The characteristics of "good" university teaching are most often measured by the indicators of good teaching which refer to the lecture structure (organizational aspect of lecture); possibilities of teaching material discussion (critical approach to the teaching material); involvement of an assistant professor and interesting study materials (see Winteler, 2000).
Very little research has been conducted on the issue of how to stimulate students' intrinsic motivation for learning and their interest. The research on the students' academic success very often comprises research of their interests and motivation for work and learning. However, no research has practically been carried out on the issue of students' interest as the *quality* indicator of university teaching. This insufficiency of research on the students' (dis)satisfaction with the studies and students' interest in them is mainly due to the lack of plausible theories of intrinsic motivation and interest in university teaching. In other words, this is due to the lack of valid and reliable instruments for their measuring. In order to be successful in improving the quality of research and teaching on the academic level, we have to base our research on scientific theories. One such theory of interests is to be presented in the following part of this study. However, the crucial metatheoretical issues of intrinsic motivation and interest have only recently started being discussed (see Krapp, 1999).

3 Research of interest in pedagogical psychology and empirical pedagogy: theoretical foundations and (some) empirical findings

It is unquestionable that research of interest and intrinsic motivation (see Krapp/Prenzl, 1992) is very common these days. However, research of interest was neglected in pedagogical psychology and empirical pedagogy for a very long time (see Schmidt, 1980; Wittemöller-Förter, 1993; Müller, 2001). There are two reasons for this: on one hand, the strict scientific (behaviorial) criterion according to which emotions and value judgements cannot be research subjects (and these are very important manifestations of interest), on the other hand, the insufficiently elaborated pedagogical and psychological theory of interests. Psychology has made a few contributions on the issue of interests and these date from the beginning and mid-twentieth century (e.g.

Ostermann, 1912; Berlyne, 1949). Psychological research has always focused on motivation as the dominant problem, and not on interest.

In the 1970's a change occurred in the psychology of motivation. More attention was being paid to the content-related and value aspects of motivation. The aim was to create an ecologically valid and practically relevant know-how. More research was conducted on the issue of the intrinsic motivation. The notions of teaching and learning underwent changes, not only from the (traditional) view of knowledge transfer, but also from the (more recent) perspective of a constructive process of knowledge acquisition.

The issue of interest has been discussed and researched in the history of psychology and pedagogy. However, the *very first theory of interests* (the so-called "Munich theory of interests") and its empirical operationalization was offered by a group of authors gathered around Hans Schiefele and Andreas Krapp (Prenzl/Krapp/Schiefele, 1986; Krapp/Prenzl, 1992; Krapp 1999). Many other, non-German authors (e.g. Müller, 2001a and 2001b) have proclaimed it theoretically and empirically fruitful, in other words - scientifically challenging.

The "Munich theory of interests": basic notions

"This theory defines *interest* as *a relationship between an individual and an object*. The object is defined as an extract of reality that an individual distinguishes from other areas of reality and copies as a limited and structured unit. Concrete objects are necessary for specific object areas. For example, books are necessary for a course in literature, or instruments, musical notes and records for a course in music. These necessary elements are called *referential objects*. They serve as the basis for the reconstruction of a particular object.

An individual's relationship towards the object of their interest can be studied in two ways:

(1) as an actual occupation with the object of interest, as *dealing with the object*. As such, it represents a *connection* (*Beziehung*) between the individual and the object, which forms itself in a particular time and place.

(2) as a permanent interest which manifests itself overtime in repeated encounters with the object, but shows itself only partially from time to time and constitutes a *relationship* (*Bezug*) that exists between the individual and the object of interest, and supersedes the particular time and place context.

Three general directions form the structure of a particular interest relationship, whether as actual connection or permanent relationship:

In the *cognitive* area, the interest relationship to a specific course is highly complex … Its actual implementation (interest connection) manifests itself in the differentiated perception of the object which allows numerous variations, as well as in the wide specters of possibilities for action. The interest relationship that lasts longer manifests itself in differentiated and integrated knowledge about the course.

In the *emotional* area, the interest relationship is marked by stimulating and pleasant sensations that an individual experiences while experiencing his/her object of interest. The interest activity is followed by pleasant sensations, e.g. joy, pleasant tension or "complete preoccupation with the thing" in the sense of flow-experience… That is why the emotional experience of the object in question is positively highlighted, which is typical of the interest relationship. Both spoken and unspoken opinions about the object of interest are followed by pleasant sensations.

In the *value* area, the interest relationship manifests itself as an exceptional evaluation of the object. In the interest connection, the value element is highly "self-

intentional" in activity. Self-intentionality implies that an individual's encounter with the object is valuable in itself and is therefore intended. This activity need not be incited by instrumental purposefulness that supersedes this intentionality. The interest relationship manifests itself in placing the object of interest at the top of one's hierarchy of values. The object affects the formation of one's self-image. The individual acquires his/her identity via his/her relationship with his/her object of interest.

There are two basic features of the interest construct: the basic assumption that the interest construct is defined as a two-way relation (the connection between the individual and the object, and the relationship between the individual and the object), and the determination of the qualities that characterize the interest relationship between the individual and the object. This qualitative determination is sufficient for denoting certain phenomena as «interest». It is possible to further specify their particular qualities, which is necessary for operationalization and which will present empirical proof on the display of interest." (according to Prenzl/Krapp/Schiefele, 1986. p. 166/167)

For more information about the interest construct in this theory, see Krapp, 1998.

The *Questionnaire on interest research* (Schiefele/Krapp/Winteler, 1993) measures the students' interests in their studies, and it starts from the following interest dimensions: emotional attitudes, personal value judgments and intrinsic character.

The results of some empirical research (e.g. Prenzl, 1996; Westermann/Heise/ Trautwein, 1996; Krapp, 1997; Müller, 2000 and 2001) show that interests, among other things, are in relation with students' academic success, their general intellectual abilities and learning strategies. It has been found that students' satisfaction with the studies is connected with their interest. There are indications that the teaching quality, i.e. the instruction quality and students' interests are in an interactive relationship.

4 Satisfaction with study and students' interests: results of empirical research conducted at the Faculty of Philosophy in Zadar

We have participated in a scientific project on the stimulation of interest in university teaching and we have empirically determined the level of students' satisfaction with the studies and their interest in the studies. Apart from determining whether our instruments are valid, (in this phase[1]) our goal has also been to determine the relationship between the expressed students' (dis)satisfaction with the studies and their interest in them.

Research subjects: 411 students of all study groups at the Faculty of Philosophy in Zadar (347 female students and 64 male students). The survey was carried out at the end of the academic year 2001/1002.

Research instruments:

1) The domain-specific interests of participants were assessed using an adapted version of the «Study Interests Questionnaire» (Schiefele, Krapp, Wild & Winteler, 1993). This version was adapted for Croatian population and it

[1] The next phase of our project comprises the monitoring of interest during the years of study (and the role of **high-quality** teaching in this process). The project should end with the experimental testing of various ways of stimulating students' interest in university teaching.

consisted of 25 items. Cronbach's alpha reliability coefficient for this scale was high (0.91)[2].

2) A scale of students' (dis)satisfaction with the studies (Sorić and Palekčić, in press) was used. The scale consists of two sub-scales: «satisfaction with the study contents» and «dissatisfaction with the organization of the studies». The sub-scale «satisfaction with the study contents» includes 9 items. It has one-factor structure and a satisfactory high internal reliability (Cronbach's alpha coefficient 0.79). (Dis)satisfaction with the organization of the studies was measured by a scale of 12 items. This subscale also has the one-factor structure and the satisfactory internal reliability (Cronbach alpha coefficient 0.79).

Some research results:

I Students' interest in the studies

Of the overall number of surveyed students 40% show a high interest in their studies (greater than the arithmetic mean in this scale N = 411; M = 2,96; SD = 0,548). (See Table 1)

II Students' satisfaction with the study contents

Students' satisfaction with the study contents is also high. Over 55% of the surveyed students (M = 3,507; SD = 0.53) are highly satisfied (greater than the arithmetic mean) with the contents. (See Table 2).

III Students' dissatisfaction with the organization of study

Students' dissatisfaction is also very high. Over 50% of the surveyed students (M = 3,558; SD = 0.547) are highly dissatisfied with the organization of their studies. (See Table 3)

III The relationship between the satisfaction with the study contents and (dis)satisfaction with the organization of studies, and the level of students' interest in the studies (See Table 4).

The results show a low and negative (yet significant) correlation between the students' dissatisfaction with the organization of the studies and their satisfaction with the study contents. This leads to the conclusion that the students who are very satisfied with the contents show less dissatisfaction with the organization of their studies. It is possible that they are so intensely focused on the content aspect of their studies that they tend to disregard some bad characteristics of their organization (e.g. much «idling«, outdated equipment, insufficiently prepared lecturers, etc.). However, this correlation is not highly expressed, which proves that the satisfaction with the content and organization of studies are actually two different issues. Students' interest is highly and positively correlated with their satisfaction with the study contents. This could imply that the highly interested students recognize several relevant topics in the content and are therefore more satisfied with it. As this is a correlative type of relationship, it is possible to reverse the process - the students who are more satisfied with the contents will show a greater interest in that content (their satisfaction is characterized by a

[2] The results of validation of study interest questionnaire will be published in a separate work. We wish to point out that the obtained values are more than satisfactory for this particular research.

positive emotional undertone, and this emotional element is very important for the development of interest). Students' interest in the studies has proved to be negatively correlated (low, but significant correlation) with their dissatisfaction with the organization of their studies.

IV. While studying the expressed students' interest in the studies, their satisfaction with the study contents and dissatisfaction with the organization of their studies, we have analysed the following variables:

- if students have enrolled in the desired or substitute studies
- if students would re-enroll in the same studies or not
- if they are male or female students.

A) Desired / Substitute studies

The research results show (see Table 5) that the students who have enrolled in the desired studies are far more satisfied with the content and the studies. However, they are also more critical (more dissatisfied with the organization of their studies) than the students who have enrolled in the current studies as a substitute for the desired ones.

B) Students who would (not) re-enroll in the same studies

The results of the research show that the students who would choose the same studies again are more satisfied with their studies, and they show a greater interest compared to the students who would not re-enroll in the same studies (see Table 6). These two student groups do not show any significant differences on the issue of dissatisfaction with the organization of the studies.

C) Student's gender

If the students' gender is taken into consideration, we can see that male and female students significantly differ in their dissatisfaction with the organization of their studies (see Table 7). The female students are more critical, i.e. more dissatisfied with the organization of their studies. However, male and female students do not differ on the issue of interest in their studies and satisfaction with the study contents.

5 Importance of these research results in a wider, theoretical and practical context of teaching

The starting assumption in our research of students' satisfaction with their studies and their interest in the studies was that the two mentioned variables can be valid efficiency and quality indicators of the studies only if there exists a valid theory of interests. We believe that such a theory is a necessary basis for a more scientifically appropriate analysis of the teaching and learning processes in university education and their improvement. This is why the research results that we have obtained should not be studied only in the context of pedagogical and psychological theory of interests and intrinsic motivation, but also in a wider context with the aim of improving the quality of university teaching. The results of the mentioned empirical research on the students' satisfaction with and interest in their studies point out the heuristic fertility of the "Munich theory of interest". This can also be seen in a comparable study (e.g. expressed students' interest in and their (dis)satisfaction with their studies; the correlation between the students' (dis)satisfaction with their studies - organizational and content-related aspect - and their interest; differences between the students who have enrolled in the

desired studies and those who have enrolled in substitute studies regarding the level of their interest in the studies) with the research results obtained by other authors[3] (e.g. Prenzl, 1996; Krapp, 1997; Müller, 2000 and 2001). The results of this research are also important for the improvement of the teaching and learning process in university education (e.g. Helmke/Krapp, 1999; Winteler, 2001), i. e. for the didactics of higher education (because they would offer a scientific basis for the stimulation of students' interests in university teaching), in other words for teachers' education (Palekčić, 1998). Prominent interest in the studies and marked satisfaction with the studies are not only efficiency indicators of the studies themselves, but also quality indicators of university teaching (see Winteler, 2001). This is best proved by the results that on one hand, refer to the *positive correlation* between the students' satisfaction with the **study contents** and their expressed interest in the studies, and on the other, to the *negative correlation* between their dissatisfaction with the **organization** of their studies and their interest in them. It is our opinion that this is where the evaluation studies of university teaching should be complemented by quality research of university teaching. One of the crucial quality criteria for assessing university teaching is the prominent students' satisfaction with the studies, i.e. prominent students' interest in and intrinsic motivation for the study contents and organization of their studies.

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[3] A comparative study of the results of our research and those conducted by other authors will be presented in a separate work. There we will focus on some results of the research that are specific for the Faculty of Philosophy in Zadar.

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ZAINTERESIRANOST STUDENATA / STUDENTICA ZA STUDIJ I ZADOVOLJSTVO SA STUDIJEM

Ovaj rad prikazuje rezultate empirijskog istraživanja (ne)zadovoljstva studenata organizacijom i sadržajem njihovih studija te područja koja ih zanimaju u sklopu studija. Odabrano je 411 subjekata istraživanja s različitih odsjeka na Filozofskom fakultetu u Zadru. Većina studenata pokazala je veliku zainteresiranost za svoje studije te zadovoljstvo sadržajem studija, ali i nezadovoljstvo organizacijom studija. Njihovo je zanimanje pozitivno povezano s njihovim zadovoljstvom sadržajima, a negativno njihovim nezado-voljstvom s organizacijom studija. Studenti koji su upisali željene studije pokazuju veće zanimanje za studiranje. Oni su također zadovoljniji sadržajem studija te kritičniji prema organizaciji. Drugim riječima: oni su nezadovoljniji organizacijom studija od studenata koji su bili prisiljeni upisati zamjenske studije, budući da se nisu uspjeli upisati na željeni studij. Studenti koji bi se iznova upisali na isti studij, ako bi im se pružila ta mogućnost, također pokazuju veće zanimanje i zadovoljstvo sa sadržajem studija od studenata koji bi promijenili studij kad bi im se pružila mogućnost (ne bi opet upisali isti studij). Studenti i studentice pokazuju jednako zanimanje i zadovoljstvo svojim studijem. Međutim, studentice su nezadovoljnije organizacijom svojih studija od studenata.

Rezultate prikupljene ovim istraživanjem možemo usporediti s rezultatima istraživanja koje su proveli drugi znanstvenici, a oslonjeni su na istu teorijsku osnovu (tzv. «Munich theory of interests») te primjenjuje iste ili slične instrumente istraživanja. Rezultati bi se ovih istraživanja trebali proučavati u kontekstu pedagoške i psihološke teorije interesa i unutaršnje motivacije, no s ciljem poboljšanja kvalitete nastave na fakultetu.

APENDIX

Table 1: Level of expressed interest in the studies (N = 411)

Level of interest	Percentage of students
1.0 < x <= 1.5	0.49
1.5 < x <= 2.0	1.95
2.0 < x <= 2.5	10.95
2.5 < x <= 3.0	45.98
3.0 < x <= 3.5	28.47
3.5 < x <= 4.0	12.16

M= 2.96, SD= 0.548

Note: Students assessed their interest on a four-degree Likert type scale.

Table 2: Level of expressed satisfaction with the study contents (N = 411)

Level of satisfaction with the study contents	Percentage of students
1.5 < x <= 2.0	0.24
2.0 < x <= 2.5	5.11
2.5 < x <= 3.0	11.44
3.0 < x <= 3.5	24.33
3.5 < x <= 4.0	43.80
4.0 < x <= 4.5	12.16
4.5< x <= 5.0	2.92

M= 3.5, SD= 0.53

Note: Students assessed their satisfaction with the studies on a five-degree Likert type scale.

Table 3: Level of expressed dissatisfaction with the organization of the studies (N = 411)

Level of expressed dissatisfaction with the organization of studies	Percentage of students
1.5 < x <= 2.0	0.00
2.0 < x <= 2.5	4.38
2.5 < x <= 3.0	12.41
3.0 < x <= 3.5	24.09
3.5 < x <= 4.0	36.25
4.0 < x <= 4.5	19.71
4.5< x <= 5.0	3.16

M= 3.59, SD= 0.547

Note: Students assessed their dissatisfaction on a five-degree Likert type scale.

Table 4: Correlation matrix for examined variables (N = 411)

Variable	Interest in the studies	Satisfaction with the study contents	Dissatisfaction with the organization of studies
Interest in the studies	1.00	.62*	-.12*
Satisfaction with the study contents	.62*	1.00	-.27*
Dissatisfaction with the organization of studies	-.12*	-.27*	1.00

* - $p<0.05$

Table 5: Results of a two-way analysis of variance - the desired/ substitute studies

Variable	df	F	P	M
Interest in the studies	1/409	**52.98**	**0.000**	M1=3.03 M2=2.62
Satisfaction with the study contents	1/409	**5.93**	**0.015**	M1=3.54 M2=3.37
Dissatisfaction with the organization of studies	1/409	**4.38**	**0.037**	M1=3.61 M2=3.47

Legend: M1 – arithmetic mean of the results obtained from the students who have enrolled in the desired studies (N1 = 339)
M2 – arithmetic mean of the results obtained from the students who have enrolled in the substitute studies (N2 = 72)

Table 6: Results of a two-way analysis of variance

Variable	df	F	P	M
Interest in the studies	1/409	**101.72**	**0.000**	M1=3.06 M2=2.54
Satisfaction with the study contents	1/409	**93.46**	**0.000**	M1=3.62 M2=3.04
Dissatisfaction with the organization of studies	1/409	2.61	0.107	M1=3.57 M2=3.68

Legend: M1 – arithmetic mean of the results obtained from the students who would re-enroll in the same studies (N1 = 331)
M2 – arithmetic mean of the results obtained from the students who would re-enroll in the same studies (N2 = 80)

Table 7: Results of a two-way analysis of variance

Variable	Df	F	p	M
Interest in the studies	1/409	2.36	0.125	Mm=2.88 Mf =2.97
Satisfaction with the study contents	1/409	1.23	0.267	Mm=3.57 Mf =3.49
Dissatisfaction with the organization of studies	1/409	**10.28**	**0.001**	Mm=3.38 Mf =3.62

Legend: Mm – arithmetic mean of the results obtained from male students (Nm=64)
Mf – arithmetic mean of the results obtained from female students (Nf=347)

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Nada Babić

Stanislava Irović
University Josip Juraj Strossmayer in Osijek
Teacher Training College in Osijek

CONSTRUCTIVISM AND EDUCATION OF PRE-SCHOOL TEACHERS

Constructivism as a theoretical framework, or a set of approaches and/or methods and principles, interprets the nature of knowledge and the process of cognition. Every attempt to interpret constructivism must take into account its fluid nature and various «directions» (trivial/personal, radical, social, cultural, holistic constructivism). Therefore, every discourse on constructivism imposes the necessity of consensus or at least the minimal level of intersubjectivity in order to articulate various interpretations, to overcome simplifications, which enables communication among its supporters and critics.
Even though, originally, constructivism was the theory of learning and not teaching, it possesses various pedagogic implications that are being discussed in this paper.
Consistent application of constructivist approach in the course of education of pre-school teachers gives them a theoretical framework for the understanding of teaching and learning, of their own roles and educational strategies. Constructivist design of teacher education, together with critical analysis and structural reflection on formal and practical part of instruction implies changes on the level of goals and educational methodology. An active role of students in the process of understanding of conceptual and practical dimensions of a constructivist model is a prerequisite for its interpretation, redefining and integration in a personal value system and educational practice.
Constructivism is not seen as the only possible and comprehensive theoretical framework of learning and teaching but as an approach that gives a possibility to a teacher to mediate between child/student knowledge and the everyday reality in an appropriate way.

Constructivism and its many faces

Constructivism is usually used as a broader term for a set of theoretical models originally directed towards the phenomena of knowledge, cognition and learning as well as educational approaches to teaching (Dougiamas, 1998; Smith, 1999). Constructivism is based on the idea of learning as a process of an active exploration of new pieces of information and creation of new knowledge through the integration of new information with one's previous experience. The generation of new knowledge activates one's cognitive structures. New knowledge is created through an active involvement and not through imitation or repetition. It is created through construction, and not transmission. A learning individual is for constructivists the creator of meaning. Consequently, knowledge is not a set of facts, rules, and principles that «wait» to be discovered. It does not exist independently of the person that is learning, but it is constructed by that individual in his/her attempt to give meaning to his/her own experience.

A student, being a constructor of his/her own knowledge and meaning, needs the liberty to form his/her own process of learning – possibility to direct it to those areas not previously planned by an adult/teacher or not in the pre-school/school curriculum. The child needs opportunity for reflection on his/her own learning and metacognition. Constructivist learning environment enables an active search, problem solving, and co-operation. Reflection on learning and the analysis of the way in which knowledge is

constructed improves the process of learning. Constructivism focuses on learning and not on its product.

However, constructivism is not a monolithic theory but a set of approaches that vary from trivial and radical constructivism to the social one. Some of its subdivisions (cognitive, radical, social, holistic, cultural) should not be seen as a fixed system of beliefs but directions or «loosely defined» viewpoints represented by certain authors (Babić, Irović, 2001; Dougiamas, 1998; Dwayne, Olsen, 1998). Piaget, a pioneer of a constructivist theory, is a representative of a personal constructivism, the idea of knowledge as a personal construct. Personal constructivism separates an individual process of knowledge acquisition from a social process of mutual understanding. Student's activity, taken from Piaget's model of self-regulation and self-construction, is a fundamental element of personal constructivism.

Radical constructivism considers cognition to be a process of dynamic adaptation and interpretation of experience where knowledge construction does not necessarily reflect the reality. Radical constructivism does not negate the objective reality. It only claims that there is no way of understanding it – knowledge is a subjective construct. Communication, therefore, implies not identical but compatible meanings shared by the communicating subjects. These new approaches result in rejection of conservative standpoints about teaching as «lecturing» or «transfer» of information. Application of constructivist theory in the practice of teaching relies on two models – cognitive constructivism (Piaget) and social constructivism (Vygotsky). Piaget's model focuses on an individual and the process of his/her construction of meaning; Vygotsky's model puts this process in the social interaction.

Social constructivism emphasizes the social nature of learning, not trying to deny its individual dimension (John-Steiner, Mann, 2002). Individual and social aspects of learning are in a reciprocal and spiral relationship (Dougiamas, 1998). Semiotic mediation is a way of social and individual functioning. Social constructivists think that individual learning is a socially mediated, supported by more competent members of the culture, while an individual can take part in the learning of a community. An individual creates meanings while interacting with others and the environment. The prerequisite for the interaction is intersubjectivity, a mutuality of meaning, created through an agreement. Vital importance for a child's/student's learning is the quality of interaction with competent others (adults and peers) that takes place in the zone of proximal development and that enables a child to do things he/she would not be able to perform on his/her own (Kim, 2001).

Personal and social constructivisms are not irreconcilable; they are actually complementary because they both consider knowledge to be a self-regulated construct, and the only difference is in interpreting the role of social interaction. Piaget, although a supporter of the idea of individual cognitive development, is also aware of the importance of the language and social interaction for cognitive development (Cole, Wertsch, 1996).

The discourse on constructivism imposes the need for consensus or at least a minimal level of intersubjectivity (Chronaki, 2002) that is stimulating for the articulation of various interpretations as well as for communication among supporters and critics of constructivism (Roberts-Miller, 2002). We find it, therefore, necessary to warn about simplifications in interpretation of constructivism. One of them is seeing constructivism simply as personal/trivial constructivism and claiming that the creation of knowledge takes place in the social isolation. This view is also reflected in the design of teaching – avoidance of any sort of mediation, guidance, and instruction in the

process of learning. Constructivist design of learning/teaching does not reject instruction, it only redefines it. Non-directional teaching, guidance, direction opens up new possibilities for self-initiated learning, the freedom of action, and the possibility of personal expression.

It is also a misconception that constructivism refuses completely academic, formal knowledge. Namely, constructivists do not reject the need for formal knowledge; they only insist that knowledge be integrated with students' real-life experience, viewpoints and ideas at the moment of new knowledge construction (Maypole, Davies, 2001).

Pedagogical implications of constructivism

"Student must be permitted the freedom to think, to question, to reflect, and to interact with ideas, objects, and others – in other words, to construct meaning." (Brooks, Brooks, 1999, 8)

The notion of a student as a constructor of knowledge and creator of meaning also revises views about teaching. Values of direct instruction, memorization and repetition, rigidly defined curriculum, standardized tests, and teacher's traditional role as a mediator of knowledge are being negated or at least made relative. Constructivism is focused on a student as a unique individual. It stresses the importance of the learning environment as a living context of relevant learning that provides various viewpoints and representation of content, encouraging a student to synthesize and integrate. Higher mental operations (ability to solve problems) are being favoured (Jonassen according to Allen, Carmona, Calvin, Rowe, 2000). Constructivist theoreticians claim that students improve their critical thinking and skills of problem solving generating new knowledge on the basis of experience and numerous external sources. Combination of previous knowledge, independent research, and direct instruction expands the knowledge basis.

Constructivists do not see the teacher's role in transmission of knowledge but in motivation of students, creation of opportunities for active learning experience, and creation of a stimulating learning environment. The teacher becomes a co-ordinator, facilitator, advisor, and coach. The teacher's role is not guidance of students, «step-by-step», along the «well-known path» any more; it is to stimulate children to find their own paths. A constructivist teacher partly gives up power and control both over the process and the results of learning. The goals of instruction are negotiated, not imposed. In order to encourage cognitive development, a constructivist teacher creates and organizes a stimulating learning environment, adjusts his/her actions to spontaneous, mental activities of students, and provides examples and questions that guide students to question and reconstruct knowledge (Green, Gredler, 2002; Simpson, 2001; Wilson, 2002). Constructivists' thesis that new knowledge is based on previous experience includes, also, the teacher's familiarization with individual level of student's development. Consequently, the teacher offers the degree of a support in consistence with the actual and potential level of student's development.

A teacher provides students with opportunities for collaborative learning, exposing them in that way to the viewpoint of their peers and using the effects of social and cognitive conflict. According to the constructivist teacher who considers education and achievement of curriculum goals to be the result of children's learning through solving of cognitive conflicts by means of experience, reflection and metacognition, and critical thinking is at the heart of teaching and learning (Maypole, Davies, 2001; Davis-Seaver, Smith, Leflore, 2001).

Collaboration among students, and not competition, enables collaborative construction of knowledge. Collaboration is a step further from co-operation, because it implies exchange of personal reflections and mutuality of goals. This gives a possibility to every member in a group to become familiar with other people's views, i.e. with multiple perspectives. Diversity among students regarding their cultural background and the level of competence is used for creation of new classroom dynamics.

Zahorik (1995) puts a special emphasis on the importance of following consisting parts of a constructivist teaching practice: (1) activation of previous knowledge as a «bridge» to new knowledge, (2) familiarization with the whole unit, and not fragments of knowledge, (3) comprehension of new knowledge and exchange with others, (4) using knowledge for solving problems, (5) reflection on knowledge – for the sake of decontextualisation.

Key features of the constructivist approach to education are: emphasis on student, and not on teacher, learning process is a process of cognitive construction, learning happens through active manipulation, new learning relies on the activation of previous understanding, learning is most efficient in a rich and complex environment, where it is possible to use original, primary, sources, social and cultural context, while solving of relevant problems increases authenticity and motivation for learning.

The value of constructivist approach to education can be achieved under the condition that the teacher follows and questions the influence of applied authentic constructivist projects on students (Alesandrini, Larson, 2002).

Constructivism in education of pre-school teachers

In order for a teacher, even a pre-school teacher, to become a «constructivist teacher», it is necessary to structure his/her education around constructivist principles and practices (Brooks, Brooks, 1993; Sluss, Minner, 1999). That means that a constructivist approach is consistently applied during their education, combining indirect styles of mediation, guidance, and supervision as well as optimal «field experience» where students take part in authentic educational situations. It is vital that, in the course of education of future teachers, they behave as active agents who bring their own experience and learning styles into the educational process, create them or construct through interaction with ideas, events and activities they come across. This, however, requires an atmosphere of mutual respect, collaboration, tolerance, and free expression. The role of an «instructor» helps students understand their own expectations and value systems, recognize their own «strengths and weaknesses» and plan how to achieve their goals.

An integrated holistic programme, at the level of curriculum and practice, that follows the constructivist approach is based on the analysis of teacher's roles, present and future ones, identifying appropriate knowledge, skills and viewpoints i.e. value systems. Constructivist design of teacher education consists of the following: (1) research, (2) invention, (3) implementation, (4) evaluation and (5) exchange (Alesandrini, Larson, 2002). *Research* includes development and context formation, clarity of the task/goal, asking and predicting of questions and the search for the solution. *Invention* consists of planning and model building and sometimes overlaps with *implementation,* which questions and modifies models. *Evaluation* is based on checking up, interpretation, and reflection of experience. *Exchange* is building of mutuality through presentation of the achieved to others, through explanation of criteria, procedures, and results accompanied by the sense of achievement and pride.

A valuable part of the constructivist-teaching model is the development of critical thinking skills. It is the result of the freedom of choice and research, evaluation of personal visions, discovery, and self-evaluation. This all represents the interdisciplinary, holistic approach, collaborative activity, and practical experience that offer the opportunity for learning through experience. Constructivist programme of education prepares a teacher to encourage a child/student to construct and deconstruct his/her knowledge, to explore his/her own actions and behaviour, and to consider alternative concepts. Consequently, teacher education has included critical analysis and structured reflection on the formal and practical part of education.

According to Yore (2000,2) the constructivist approach to education is characterized by: "More emphasis on:

- Understanding and responding to individual students interests, strengths, experiences, and needs
- Selecting and adapting curriculum
- Focusing on student understanding and use of scientific knowledge, ideas, and inquiry processes
- Guiding students towards an active and extended scientific inquiry
- Providing opportunities for scientific discussion and debate among students
- Continuously assessing student understanding
- Sharing responsibility for learning with students
- Supporting a classroom community with cooperation, shared responsibility, and respect
- Working with other teachers to enhance the science program."

Practical experience is a crucial part of constructive preparation of future teachers. Teacher development implies his/her participation in the community of practitioners, even at the stage when they are still students. Supervision by senior expert teachers is a vital prerequisite for a high quality practical training of students. However, next to the «classroom» expertise, the supervisor also needs the expertise in the art of guidance and supervision of students. Very frequently it is exactly this competence that is missing; they lack the knowledge, skills and support. Besides, supervisors and methodologists do not always co-operate together; sometimes competences remain undefined, status unprofiled, mutual insight missing (Zeichner, 2002).

An effective practical training experience is characterized by: an active participation of students in kindergarten/school activities, reflective notes on personal experience, analysis of first attempts with the consequent consultation with the supervisor, methodologist, and other students. Comparison of perceptions of an educational situation offers a better understanding of that practical experience. Furthermore, students are more effective in solving problems and getting ideas if they are presented in a holistic way.

The importance of the above-mentioned conceptual and practical applications in the education of pre-school teachers is further emphasised by the rich experience of the Osijek's Department for pre-school education:

- Changes at the level of goals and methodology of education referring directly to learning strategies and changes in ways of teaching – the dominating role of classical student space and lectures should be replaced by interest groups and co-operative learning; traditional media should be complemented by contemporary ones.

- Changes in mental organisation and representation of knowledge – instead of skill training i.e. emphasis on behavioural achievements (Babić, Irović, 2000).

During the work with students it was perceived that a global, holistic approach to education of pre-school teachers promotes the importance of their personality – the basic variable in the context of institutional pre-school education. A higher level of sensibility and flexibility, better teacher understands of knowledge, and individual beliefs and skills becomes the starting point for personal educational practice. Active forms of teaching/learning (individual narratives, discussions, role plays, simulations, brainstorming sessions, interactive workshops...) provide a future teacher with a set of initial competences through various interaction and co-operative contexts (pair work, group, team work, work with colleagues, supervisors and methodologists), and structured and real practical situations (from a lecture hall to the classroom). Student's personal learning experience, based on constructivism, has a «feedback» effect on their pre-school practical work.

In the course of student education, a special attention was given to the development of the ability for reflection and self-reflection as critical values of a «constructivist teacher». It is based on the information about evaluation and self-evaluation. As a result, those two elements are present at all the stages of education. A methodologist, a supervisor, fellow students through collaboration and co-responsibility, continuous analysis, refocusing and adjustment help realize their personal theory of action. Of course, this is not possible without continuous monitoring, supervision, and student guidance thoughout their practical training programme. However, this part of the programme is sometimes considered to be a less important complement to the theoretical part, with exercises, seminars and practical student work being looked down on. Consequently, teachers «in charge» of this part of education often have only a marginal importance in the academia (Babić, Irović, 2000). Besides, according to Zeichner (2002), those educators are also overloaded with obligations to supervise and analyse students' «practical classroom work», an important part of a job not always appropriately validated.

It is important to warn about the following – even when future teachers have been taught about constructivism in a constructivist way, they are bound, once they find themselves in the classroom, to be confronted with a problem of the application of theoretical foundations i.e. «a conceptual tool of constructivism» in practical educational situations. All the difficulties connected with its application in practice are results of a fact that it is first and foremost a theory about learning and not about teaching. This difficulty will increase if constructivism was taught to teachers in a traditional way. According to constructivism, if people learn through «doing» it is not possible to apply a transmission model and teach constructivism. Still, it is not uncommon that students listen to «lectures» about constructivism without any possibility of exploration and discovery, construction and reconstruction of knowledge without participation in a «constructivist classroom». The absence of the personal experience of a constructivist learning/teaching will most probably result in replication of the transmission model used in education of future teachers. Theoretical knowledge and skills acquired during formal education are integrated in new teachers' system of knowledge and values, whereas the whole process is determined by the level of congruity between individual values, former experience and the way of internalisation and transformation of new knowledge and experience (Babić, Irović, 2000; Cook et al. 2002; Tatto, 1998).

Good student instruction requires stepping out of traditional educational structures and abandoning traditional instructional strategies and conventional methods (Alesandrini, Larson, 2002; Romanowski, Oldenski, 1998; Zeichner, 1996, 2002). Constructivist approach to teacher education requires fundamental changes in all aspects of their teaching and learning.

Constructivist theory has an application potential, but first it is necessary to solve the problem of its transformation into educational practice (Maypole, Davies, 2001). It is expected that teachers who were subjected to the constructivist educational approach are more receptive for its implementation in their own educational practice.

Numerous research studies (Alesandrini, Larson, 2002; Cook et al. 2002; Maypole, Davies, 2001) have indicated the importance of student's perception of his/her own learning experience. Students who were taught in a constructivist way report about better insight into their own experience, better understanding and global interpretation of the acquired material, about intrinsic motivation and an increased interest for material, the feeling of better control and autonomy, competence, and achievement. They think that the constructivist approach offers «a wider picture» of the acquired knowledge and their own personality in the process of learning. Constructivist educational practice cannot be achieved without the teacher's autonomous and informed judgement and choice (Brooks, Brooks, 1999). However, the integration of a constructivist approach into the personal teaching practice does not go «smoothly». The important prerequisite is a student who actively understands and accepts conceptual and practical dimensions of the constructivist model as well as its redefinition and integration into the personal value system and educational practice. This can be achieved through the process of a gradual individual development. A good example of such a process can be seen in the study of Tracy and her transition into a «constructivist teacher» (Cook et al. 2002.). Tracy, one of the best students of a university educational programme for primary school teachers, upon her completion of the university course, starts working on her new job. The study follows Tracy and her personal conceptualisation of teaching, the formation of which started already at Tracy's formal professional education, where she was exposed to the constructivist model of teaching and continued with the insight into her own beginner's professional experience. A programme of Tracy's university course presented constructivism as the best theoretical framework for the understanding of learning and teaching. Various lecturers applied, within the framework of that course, the constructivist approach (i.e. personal interpretation of that approach, with a various level of consistency), and her field experience took part in «constructivist classrooms». And yet, Tracy awaited a long and troublesome process of understanding and accepting the constructivist model and the development of skills needed for its implementation.

Teaching is a complex and a highly personalized process and, therefore, every teacher has to create his/her own «bridge» to constructivist teaching (Brooks, Brooks, 1999; Kaye, 2002; Alesandrini, Larson, 2002).

A final challenge that constructivism puts before teachers is the danger to «get trapped» into thinking that constructivism is the only possible theoretical framework for teaching and learning. Danger lies also in favouring only one of the possible ways to interpret constructivism, although those ways are not always incompatible. Therefore, it is vital that future teachers be warned about various viewpoints and develop their competence to understand, interpret and choose their personal approach.

Understanding and acceptance of constructivism is a prerequisite for the quality of its application in pre-school and school practice. This includes a constructivist

teacher capable of playing a role of a mediator between present child's/student's knowledge and everyday reality, of being a creator of an encouraging learning environment – the one that leads towards more complex understanding and development, and of applying the teaching strategy that promotes student's success, expertise and autonomy.

So far, awareness of the possibilities to apply constructivism in the education of pre-school teachers confirms the developmental value of social and cognitive co-ordination of the participants in the process of learning and teaching. Therefore, in our current research project *Constructivism and the developmentally appropriate pre-school practice,* we focused our attention on the question of the possibility to apply a constructivist learning/teaching strategy in children's education and the education of pre-school teachers.

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KONSTRUKTIVIZAM I OBRAZOVANJE PREDŠKOLSKIH UČITELJA

Konstruktivizam kao teorijski okvir, ili skup pristupa i/ili metoda te principa, tumači prirodu znanja i kognitivni proces. Svaki pokušaj tumačenja konstruktivizma mora uzeti u obzir njegovu fluidnu prirodu i različite «smjerove» konstruktivizma (trivijalni/osobni, radikalni, društveni, kulturalni, holistički konstruktivizam). Stoga svaki diskurs o konstruktivizmu nameće nužnost konsenzusa ili, u najmanju ruku, minimalnu razinu intersubjektivnosti kako bi se artikulirala različita tumačenja, izbjegla pojednostavnjenja, što omogućuje komunikaciju između njegovih zagovarača i kritičara. Iako je, u početku konstruktivizam bio teorija učenja, a ne teorija nastave, on posjeduje razne pedagoške implikacije koji se razmatraju u ovom članku. Konzistentna primjena konstruktivističkog pristupa tijekom obrazovanja predškolskih učitelja pruža teorijski okvir za razumijevanje nastave i učenja te njihovih vlastitih uloga i obrazovnih strategija. Konstruktivistički oblik obrazovanja učitelja, skupa s kritičkom analizom i strukturalnom refleksijom na formalni i praktični dio nastave, ukazuje na promjenu na razini ciljeva i obrazovne metodologije. Aktivna uloga učenika u procesu razumijevanja konceptualnih i praktičnih dimenzija konstruktivističkog modela preduvjet je njezinu tumačenju, redefiniranju i integraciji u osobni sustav vrijednosti te obrazovnu praksu. Konstruktivizam se ne smatra jedinim mogućim i sveobuhvatnim teorijskim okvirom učenja i nastave, već pristupom koji nastavniku pruža mogućnost da bude posrednik između znanja djeteta/studenta i svakodnevne stvarnosti.

UDK 371.21(497.5)

Anđelka Peko
University Josip Juraj Strossmayer in Osijek
Faculty of Philosopy in Osijek

Marija Sablić
University Josip Juraj Strossmayer in Osijek
Teacher Training College in Osijek

TEACHING AS A (NON-)MUTUAL PROCESS

This paper tries to answer whether changes have to be brought into school and into teaching.
The research was conducted with the sample of 234 students and 55 teachers in primary and secondary education. The research points at an overstressed role of the oral presentation method (54, 6% of secondary school students, 75% of primary school and 83, 9% of secondary school teachers). Group work and collaborative work are neglected. They are used in the fourth grade of primary school 44.4% of the teaching time; the percentage of its usage in secondary school is 17, 7%. It is not used at all in the eighth grade of primary school.
The teaching that is allowed in our schools supports the role of students as passive listeners and stimulates writing notes. A simple formula is present: the teacher explains and asks questions, and students reply in order to meet the demands of the curriculum. All activities are initiated by the teacher, who gives shape to a teaching that is directed towards himself/herself. Such teaching puts an emphasis on the following: teacher's monologue, the non-structured work, students' response, non-stimulation of students' initiative, and collaborative learning.

Teaching is a purposeful process subjected to continuous change. When talking about school today, especially with regard to teaching as the most organized school activity, G. Dryden and J. Vos (2001) emphasise the importance of finishing school armed with the skill to act independently, learn independently and control one's own future independently.

Many researchers, such as Bratanić (1980), Nutthall and Snook (1977), Flanders (1970),Vukanović (1980), Hage et al. (1985), Rosenshine (1987), Terhart (1988), Peko (1992) have been involved with research on teaching. They pointed out some good and bad sides of teaching. They analysed and stressed the necessity for innovations in teaching.

In order to change the teaching process, we need to start from the notion of the teaching process that teachers and students have. Rogers (1976) stresses that the self-confrontation leads to a more flexible conception of the process we create, and that it might be used for a constructive change of behaviour. The question this paper is trying to answer is whether change should be brought into school and teaching.

Objectives, instruments and hypotheses of the research

This research was aimed at the teachers' and students' perception of teaching when they themselves jointly gave shape to the teaching, as well as at their willingness to introduce changes into teaching. To find out about it, it was necessary to investigate the following:

- presence of different teaching methods
- application of different teaching sources
- techniques that measure achievement levels

- application of collaborative learning
- presence of out-of-the-classroom teaching
- satisfaction with personal involvement and involvement of others in the teaching process
- relation to changes.

For the purpose of the research, a questionnaire was made for students, and its parallel form for teachers. We started with the assumption that students and teachers have a different understanding of the concept of teaching although they shape it together.

Sample

The sample consists of students and teachers from the eastern part of Croatia with 234 students of primary and secondary school tooking part in the research. They were homogenized in terms of age (4^{th} and 8^{th} grade of primary school, and 1^{st} and 4^{th} year of secondary school, school of economics).
The research also involved 55 primary and secondary school teachers.

Subjects-students

School	**No.**
Primary school Antun Kanižlić, Požega	49
Primary school Sveta Ana, Osijek	55
School of economics, Požega	71
School of administration and economics-Osijek	59
Total:	234

Subjects-teachers

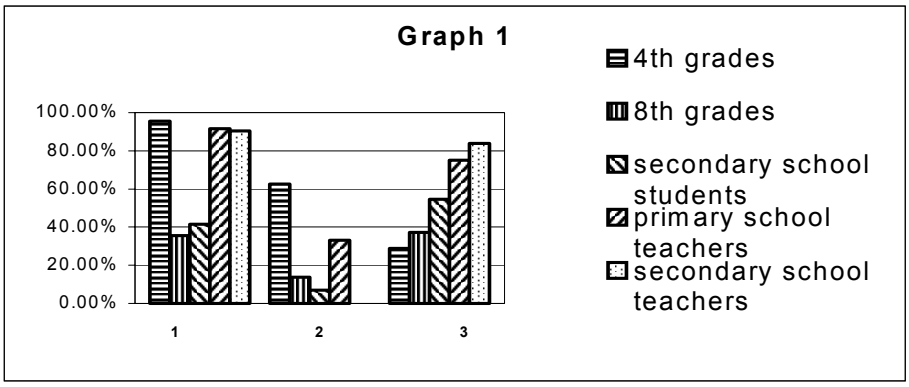
School	**No.**
Primary school Antun Kanižlić, Požega	12
Primary school Sveta Ana, Osijek	12
School of economics, Požega	24
School of administration and economics-Osijek	7
Total:	55

Along with percentage and distribution correlations (answers by 4^{th} and 8^{th} grade students, secondary school students and teachers), we also did the chi-square test.

Results and discussion

- **The presence of different teaching methods**

Results on the attitude towards the presence of different teaching methods were obtained by the analysis of the answers to question 1 shown in graph 1.

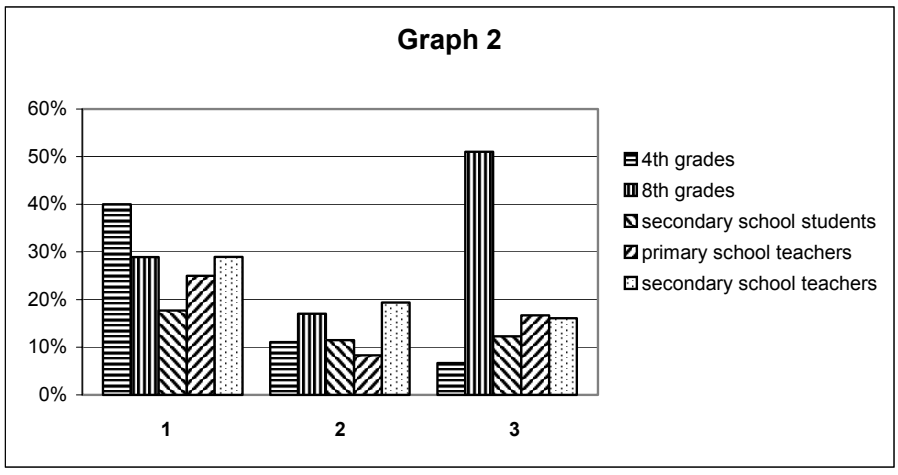


1 – Independent work on the basis of textbook
2 – Independent work on the basis of project work
3 – Application of the oral presentation method

Independent work on the basis of textbook is used by 95,5% of 4th grade pupils in primary school, 35,5 % of 8th grade students, and 45,5% of secondary school students. To the same question a positive answer was given by 91% of primary and 90% of secondary school teachers. Independent work on the basis of project work is used by 63,3% of 4th grade pupils, 13,6% of 8th graders, and only 6,9% of secondary school students. 33,2% of primary teachers responded affirmatively to the same question, whereas secondary teachers do not use this type of work at all.
Oral presentation method is used by 28,9% of 4th graders and 37,3% of 8th graders, and 54,6% of secondary students. 75 % of primary teachers and 83, 9% of secondary teachers report using the same method. Chi-square is 20, 8 and it is statistically significant, which indicates that, although they shape the teaching together, teachers and students do not experience teaching in the same way.

- **Application of different teaching materials**

The results on attitudes about the application of different teaching material are presented in the following graph. Both students and teachers report in their answers about the use of different teaching materials.



1 – Scientific literature
2 – Fiction
3 – Internet

To the question whether they use scientific literature as a teaching source often, a positive answer was given by 40% of 4th graders, 28,9 % of 8th graders, and 17,7% of secondary students. The same question was positively answered by 25% of primary school teachers and 29% of secondary school teachers.

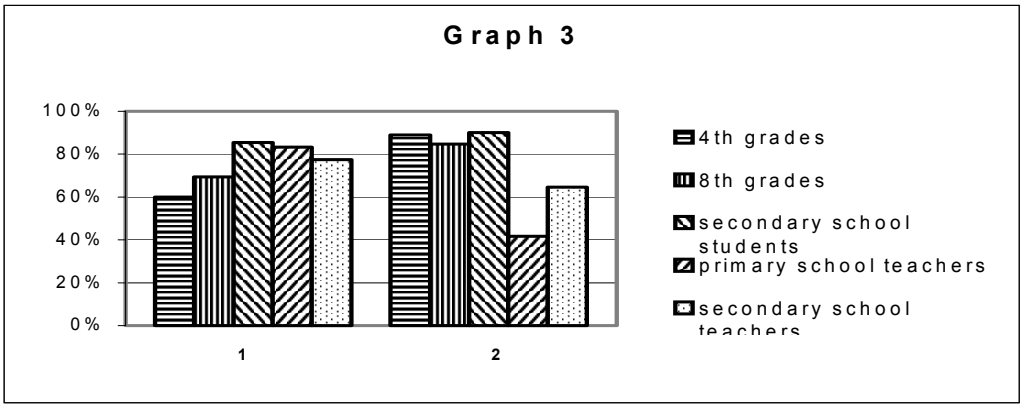
Fiction as a teaching source is mentioned by 11,1% of 4th graders, 17% of 8th graders and 11,5% of secondary students. Fiction as a teaching source is often used by 8,3% of primary teachers and 18,6% of secondary teachers.

To the question about the use of the internet as a teaching source, 6,1% of 4th graders responded positively, as well as 51% of 8th graders and 12,3 % of secondary students.

An affirmative response to the same question was given by 16,7% of primary teachers and 16,1% of secondary teachers. There are obvious differences in the distributions of the answers given by 4th and 8th graders of primary school. Answers given by students and teachers in secondary school are identical.

- **Techniques for the measurement of achievement**

The graph below shows the distribution of answers related to the measurement of student's achievement.



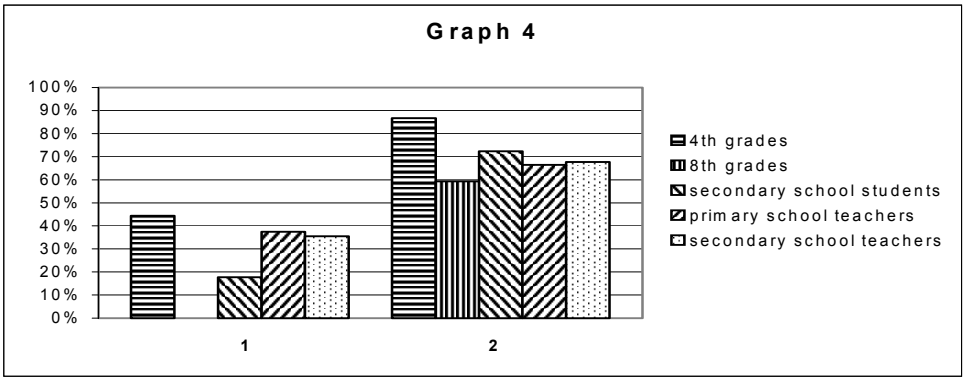
1 – Oral examination
2 – Written examination

To the question whether teachers often measure students' achievements by oral examination, 60% of 4th graders responded positively as well as 69,4% of 8th graders and 85,4% of secondary students. To the same question the answer OFTEN was given by 83,3% of primary teachers and 77,4% of secondary teachers.

To the question whether teachers often measure students' achievements by written examination, 88,8% of 4th graders gave a positive answer as well as 84,7% of 8th graders and 90% of secondary students. To the same question the answer OFTEN was given by 41,7% of primary teachers and 64,6% of secondary teachers. Chi-square of students' and teachers' answer distribution is 7, 07, which points at their disparity.

- **Application and attitudes towards collaborative work**

The following graph presents how the application of collaborative work is experienced.



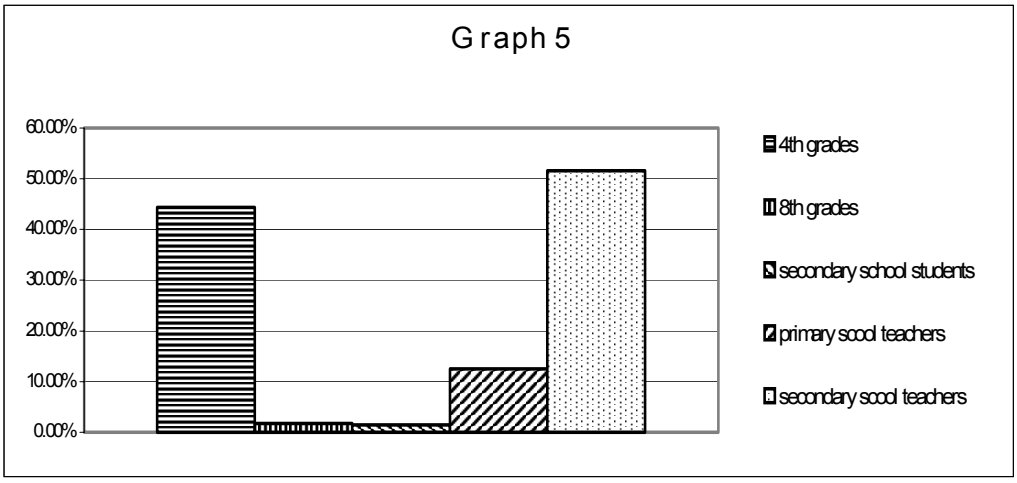
1 – collaborative work was applied often
2 – collaborative work is found more efficient than lecturing

To the question whether collaborative work was applied often, the answer given was positive with 44,4 % of 4th grade pupils, 0% of 8th grade students and 17,7% of secondary students. The same answer was given by 37,5% of primary teachers and 35.5% of secondary teachers.

87,8 % of 4th graders find collaborative work more productive, as well as 60% of 8th grade students and 72,2% of secondary students.

It is also found better by 66,5% of primary teachers and 67,7% of secondary teachers. The distribution of answers by students and teachers is obviously identical.

- **Presence of out-of-the-classroom teaching**



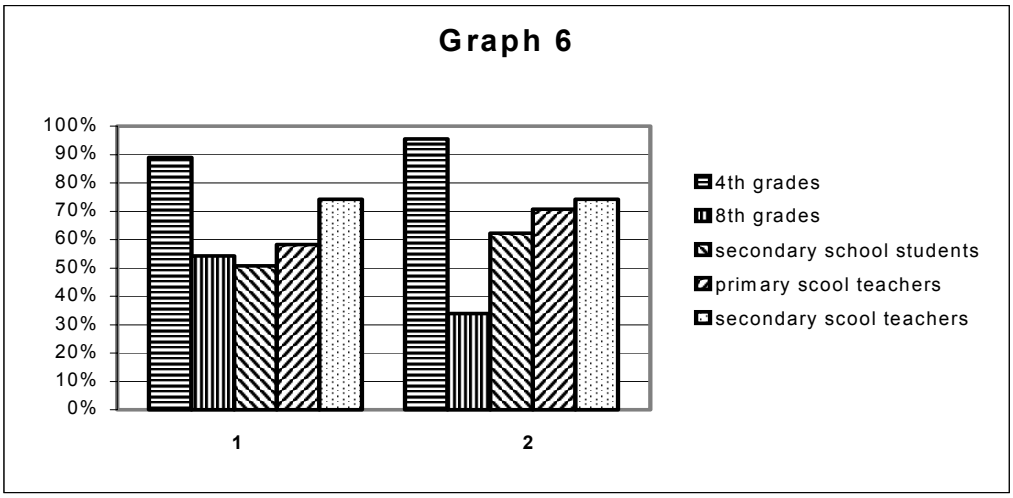
Graph 5 illustrates answers about the application of out-of-the-classroom teaching.

44,4% of 4th graders, 1,7% of 8th graders and 1,5% of secondary students reported about the application of out-of-the-classroom teaching.

The same answer was given by 12,5% of primary teachers and 51,6 % of secondary teachers. The distribution of answers given by students and teachers does not correlate.

- **Satisfaction with personal involvement and involvement of others**

Answers related to a positive attitude towards personal and teacher involvement is shown in graph 6.



1 – satisfaction with student involvement during the lesson
2 – satisfaction with teacher involvement during the lesson

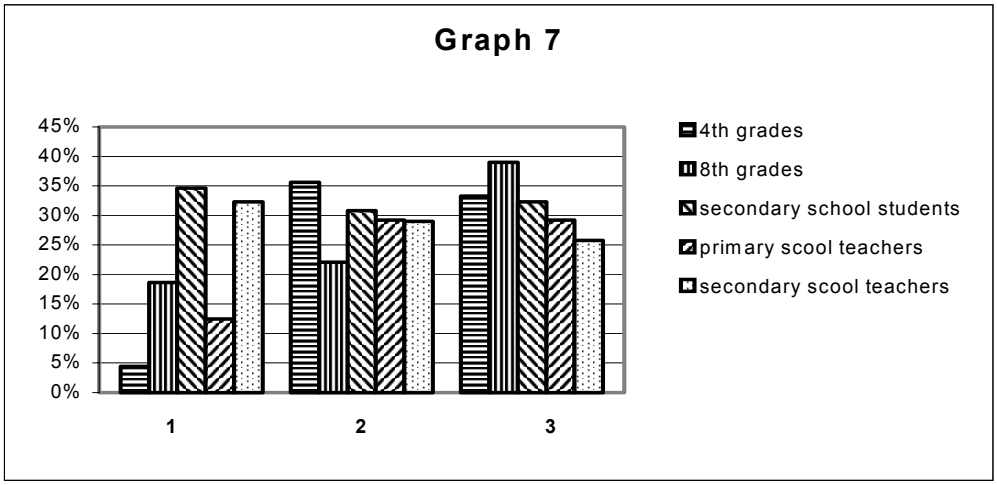
88,9% of 4th graders, 54,2% of 8th graders and 50,8% of secondary students reported that they were satisfied with how active they were during the lesson. To the question whether they were satisfied with how active their students were, 58,3% of primary teachers and 74,2% of secondary teachers answered positively.

95,6% of 4th grade pupils, 33,9% of 8th grade students and 62,3% of secondary students expressed their satisfaction with the teacher's involvement.

A positive answer was given by 70% of primary teachers and 74,2% of secondary teachers to the question whether they were satisfied with their involvement during the lesson. 4th graders are extremely satisfied with their work and their teacher's work in the teaching process. The answers given by 8th graders, secondary students, and primary and secondary teachers are identical.

- **What is it that students and teachers want to change in the teaching process**

Suggestions about changes of certain parts of the teaching process are shown in graph 7.



1 – Teaching methods
2 – Classroom organization
3 – Overall teaching

To the question about what it is in the teaching process that should be changed, 4,4% of 4th grade pupils, 18,6% of 8th grade students and 34,6% of secondary students responded that they would change the methods of teaching. Also, the teaching methods should be changed in the opinion of 12,5% of primary teachers and 32,3% of secondary teachers. Classroom organization should be changed in the opinion of 35,6% of 4th graders, 22,1% of 8th graders and 30,8% of secondary students. The same question of change is thought by 29,2% of primary teachers and 29% of secondary teachers. The approach to changing teaching in general was the following: 33,3% of 4th graders, 39% of eight graders and 32,3% of secondary students, 29,2% of primary teachers and 25,8 % of secondary teachers. There is a correlation in the distribution of answers to the question about changes in the teaching process given by the students and the teachers.

Analysis of the Results

Lecturing is the dominant type of teaching. In the last two decades this type of teaching has been used in didactical theory and teacher education as a didactical means of intimidation. It serves to show what MUST NOT be done, whereas at the teaching level it is still a harsh reality (Terhart, 2001).

McLeisch's claim (1976) that teaching has been an anachronism since the invention of the printing machine can be transferred to our teaching reality too. The form of teaching that is supported is the teaching that tolerates passive listeners and stimulates note-taking. A simple formula can be found: teacher explains and asks questions, and students answer with the aim of meeting the demands of the curriculum. All activities are initiated by the teacher who shapes the teaching directed towards her/him self. Our research points at the overstressed role of the oral presentation method. This is reported by 54,6% of secondary students and 75% of primary teachers and 83,9% of secondary teachers. Group work and collaborative learning are neglected. They are used in the fourth grade, 44,4 % of the teaching time, and in secondary school but only 17,7 % of the time, whereas in the eight grade it is not used at all. Subsequently, such teaching is characterized by the method of monologue, a non-

structured work on students' responses; it does not stimulate students' initiative and collaborative learning.

The form of teaching that is supported gives a more important role to the correct answer, rather than to the understanding of the concepts underlying the problem (L. Stoll, D. Fink, 2000).

The teaching material is mostly revised by reproduction (91,1 % of 4th graders, 56% of 8th graders and 56.2% of secondary students, also confirmed by 54, 2% of primary teachers and 77,4% of secondary teachers). Oral examination is still the most common, although extremely subjective. It is mostly used in secondary education (60% of examination time in 4th grade, 69,4% of examination time in 8th grade and 85,4% of examination time in secondary school).

R. N. Caine and G. Caine think that one of the functions of education should be preparation of students for real life. Students should find out about real-world expectations, challenges and what it is that they are capable of doing.

It seems as if it is believed that school fulfills these tasks. In reality, it is not the case. It is exactly the opposite. Such education fosters delusions and conceals real challenges.

The only places which have not experienced change and where everything functions the way it was 50 years ago would be local schools (according to G. Dryden, J. Vos, 2001). Such a state of our school does not give satisfaction to the students or the teachers. Students would like to be more active; 54,2% of 8th graders and 50,8% of secondary students are satisfied with their involvement in the teaching process. The dominant role of the teacher satisfies only 33,9% of primary students and 62,3% of secondary students. Both students and teachers wish for changes in the teaching process. 33,3% of 4th graders, 39% of 8th graders, 32,3% of secondary school students, 29,2% of primary school teachers and 25,8% of secondary school teachers would like to change the overall teaching.

Traditional education is old-fashioned and needs change. It is necessary to transform strict leadership into "self-directed" learning founded on the contemporary principles of cognitive science, invention, discovery of meaning, absorption, and self-evaluation.

Conclusion

Our research showed that the subjects involved in the study about the different elements of the teaching process (different teaching methods, teaching materials, evaluation techniques, out-of-the classroom teaching) differ in their attitudes towards the very same process in which they are jointly involved. Both students and teachers wish for different teaching, although their attitudes towards changes of separate elements are not identical.

Awareness of the need to introduce changes into the teaching process and a positive attitude toward the shift are the good basis for educational changes. This is the beginning of a meaningful and concept-based change.

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NASTAVA KAO (NE)DVOSMJERAN PROCES

Ovaj članak pokušava odgovoriti na pitanje unosimo li promjene u školu, u nastavu. Istraživanje je provedeno na uzorku od 234 učenika i 55 učitelja u osnovnim i srednjim školama. Istraživanje pokazuje prenaglašenu ulogu metode usmenoga predavanja (54,6% učenika srednje škole, 75% osnovne škole i 83,9% srednjoškolskih učitelja/učiteljiica). Skupni i suradnički oblici rada zanemareni su. U četvrtome razredu osnovne škole koristi se 44,4% nastavnog vremena, postotak korištenja u srednjoj školi je 17,7%, a taj se oblik uopće ne koristi u osmome razredu osnovne škole. Nastava u našim školama podržava ulogu učenika kao pasivnog slušatelja te potiče bilježenje. Prisutan je jednostavan obrazac: učitelj/učiteljica objašnjava te postavlja pitanja, učenici odgovaraju kako bi ispunili zahtjeve kurikuluma (programa). Sve aktivnosti potiče učitelj/učiteljica. Takva nastava naglašava predavačev monolog, nestrukturirani rad na odgovoru učenika, ne potiče inicijativnosti učenika i suradničko učenje.

UDK 37.013

Marija Bratanić
University of Zagreb
Teacher training school in Zagreb

PARADOXES IN TEACHING AND LEARNING SYNTHESIS OF THEORETICAL KNOWLEDGE, PRACTICAL EXPERIENCE AND PERSONAL REFLECTION

Traditional pedagogy has considered education as the process of socialization and the transmission of social heritage left by the previous generations to the younger ones. These educational goals have enormous importance. But the essence of education is to help each individual to become a unique person, to draw out what is hidden within. Education as a process of personality development is "a bridge between potentiality and the actuality". A perennial paradox exists between socialization and personalization. The fear of surviving, as well as many political and ideological pressures, has not let education realize its essential function entirely. Therefore, what is called 'education' has often turned into its opposite. This paradox has not been solved up to now. Recently, the holistic approach has opened a completely new view to reality. From this point of view, education is observed as the interaction and communication between two or among more persons in a human relationship. In the specific space of a human relationship, interaction and communication could come under the impact of conscious as well as unconscious influences. If the unconscious and unintentional influences or activities have greater power than the conscious and intentional ones in education, the possibility of conflict, contradiction or confusion is real, irrespective of our awareness of it. But as we become more aware, we better solve the paradoxes. I have tried to elaborate several paradoxes connected with the human relationship, communication, interaction, as well as with some ordinary truths about teaching and learning.

Introduction

The ripeness that comes with age and great life experience allow me to make syntheses. A good part of my professional life I have dedicated to 'the mystery' of education. Mystery is something "hidden or inexplicable" or "something that cannot be or has not been explained". Could we link these explications with education? Without doubt we could, but not entirely. We should bear in mind that in this case the word "mystery" expresses my personal experience of education and it has more connotative than denotative meaning. Most of all, I have made efforts to build a pedagogical course in teacher education based on *Micropedagogy* as a new branch of *Pedagogy*.

The human relationship as a *microcosm* is the focus of *Micropedagogy* because human relations are the real foundation of education in the family, school and no matter where. I have researched education mostly on a micropedagogical level in connection with human relations, with interaction and communication as the basic processes in teaching and learning, as well as in education in general. Education, as we know, could be understood and analyzed from many more aspects and on different levels. Traditional pedagogy has considered education mainly as a process of transmitting experiences, knowledge, values, etc., from the older generation to the younger one in a particular society. In that case, attention is paid to generations and society.

Education, from a more psychological aspect, could be observed as the process of personality development. From this aspect, education is defined as primarily conscious and intentional influences and organized learning. I completely accept this definition. But, we should keep in mind that education occurs not in a vacuum but in a

human relationship where unconscious influences exist besides conscious ones, unintentional ones as well as intentional influences. In this regard, education is understood as mutual and reciprocal personal influences through activity *here* and *now* in the interrelation between the person who educates and the other who is educated.

Researching education as an interactive-communicative process at a micropedagogical, i.e. practical, level, I have begun to discover the phenomenon which appears *here* and *now* in educational practice and everyday life. It has always confused me. The book *Paradox in Education* (Bratanic, 2002) is devoted to this phenomenon. What is paradox? "**Paradox** (n), Statement contrary to received opinion; seemingly absurd though perhaps really well-founded statement; self-contradictory, essentially absurd, statement; person, thing, conflicting with preconceived notions of what is reasonable or possible" (Oxford Dictionary, 1952). Or "**paradox** *noun:* **paradoxes,** a saying which seems to contradict itself but which may be true" (Hands, 1998). In these definitions the main stress is on the words contradictory and conflict. The basic principle of paradox that I have formulated in my book makes clear under which circumstances a paradox may occur in education. From my point of view, a paradox may happen at any time and wherever unconscious stimuli have a greater influence than conscious ones. In most cases, the situation seems conflicting and confusing for those who take part in educational activities.

The concept of paradox as such does not exist in traditional pedagogy based on the old mechanical paradigm. Besides, the dominant positivistic orientation of pedagogical research has put an emphasis on empirical facts rather than profound truths. P. J. Palmer has pointed out that "profound truth, rather than empirical fact, is the stuff of which paradoxes are made" (Palmer, 1998, p. 63). There is good reason for the concept of paradox to have appeared with the new holistic paradigm which aspires to wholeness in all sciences as well as in pedagogy. I would like to describe some paradoxes in the form of syntheses of theoretical knowledge, practical experiences and personal reflections. I agree with P. J. Palmer that "the principle of paradox can help illuminate the selfhood of any teacher and the construction of any teaching and learning space" (Palmer, 1998, p. 77). Reading his book we may discover something about the sources of paradoxes in teaching that have authenticity for each of us.

Paradoxes connected with human relationship

Human relationship is a complex, dynamic and energetic space between two or among more persons. Since it is the most important factor among many to influence personal growth and social development, it is also an important factor in teaching and learning. "The powerful relationship between teacher and learner is central to the teaching process (Delors, 1996, p. 145). The essential characteristics of each interpersonal relationship are: interaction, reciprocity, circular stimulating and the agency of unconsciousness (Bratanić, 1993). But, the relationship between teacher and student, as well as any other educational relationship, has its specifics.

As this is a matter of persons who are on different levels of ages, maturity, knowledge, experience, etc., there are difficulties in establishing reciprocity: interchanging the positions of subject and object in the relationship, confrontation of opinions and effectuation of dialogue. The aspiration for equality, cooperation, and dialogue between such unequal persons could be very paradoxical. This is a profound truth. But there is another profound truth that teaching and learning, as a unique educational process, are primarily based on equal dignity, dialogue, and cooperation. We, as teachers and educators at the same time, must resolve this paradox, helping our

students to resolve it, too. It is important in higher education in general, but I would particularly stress the importance of training students as future teachers to become aware of this paradox.

Another paradox is linked with the professional and personal elements in the relationship. In a way, the educational relationship is a professional one, but, first of all, its success depends on personal elements such as affection, feelings, attitudes, thoughts, needs, interests, etc. As a professional relationship it should be more objective and rational, but in essence it is very subjective and irrational. The teacher and the student as human beings involve themselves in human relations as a whole, not in separate parts of their personality. Unless we respect the wholeness of the teacher's and student's personality as a profound truth, the paradox could disrupt the quality of the human relationship and the successfulness of all our attempts. The professionalism of the teacher includes competence in the subject taught as well as competence in teaching, but we should also be conscious that *we teach who we are* (Palmer).

Paradoxes connected with interaction and communication

Interaction is that invisible but important component of mutual and reciprocal influence in every human relation based upon thoughts, feelings, attitudes, needs, will, etc. Interactions make up those invisible threads of which the communicative network is knit. Education as an interactive process is affected not only by rational and conscious influences, but even more by irrational and unconscious ones. Paradoxes occur when unconscious influences are dominant. Communication is interaction through signs and symbols. It is verbal and nonverbal activity in the exchange of thoughts, ideas, feelings, attitudes, etc. Silence can also be a specific kind of communication.

"Just as the mode of the rational mind is words, the mode of the emotions is nonverbal. Indeed, when a person's words disagree with what is conveyed via his tone of voice, gesture, or other nonverbal channel, the emotional truth is in *how* he says something rather than in *what* he says" (Goleman, 1995, p. 97). Many paradoxes could occur subsequent to this truth. "I don't accept and understand teachers only because of the words they pronounce, but because of the feelings which emanate from them. The contents of the subject taught are inseparable from the teacher and they are strongly connected with his personality" (Student, second year of study in teacher education).

Communication as the foundation of all interpersonal relationships is much more than the exchange of words. One person brings to the communication much more than just the content of the message: he or she brings the whole of himself or herself. Communication requires a higher degree of awareness than we ordinarily possess. If the degree of awareness is lower, then observing and resolving paradoxes is lower, too. But traditional pedagogy did not deal with paradox or communication. The quality of interpersonal communication is the key to successful teaching and learning at every level of schooling.

Human communication has two inseparable levels: the first is connected with the relation between persons, and the second is connected with the contents. The first level is more connected with nonverbal communication. Trust and co-operation are the main conditions for effective and efficient communication. A paradox connected with this level could occur when an unconscious process like a projection is interpolated. For example, the teacher could experience the student as a person who was not trustworthy. But in fact he projects his own unconscious mistrust into his student who needs to experience his teacher as trustworthy, and vice versa. In this case, the paradox will be resolved if the teacher becomes more aware of his selfhood.

In connection with the second level, especially in a pedagogical sense, the paradox could occur because official teaching contents are not in coordination with the students' personal experiences. So seldom, as far as I know, do we treat students' experiences as sources of pedagogical knowledge. On the level of contents, effectiveness and efficiency are realized when the receiver interprets the sender's message the way the sender intended. Further, on this level, it is also important that congruence exists between what the teacher says, what he does, and what he is. "One student I heard about said she could not describe her good teachers because they differed so greatly, one from another. But she could describe her bad teachers because they were all the same: 'Their words float somewhere in front of their faces, like the balloon speech in cartoons'. /…/ Bad teachers distance themselves from the subject they are teaching – and in the process, from their students. Good teachers join self and subject and students in the fabric of life" (Palmer, 1998, p. 11).

Paradox of communication as specific 'breathing'

Biological breathing as a form of paradox includes inhaling and exhaling. From my point of view, interpersonal communication among people, especially among teachers and their students, is a specific mode of 'sociological breathing', metaphorically speaking. In the classroom the teacher and students should communicate by a system of 'inhaling' and 'exhaling'. If the teacher allows himself to speak for most of the time during the teaching without mutual and deep communication with his students he cannot create a favourable atmosphere in teaching. "Learning does not happen when students are unable to express their ideas, emotions, confusions, ignorance, and prejudices. In fact, only when people can speak their minds does education have a chance to happen" (Palmer, 1998, p. 75).

Paradox can occur because the students are used to a traditional method of teaching. Some specific paradoxes may have wider implications on society, as one of my students has commented. "For me", he said, "stressful and tiring courses are those in which the contents are just lectured without thinking of the methods how to do it, or, what is more important, who they are lectured to. This seems to me as a paradox of our educational system, which, however, has wider implications, because it is transmitted imperceptibly to other spheres of social life, so becoming a serious danger for all interpersonal relationships" (Student, second year of study in teacher education).

Some ordinary truths as paradoxes

P. J. Palmer impressed me with some ordinary truths about teaching as paradoxes. These truths would be important for those who have a similar experience and become aware of paradoxes. In the past few years, at the beginning of the academic year, I have felt more difficulties than earlier. This has been very strange for me. I have done my best to improve myself and my work. I have participated in numerous workshops, especially workshops dedicated to experiential learning which have been very useful to me.

Every academic year I improve my teaching step by step by developing the curriculum and attempting to synchronize the contents and methods, and harmonizing my relationship with the students. At the end of the academic year I experience a sort of blessing. The students' achievements are the reward for my efforts. I would like to continue working with the same generation of students, but at the beginning of the new academic year another generation awaits me. Why am I feeling so awful, so worried, so anxious? I positively know that this is something paradoxical.

It has taken time to understand that this was a question of discrepancies between my development level and that of my students. The more I developed myself the more I moved away from them. I had to find a way to bring my students to the level which would satisfy me. I recognize almost the same paradox in Palmer's thought, expressed more gently as follows: "The knowledge I have gained from thirty years of teaching goes hand in hand with my sense of being a rank amateur at the start of each new class" (Palmer, 1998, p. 63).

"At the beginning", one of my students said, "I was not satisfied, on the contrary, I was angry because I had to speak about myself and my thoughts directly to persons I did not know. I was used to the style of teaching where the professor explicates until the students sit and take notes. I was confused because I did not know what the professor expected and how we had to learn for the exam. After some time many things became clear to me…". This paradox cannot be resolved only at the level of a teacher-student relation outside the institution and the school system as a whole.

At an early stage of my pedagogical practice I had observed that teaching and learning denied students' feelings. I tried to illuminate the connection between head and heart, cognition and emotion, and the rational and irrational sphere of human personality. Palmer also stressed the link between intellect and feeling when he said: "Intellect works in concert with feeling, so if I hope to open my students' minds, I must open their emotions as well" (Palmer, 1998, p. 63). In the middle of the seventies I did my master's thesis on "Didactics synthesis of cognitive and emotional tasks in teaching". Further research shows that sympathy, positive feelings and attitudes play a significant role in teaching and learning. Without positive feelings it is not possible to develop empathy which is so important in the educational process.

Empathy as a human ability is connected with reciprocal understanding and successful communication. It is a complex ability with physiological, kinetic, psychical and moral aspects. The spiritual dimension of empathy should be taken into consideration. The empathy psychic aspect includes an affective component and a cognitive one. The affective elements are: sensitiveness to another person's feelings and identification with another person's status. The cognitive factors are: consideration of another person's point of view and the acceptance of another person's social role (Bratanić, 1993). Empathy is built on self-awareness. "The more open we are to our own emotions, the more skilled we will be in reading feelings.... Failure to register another's feelings is a major deficit in emotional intelligence, and a tragic failing in what it means to be human" (Goleman, 1995, 96).

The results of the study that D. Goleman mentions suggest that the roots of empathy can be traced in infancy. Empathy has considerable importance in interpersonal communication because it is connected with successful listening to and better understanding of the other person. This matters a great deal in recognizing and understanding paradoxes and in helping to discover their causes. As an ability which links the *ratio* and positive feelings, empathy can stimulate love as a spiritual power. With love we can 'move the mountain', figuratively speaking.

Palmer has mentioned some paradoxes connected with the old paradigm of education. "The world of education as we know it is filled with broken paradoxes – and with lifeless results: we separate head from heart. Result: minds that do not know how to feel and hearts that do not know how to think. We separate facts from feelings. Result: bloodless facts that make the world distant and remote and ignorant emotions that reduce truth to how one feels today. We separate theory from practice. Result: theories that have little to do with life and practice that is uninformed by understanding.

We separate teaching from learning. Result: teachers who talk but do not listen and students who listen but do not talk" (Palmer, 1998, p. 66). From the holistic point of view, education is observed as a whole, teaching and learning become a unique educational process, thinking and feeling are connected, as are theory and practice.

In all human activities, as well as in education, love is that power which interconnects and breathes life to all it touches. "What, then, is love?" Jampolsky has asked. His short definition of love is very simple: "The essence of our being is love" (Jampolsky, 1983, p. 52). Therefore, love is also the essence of education. "Communication with others is from love to love /…/. Yet when communication is based on love, it is deeply satisfying and healing" (Jampolsky, 1983, p. 53).

I would like to emphasize that love has a great role in resolving teaching and learning paradoxes. Without love, teaching and learning remain separate, as do teacher and student. What I want is more love in teaching and learning, i.e. more empathic understanding, more dialogue, more mutual confidence, care and respect. No matter "whether we are comfortable with paradoxes or not" we must become aware of them and become competent enough to resolve them.

Conclusion

Traditional pedagogy does not recognize paradox in education. The reason for this is the mode of thinking, based on a mechanical paradigm, which separates head from heart, facts from feelings, theory from practice, teaching from learning. From this point of view, paradox does not simply exist, but in fact is a real phenomenon. Paradox is a part of our everyday life. Living starts with birth and ends with death. The vital biological function is breathing which includes inhaling and exhaling as paradoxical actions. Interpersonal communication is a special mode of social breathing. Without "social breathing" we cannot be alive, we are socially lifeless. Love, as the essence of the human being, becomes the essence of education.

Love does not exist without inner connectedness among human beings. It seeks openness and mutual trust. The biggest obstacle to the appearance of love is fear. But fear is very frequent in teacher-student relations, and the presence of fear excludes love. Therefore, it is necessary to solve the problem of fear and love in order to resolve the problem of paradox in teaching and learning. But, paradox cannot be solved on a macro-level, so I focus my attention on a micro-level. My reflections, based on theoretical knowledge and practical experience, have been oriented to paradoxes connected primarily with interpersonal relationship, interaction, communication and some truths about teaching and learning. Becoming better aware of ourselves, we become more aware of the sources which produce paradoxes in everyday life and in teaching and learning as well.

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PARADOKSI U NASTAVI I UČENJU SINTEZA TEORIJSKOGA ZNANJA, PRAKTIČNOGA ISKUSTVA I OSOBNIH PROMIŠLJANJA

Tradicionalna pedagogija smatra obrazovanje procesom socijalizacije i prenošenjem društvenog naslijeđa s prijašnjih generacija na mlađe. Takvi obrazovni ciljevi imaju izrazitu važnost. No bit je obrazovanja pomoći svakom pojedincu da postane jedinstvena osoba, da izvuče ono skriveno van. Obrazovanje kao proces razvoja osobnosti je «most između mogućnosti i aktualnosti». Između socijalizacije i personalizacije postoji trajan paradoks. Strah od preživljavanja, kao i mnogi politički i ideološki pritisci, nisu dopustili obrazovanju da u potpunosti shvati svoju ključnu funkciju. Stoga ono što nazivamo «obrazovanjem» često se pretvaralo u svoju suprotnost. Taj paradoks do danas nije riješen. Odnedavno je holistički pristup otvorio sasvim nov pogled na stvarnost. S toga stajališta obrazovanje se promatra kao interakcija i komunikacija između dvije ili više osoba. U specifičnom prostoru ljudskog odnosa, interakcija i komunikacija mogu biti pod utjecajem svjesnih kao i nesvjesnih utjecaja. Ako nesvjesni i nenamjerni utjecaji i aktivnosti imaju veću moć od svjesnih i namjernih u obrazovanju, mogućnost sukoba, oprečnosti ili zbunjenosti stvarnija je, bez obzira na našu svijest o tome. No što svjesniji postajemo, to nam je lakše riješiti paradokse. Pokušala sam izložiti nekoliko paradoksa povezanih s ljudskim odnosom, komunikacijom, interakcijom, kao i s nekim jednostavnim istinama o nastavi i učenju.

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Sofija Vrcelj

Jasminka Zloković
University of Rijeka
Faculty of Philosophy Rijeka

TEACHERS AND PARENTS AS PROMOTERS OF LEARNING AND RESPONSIBLE BEHAVIOR IN CHILDREN

One of the principle roles of teachers and parents – within the educational and upbringing process – is to motivate children to learn and study, promote their personal and social development, as well as develop their individual and social responsibilities. In addition to the educational roles schools have, modern teachers must focus their attention even more to the educational practices that value each individual separately as well as integrate moral and social values into the curriculum. Since the parents play a major role in the child's life, they must concentrate even more on the problems of their children as well as their needs. This paper deals with the theoretic approaches to issues of developing responsibility, the parents' and teachers' roles in stimulating the child's potential for learning and developing responsibility, as well as some practical possibilities parents and teachers have at their disposal in order to raise and educate every child as a unique individual.

Children's social development and maturation reflect the constant changes that take place in a society – changes in the life style, values, interests – and in turn children often question the many quasi-cultural and material products of the society and especially the styles of discipline. Parents and teachers are "responsible" for the many things that are happening to children such as: learning, behavior, developing the child's potential and talents, personality and character development, self-awareness as well as awareness of the environment, accepting positive values, development of responsible behavior, etc. Considering the role parents play in their child's life (preparing their children for the life ahead of them, developing responsible and conscious individuals, helping them grow and develop to their fullest potential) in addition to teachers, parents must pay more attention to their children's problems and become more involved in their education.

Theoretic approaches to developing responsibility

According to humanist theories, developing responsibility is one of the essential dimensions of child development. A.H. Maslow's humanistic orientation, according to which individuals are responsible beings capable of making decisions and choosing among the various opportunities offered to them, is well known. People are not static beings, but rather active and dynamic individuals who constantly change and improve themselves (Fulgosi, 1990). It is because of this dynamic process that every individual is responsible for her/his personal growth and development and for fully actualizing himself/herself. According to the Oxford dictionary the term responsibility is the ability to act independently and make decisions (1998).

The psychosocial point of view (Zvonarević, 1980) places emphasis on subjectivity or the perception of responsibility that exists or does not exist within an individual. This cognition of responsibility may have a positive effect, namely the emotions prevailing in a person who has done well (a good deed or a well-done job) are

those of creative responsibility and success. The mood that accompanies this sensation is that of intellectual comfort and emotional relief. However, a responsible person may also experience negative feelings – guilty conscience, feelings of failure or inferiority – when failing to accomplish certain tasks or expectations. Regardless of this, the sense of responsibility is something that is ever present in someone's personality. It is not a dichtomic category.

From the point of view of developmental psychology (Hurlock, 1980) the sense of responsibility arises intuitively and very early in life, somewhere around the second year of life together with the feeling of possessiveness. A child who possesses a toy wants to keep it, therefore develops the sense of responsibility not to loose it, not to give it to someone else, etc. This feeling the child also projects to those he/she loves, whose presence he/she wants to keep – a mother, or a caretaker.

A crucial aspect of human development closely connected to the term responsibility is self-control. If a child does not learn to control her/his behavior – avoid things that must be avoided, wait for the things he/she cannot get immediately, adjust strategies that are not successful – she/he will constantly be under the influence of the environment. Self-control, as one dimension of personality, is the child's most impressive achievement (Bandura, 1986). Self-control indicates how much a child understands and is aware of the demands that the environment imposes on him/her and how he/she applies such behaviors in life (Vaughn, Krakow, 1984). The main characteristic of self-regulation is internal control. All throughout childhood, the child's behavior is controlled by rules or by the consequences of the parents' and other people's behavior. There are many theoretical models that explain the acceptance of internal control, namely they explain to what extent do the biological, cognitive or social aspects influence self-regulation.

There are three widespread types of parental disciplinary styles used to promote pro-social behavior and through it self-control in children (Hoffman, 1970). The disciplinary styles are: 1) use of authority, threat, physical punishment; 2) withdrawal, denial of love which includes verbal disapproval, ridicule or restraining from warmth; 3) induction, which includes reasoning with children in order to explain why a certain behavior is unacceptable and this often induces guilty feelings – showing the child how his bad behavior could have affected others, namely caused problems to others. Many parents use all three techniques in disciplining their children. There are various theoretical approaches to personality development (psychoanalytic, phenomenalistic, behavioral, cognitive, pessimistic theories, etc.) and responsibility development, of which we have mentioned only some.

Cultural responsibility towards children

The school encounters many problems children and young people are faced with, such as: aggressive behavior, neglect and abuse, alcohol and drug abuse by minors, and a series of other complex problems.

However, schools are more and more shifting towards the process of education and the development of children's cognitive dimensions. On the other hand, there is an increased tendency to transfer the family's role to raise and train children to educational institutions, namely the school. It is difficult to explain where the parent's responsibility towards their children "ends" and where the responsibility of the school starts or "ends".

Since it is obvious that the two key subjects that play the major role in the child's proper growth and development are the parents and the school, their interaction must be qualitative and not formal. Teachers can sometimes seem fed up and tired. They

give the impression that too much is expected of them. One of the central roles of teachers is to be skillful in interconnecting all the children's needs as well as helping families to accept their positive roles as parents. It is indisputable that the pedagogic reality progresses through complex and dynamic relationships that take place between the teacher and the student, the teacher and the parents, and the parents and the children. These relationships very often adopt different dimensions and intensities to which simple answers cannot be given. Let us just point at some of the very many delicate pedagogical, psychological, social, ethical as well as moral issues that need to be dealt responsibly and to which no "ephemeral" answers may be given. These are cases of children faced with serious health problems, (for example, issues concerning the schooling of HIV positive children) or children faced with all sorts of cultural and educational deprivations, as well as various existential problems. We also emphasize numerous cases of violence in families as well as in schools, of which many have ended tragically during the past few years.

It is justifiable to question who is responsible for the failure: the parents, the schools, the children, the society in general, or everyone evenhandedly. Although the major culprit has not been identified, it is no surprise that the tip of the balance is leaning "more" towards education.

In the broader sense, besides the various pedagogical, psychological, social, legal and other issues, it is also possible to discuss certain aspects of the culture of responsibility in terms of the level of general responsibility and enlightenment as well as to what degree have individuals and the society progressed with respect to child care. (Zloković, 2002)

Upbringing and education are long-term and complex processes. This complexity is visible if we look at some aspects of teaching and educating activities that take place in families and schools.

Parents and teachers play a central role in the life of a child. In the "immense"amount of educational tasks that are ascribed to parents and teachers – cognitive, affective, social, physical and moral tasks, helping children develop a sense of morality, a high level of conscience, civic virtue, teach them to value each individual as well as themselves, show compassion towards others, respect and help others, respect the human rights, in other words educate them in human values – the parents must also teach their children and the youth of their rights, obligations and responsibilities.

Although upbringing and education are interactive processes – under the term upbringing one implies the development of personality, namely the moral conscience, consciousness, the adoption of human values, the need for purpose in life, freedom, etc. (Mušanović, Rosić, 1997) – in this paper we will deal only with one aspect of the parents' and teachers' role in education: stimulating the child's development of responsibility towards himself/herself, towards other people and the environment he/she lives in.

Helping children develop responsible behavior is an important element of the risky-behavior preventive programs for children (www.images. Amazon.com/images/P/), which include violence and abuse prevention programs, prevention programs to help children avoid using drugs, alcohol and other substances.

Promoting learning and the development of responsibility in children by parents and teachers is one of the key socio-cognitive dimensions within the process of education.

Parents and teachers as promoters of responsible behavior in children

Schools promote development, but most frequently, they do so through aseptic curricula, neglecting the personal and social development of children. It has become almost a "rule" that so little time is devoted to the socio-emotional and psychological context when new educational reforms are being introduced. This specifically can affect the behavior of some children. Namely, according to R. White (Sprinthall, 1977) the key presumption of "affective education" is that there is an inborn need in every one of us to explore and cope with the world that surrounds us, which is the natural process of adaptation or adjustment to the environment. During this period, the classroom climate is important because it has the strongest influence on child development. In this respect, teachers are in a demanding position because they have to find the best strategies that will create highly motivated learning environments which will nurture responsible behavior. James Coleman concluded that pupils who see themselves as individuals unable to control their own destiny achieve lower academic achievements. (Sprinthall, 1977)

However, in such school (classroom) settings the question that arises is, What is more important: socialization or individuality?

Eccles's researches (1984) show that the teacher's behavior greatly affects the pupil's academic progress as well as her/his behavior, especially in the sixth and seventh grades. It is well known that during early adolescence academic excellence and motivation decline (Eccles, Midgley, Adler, 1984). The authors believe that the majority of schools are not prepared for the developmental needs of adolescents, namely the environment is not adequately adjusted to the adolescent's developmental stage and they call *it poor stage/environment fit*. There is a variety of reasons for this. First, the teachers place more emphasis on discipline and control when a young adolescent tries to become independent and self-assured. Second, with respect to this, teachers feel discouraged and inefficient especially with the "poorer" performing students who need more support and encouragement. Third, at this time the teachers try to group pupils according to their capacities, and in this manner the school encourages social compartmentalization among adolescents, and all of this during the time the adolescents are trying to establish their identity and self-conscience. Finally, the majority of teachers start to use higher standards in measuring student learning (their knowledge of subjects), which in "poorer" performing pupils results in the feeling of failure (looser) (Eccles, Midgley, 1990).

Responsibility is an important human trait. Its effects are visible in all human activities. In this paper we emphasize only some of the aspects of parents' and teachers' activities that promote learning and the development of responsibility in children, such as:

permit children to raise different questions and offer answers; discuss with children what they did at school, about their homework and what their tasks are; use various educating methods; present children with different types of tasks, suitable for their age, interest and abilities; encourage children to persist in their work and fulfil their obligations, as well as challenge and experience new activities; encourage and stimulate children to learn and explore new things; encourage independence in learning and studying; teach children to respect differences in people (intellectual, physical, emotional, health, gender, ethnic, nationality, racial, age, etc.); discuss events and future plans; encourage children to talk about their experiences, opinions and ideas; encourage children to participate in social activities; encourage children to cooperate with other people; encourage children to help other children especially if they are asked

to do so; parents and teachers must be consistent in their behavior towards children; respect the child's identity and personality; respect the child's needs, abilities and interests; have positive expectations from children; parents and teachers should be positive role models for children in developing the child's responsibilities towards families, other people, as well as the tasks they must finish off; develop the sense of reliability and that promises made to other individuals must be kept between a parent and a child; a teacher and a child, a child and his peers as well as promises made to other individuals.

We believe that *individual approach to every child; the respect of the child's individuality and differences; consistency in setting goals; the development and encouragement of positive interactions; positive orientation; establishing mutual trust and respect; developing the child's identity and self-respect and self-esteem* are some of the basic principles needed for achieving the goals set as priorities, namely stimulating children to learn and be responsible.

The most important tasks set before adults with respect to the education of children are: *develop the capacity to understand and tolerate differences (ethnic, racial, gender, health, physical, religious, etc.); teach them to respect others; develop the feeling of justice and truth-loving as well as the feeling of safety, patience, reliance, freedom of speech and opinion (critical thinking); teach them to show empathy, cooperation and to have the capacity to tolerate and cope with failures as well as solve conflicts; develop the capacity to engage in academically challenging pursuits; develop behavior that is both socialized and independent; develop the capacity and interest for achievement as well as many other cognitive, social, emotional, physical, moral and other tasks.*

During early childhood development, the family plays the central role in forming and shaping attitudes and beliefs children develop towards learning and new experiences, as well as teaching them responsibility. However, if the feeling of responsibility has not been sufficiently encouraged in family settings and later in schools, the possibility that it will develop later on in life is slim (Foster, Fay, 2001)

It is very important to teach children to assume responsibility for *themselves, their actions; for the decisions they make; for developing their potentials and achievements; for their behavior towards younger children, peers and adults; for cooperation with other people and for assuming responsibilities towards work, material and cultural values.*

Families and schools must find time to listen attentively to the children's feelings, thoughts, moods, plans, problems and needs.

In the long-run, these educational values are more valuable than fulfilling the cognitive tasks for learning (Die Hochere Schule, 7-8, 1993, 7, u: Herting, 1997).

Of course, one cannot diminish the role the society and the creators of educational policies play in achieving educational goals that are set before the parents and teachers. In particular this relates to: *respecting human rights; preventing violence and inappropriate child care; defining standpoints with respect to violence and other types of risky behaviors; offering various forms of protection and interaction with parents and children; strengthening the school's role as the promoter of growth and development; encouraging the democratic relationship with other people as well as the capacity to accept and tolerate differences – ethnic, racial, gender, physical, health, religious, etc.*

If the proclamations of the consumer society are at odds with the goals set by the school, then J. Weizenbaum's[4] statement in which he stresses that one of the consequences of this is the disconnectedness of the major subjects in the child's and young people's life is clear. Quote: "In front of your school doorsteps the world is destroying everything that you are so hardly trying to build." (Herting, 1997)

Conclusion

Reviewing current pedagogical issues is one of the key aspects of every civilized and humanly oriented society directed towards positive changes and development. Redefining the nature of parental responsibility but also that of the environment, as well as the schools, from which a developed childcare system can realistically be expected, seems indispensable. We believe that, in addition to motivating children to learn, the development of responsibility as an important trait of personality is of utmost importance for the proper functioning of every pore of our society. The term responsibility is viewed in terms of the positive cognitive, social and moral values.

Education is an active process that offers numerous forms and styles of developing the sense of responsibility towards ourselves and other people, of course respecting the fact that every child is a unique individual.

Challenges that are presented before the various contemporary concepts of education presuppose the inclusion of cognitive, emotional, social, moral, aesthetic and physical structures. Traditionally oriented teachers and standard curriculum prefer the mere transmission of knowledge and not – as humane education proposes – that pupils become autonomous individuals, mature, free and responsible people. The present perception of conventional core curriculum, capacity and skills are expanded to critical thinking, solving problems, technology literacy, development of managing abilities, positive standpoints, adjustability, responsibility and the capacity to cooperate with other people (Stoll, Fink, 2000).

Many studies and researches of elementary and high school curricula show that the essence of school work is unfortunately based on memorizing contents and facts and that only few inaugurate open and direct human communications between teachers and students. Namely, there are few situations that promote spontaneity, creativity, taking initiative and, in general, a humane relationship.

By reviewing this issue, many questions are raised concerning the motivation of children to learn and be responsible. For example, if we bear in mind the fact that in today's contemporary society parents are "parallel" teachers, i.e. families are "parallel" schools, then the question that arises is, Who is primarily responsible, the families or the schools?

Further on, the question raised is, Is it indispensable to include parents in educational reforms? These and similar questions, and especially those related to motivating children to learn as well as what are the responsibilities of parents (and schools) are the ones that we will have to pay more attention in the future.

[4] Professor of Computer Science at the Harvard University (Humane School, p. 190)

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UČITELJI I RODITELJI KAO PROMOTORI UČENJA I ODGOVORNOG PONAŠANJA KOD DJECE

Jedna od osnovnih uloga učitelja i roditelja – u obrazovnom i odgojnom procesu – jest motiviranje djece za stjecanje znanja i učenje, unapređivanje njihova osobnog i društvenog razvoja, kao i razvijanje osobnih i društvenih odgovornosti. Uz obrazovne uloge škola, moderni se učitelji moraju još više usredotočiti na obrazovne prakse koje svaku osobu vrednuju zasebno te moralne i društvene vrijednosti integrirati u program. Budući da roditelji imaju presudnu ulogu u životu djeteta, oni se moraju još više usredotočiti na probleme i potrebe djece. Ovaj se članak bavi teorijskim pristupima problemu razvijanja odgovornosti, ulogama roditelja i učitelja u poticanju djetetovih mogućnosti učenja i razvijanja odgovornosti te nekim praktičnim mogućnostima koje roditeljima i učiteljima stoje na raspolaganju kako bi odgojili i obrazovali svako dijete kao posebno biće.

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Vesnica Mlinarević
University Josip Juraj Strossmayer in Osijek
Teacher training school in Osijek

Edita Borić
University Josip Juraj Strossmayer in Osijek
Faculty of Philosopy Osijek

COOPERATION BETWEEN PARENTS AND SCHOOL

Contemporary school requires a concept of and a realization of high-quality cooperation with parents. Cooperation is a qualitative and continuous process which understands the need to form a close partnership between the two. The aim of the research presented in this paper is to establish the educational level and the level of competence of class teachers and subject teachers in primary education for cooperation with parents.
In this paper several teachers' judgements have been displayed: about their training for cooperation, school conditions for in-service training, time, forms and frequency of cooperation, successfulness of their relationship with parents and possibilities for an improvement in the partnership. The research was conducted with 29 class teachers and 28 subject teachers in three primary schools. The instrument applied is a questionnaire and an analysis of the primary pedagogical documentation. The results were qualitatively and quantitatively interpreted.
There are prerequisites for the improvement of conditions for the two-way communication with parents and for the making of forms of cooperation that will enable parents to participate more in decision-making and functioning of school.

Introduction

The democratic process in education asks for new forms of cooperation between school and parents which will be founded on the new relationship of mutual respect of partners and styles of behaviour (Maleš, 1999, p. 124).

Cooperation between parents and school is a pre-condition for pupils' better achievements and their positive picture of themselves. When well-balanced, joint action of parents and teachers, continuity of school and family orientation, gives valuable results in education and upbringing of pupils. Every school has in its curriculum a plan for cooperation with parents and other factors of local community. The law at the state level and programmes of cooperation at the local level provide every teacher with the opportunity to autonomously establish cooperation at class level through different group and individual forms of interaction with parents (Zakon o osnovnom školstvu N. N. No. 114/2001).

When teachers and parents get to know each other better, conditions are made for a better understanding of the child, its better development, its better behaviour, for a better communication, better learning style, and other. Knowing and understanding results in tolerance and mutual trust as well as in the readiness for negotiation and cooperation for the child's benefit. The research by Rokwell, Andre and Hawley (1995) points at a list of positive outcomes due to the cooperation between teachers and parents which was founded on the philosophy of improved interaction, child-adult and adult-adult. Stoll and Fink (1994) pointed at the need for partnership between parents and school not only because of the successfulness of their children but also because of their social welfare.

The school is expected to be democratic, to offer a positive atmosphere, preferable physical environment, work of high quality and conditions for good relations

between pupils, parents and teachers (Miljević et al., 2001). The school is more humane if pupils, parents and teachers feel equal, creative and responsible in their joint action, if they come to school with joy and still do complex and heavy tasks (Šoš, 1999, p. 601). Together with the parent, the teacher acts positively if she/he has the fundamental trust in her/himself, a positive picture of her/himself and high self-esteem, i.e. a positive attitude toward her/himself and towards parents' intentions, skills and personality (Milanović, 1997). Every expert brings into cooperation with parents their perception of efficiency, which is also reported in this research. Napan (1994, p. 9) indicated some personality traits, developed or learned skills necessary for a successful cooperation: kindness, empathy, open-mindedness, communi-cativeness, optimism, knowledge about one's own prejudices, active listening skills, and knowledge about how to provide help and support. In order for a high quality communication during partnership to be achieved, it is important to be emotionally literate, to show emotions in a sensible way and to recognize and understand emotions of others.

Every school is continuously dedicated to finding ways for cooperation of higher quality and of more efficiency, and to finding forms of working together in order for the partnership to result in the new quality (Rosić, 1998, p.116).

Empirical research

The research on cooperation with parents was conducted. First, data were collected about: education and in-service training of class teachers (who teach grades 1-4) and subject teachers (who teach grades 5-8); forms of cooperation between parents and school; and communication between parents and teachers and possibilities of its improvement. We started from the assumption that parents, during their children's primary school years, do not sufficiently cooperate with the school, and that the quality of this cooperation depends on the partnership of all participants in the educational process.

In total, 57 teachers were interviewed, 29 class teachers (cT) and 28 subject teachers (sT) in three primary schools in Osijek. The questionnaire consisted of 20 questions, 19 of which were yes/no questions and one open-ended question. The data about the sample features were collected (Table 1). The results of the questionnaire analysis are shown as frequencies and the percentage of frequencies, in table and graph form, and described.

Through the analysis of the primary pedagogical documentation (form register), the data about the pupils in the first and eight grades were collected, along with the data about the number of parents' meetings and the parent's attendance at those meetings, and about the number of individual meetings. Further, topics of parent's meetings during one school year were noted, both in lower (grades 1-4) and upper grades (grades 5-8).

The aim of the research is to establish the level of education and training of class and subject teachers in primary school for the cooperation with parents, all of which was directed towards improvement in communication, better understanding of pupils and their school achievements, and an increase in the quality of living in general.

Results of the research

Years of Service of Investigated Teachers

Table 1. Years of service of class and subject teachers

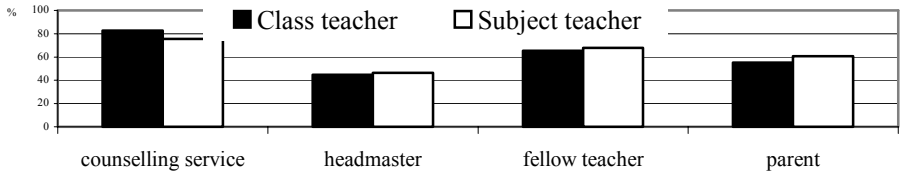
SAMPLE FEATURES		Lower grades (1-4)	Upper grades (5-8)
	Male		1
	Female	29	27
YEARS OF SERVICE	1 – 5	5	4
	5-10	8	5
	10-20	8	2
	20-30	3	12
	30-40	5	5

Most of the class teachers have 5 to 20 years of service, whereas most of the subject teachers have 20 to 30 years of service.

The analysis of teacher questionnaire in primary school

- For the first group of questions, related to education and further training of teachers, the following results were obtained:

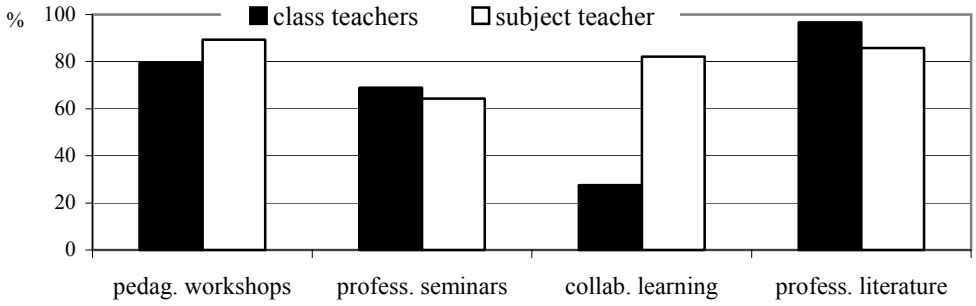
According to the questionnaire results 14.29% of class teachers and 27.59% of subject teachers believe that their college education provided them with enough knowledge and skills for cooperation with parents.



Graph 1. Help of different subjects for partnership improvement

For an improvement in the quality of cooperation with parents 82.76% of class teachers and 75.57% of subject teachers get help from a qualified expert (school counselling service). Both groups of teachers report that they get the least help from the school headmaster (44.82% of class teachers, 46.43% of subject teachers) (graph 1).

Graph 2. Methods for additional training

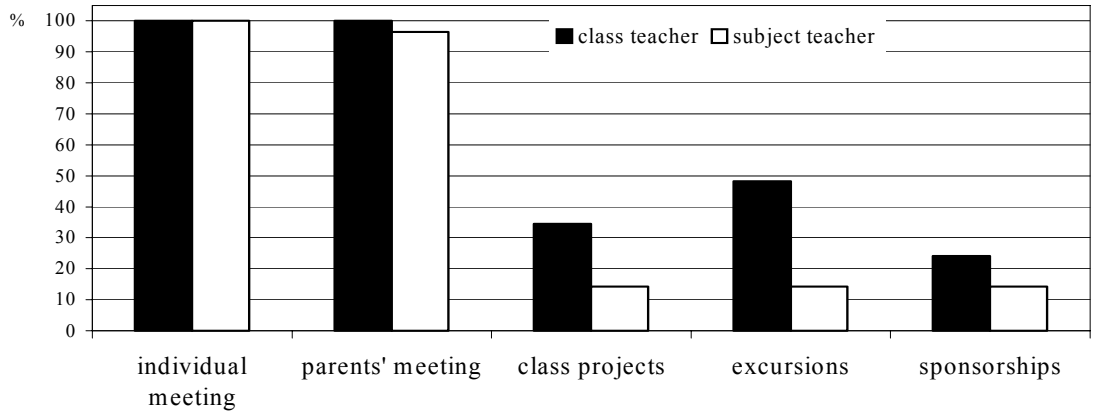


Class teachers find professional teacher's books most helpful for achieving successful cooperation (96.56%), and, as the least helpful, they indicate collaborative learning for parents organized in schools (27.59%). Subject teachers get most help from

the pedagogical workshops (89.29%), and the least help from professional seminars (64.29%) (graph 2).

- From the second group of questions, related to the communication of school with parents, the following results were obtained:

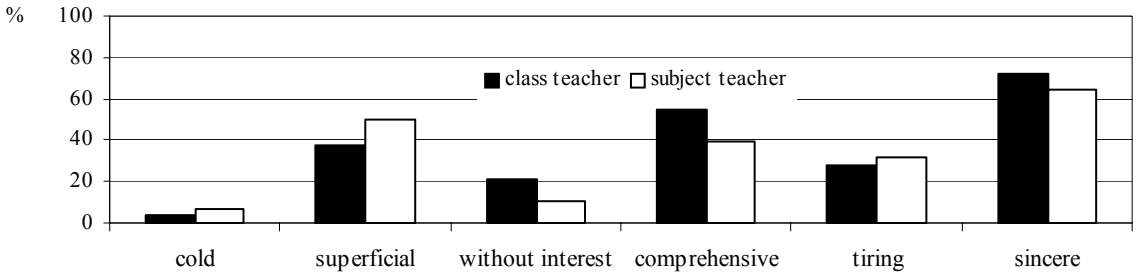
The communication with school is mostly maintained by mothers (89.66% in lower grades and 92.86% in upper grades). 86.21% of class teachers and 82.15% of subject teachers think that school does not give sufficient support for cooperation with parents. Parents do not spend much time in school.



Graph 3. Participation of parents in different forms of cooperation

Parents' attendance at parents' meetings is high both in lower (100%) and upper grades (96,43%). Parents' attendance at individual meetings is 100%. Parents of pupils in lower grades participate in other forms of cooperation more often (excursions 48.28%, classroom projects 34.49%, sponsorships 24.14%), whereas this participation is lower in upper grades (14.28% in the last three above mentioned forms of cooperation) (graph 3).

- The third group of questions is related to the communication between parents and teachers.



Graph 4. Characteristics of parent communication with school staff.

Parents mostly communicate with class teachers sincerely (72.42%) and in great detail (55.18%), and, in a small number of cases, this communication is cold (7.15%). With subject teachers, parents mostly communicate sincerely (64.29%) and superficially

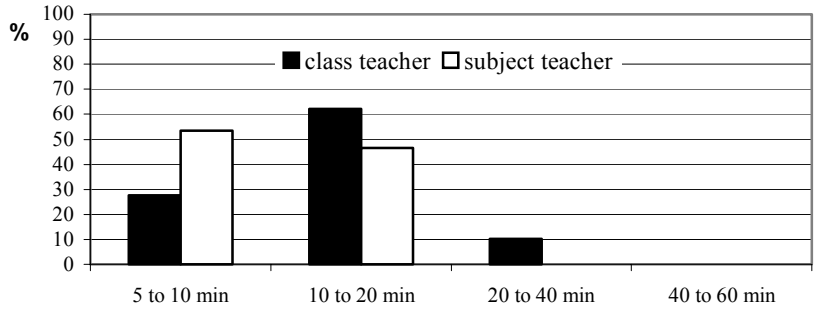
(50.00%), however, this communication is also the least characterized as cold (3.45%) (graph 4).

The relationship between parents and teachers in their school is described as collaborative by 92.86% of class teachers and 82.15% of subject teachers.

All parents of the pupils in lower grades accept help from the class teacher, whereas 67.86% of parents accept the teacher's help in upper grades.

- The fourth group of questions relates to the perception of personal relationship to parents, time spent in individual meetings, and cooperativeness.

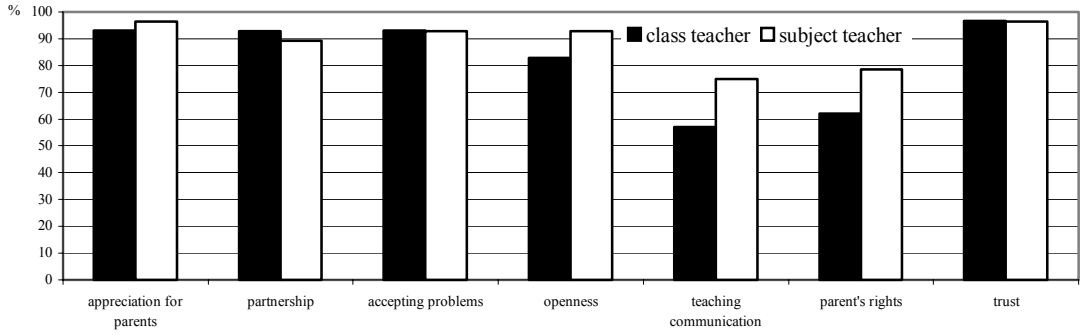
All class teachers successfully cooperate with parents, whereas 87.72% of subject teachers report the same.



Graph 5. Duration of individual meetings with parents

Individual meetings of class teachers with parents mostly last from 10 to 20 minutes (62.07%), and of subject teachers and parents from 5 to 10 minutes (53.58%). Everybody accepts parental help in raising and educating children (gfaph 5).

- The fifth group of questions relates to a possible improvement in the cooperation with parents.



Graph 6. Conditions for the stimulation of a positive communication with parents

In order to stimulate a positive communication with parents, 57,15% of class teachers and 75% of subject teachers finds training of parents in basic communicational skills important (graph 6). 96,56% of class teachers and 96,43% of subject teachers find earning parents' trust the most important, next is parents' appreciation (93,11% of class teachers and 96.43% of subject teachers), then giving importance to the problem of being

a parent (93.11% of class teachers and 92,86% of subject teachers). All teachers believe that their cooperation with parents can be made better. In Table 2 both class and subject teachers give their suggestions that should contribute to a more successful cooperation.

Table 2. Suggestions made by class and subject teachers for a more successful cooperation

CLASS TEACHERS IN PRIMARY SCHOOL	**SUBJECT TEACHERS IN PRIMARY SCHOOL**
EDUCATION OF PARENTS AND TEACHERS	EDUCATION OF PARENTS AND TEACHERS
- collaborative learning for parents - in school workshops for teachers and parents - further individual education - giving support and respect - educating parents	- inform parents about professional literature - lectures by experts in psychology and pedagogy - organization of lectures on child - development - training of parents and teachers on communication
COOPERATION	COOPERATION
- good problem analysis - joint agreement and appreciation of parents - sincere and warm approach - joint problem-solving - organizing different activities for parents - more frequent involvement of parents - informal forms of cooperation - socializing with everybody in school and on trips	- involvement of parents in programmes and projects - sincere and warm conversation - individual approach on a case-by-case basis - inviting parents to informal events/meetings - involvement of parents in school activities - parents are too busy - spirit of partnership and successful communication

The analysis of the basic pedagogical documentation

From the first to the eight grade in 69 classes in three primary schools, class and subject teachers had the same number of parents' meetings (144/142), four meetings during a school year on average. The number of individual meetings varies from zero to 15, with an average of eight meetings in the first and four meetings in the eight grades.

Table 3. Topics of parents' meetings in class and subject teaching

CLASS TEACHING	SUBJECT TEACHING
INFORMATION ABOUT SCHOOL ACTIVITIES	INFORMATION ABOUT SCHOOL ACTIVITIES
Curriculum, School's calendar Book of House Rules Parent and school association (parents' board) Book of regulations on assessment and evaluation Excursion programme Field trip	Curriculum School's calendar Textbooks Book of regulations on assessment and evaluation **Book of regulations on pedagogical measures** Prerequisites for high-school enrolment

Extra-curricular and out-of-school activities Cultural and public activities of school	Book of regulations on excursions, programme Book of regulations on makeup exams
LECTURES (pedagogical, psychological, sociological)	LECTURES (pedagogical, psychological, sociological)
Family law **Development of the picture of yourself** My child and its working habits Learning, styles of learning **Programme for violence prevention in schools** Behaviour disorders	Family law Violence in schools Prevention of addiction in primary schools Students' class load Learning and behaviour Unacceptable behaviour Vocational guidance Learning pro-social behaviour Farewell to arms (by an expert from the Ministry of Internal Affairs)
PUPILS' ACHIEVEMENT	**STUDENTS' ACHIEVEMENT**
Pupils' achievement	Analysis of self-reflection on students' achievement Students' achievement Analysis of class achievement Learning and behaviour
COOPERATION	COOPERATION
Planet Earth Day Humanitarian work (old people's and children's home) Workshops on creativity Excursion Parents attending a lesson Informal meetings (sports, barbecue...)	End-of-school-year festivities Workshops on creativity

The most frequent form of cooperation with parents are parents' meetings with the average of four meetings a year, the contents of which is informative and educational. Further, they are related to pupils'/students' achievement and to a joint agreement on cooperation improvement. This happens more often in lower grades. In upper grades, topics on informing, educating, and achievement of students are more frequent.

Conclusion

A prerequisite for the successful cooperation with parents is a teacher who acts professionally, an expert who is trained and ready for this kind of partnership. The results of the research point at a low level of education and training for cooperation of class and subject teachers. They reveal a need for a continuous professional development of teachers, which will enable them to take new roles in this partnership at all levels and in different forms, especially in collaborative learning (which is implemented the least). The results correspond with the results of the research by Maleš (1998), Rosić (1998),Vučak (2000), Stool and Fink (2000).

In most cases it is the mother who maintains cooperation with the school staff, and, in general, parents spend little time in school. Similar results were given by Rosić (1998); Maleš and Mijatović (1999, following the research by Estimates (1995) Penn. State Univ. Press: Time for Life). Parents' interest for cooperation is small, mostly directed towards students' achievements. Hentig (1993) states: "School has to make an effort to persuade parents into its pedagogical mind". This research confirmed traditional forms of cooperation, which corresponds to the research by Rosić (1998). Teachers

report to spending enough time speaking to parents individually. It is a good sign that parents have trust in teachers, and that they accept help offered in the spirit of collaboration and friendship. The results correspond, also, to the desirable structure of communication (Miljević-Riđitski et al. 2001). When comparing the research so far, Vučak (2000), Stoll and Fink (2000), according to Sammons, Hillman, and Mortimore, give important factors of efficient cooperation with parents: primarily trust and communication, which corresponds to our research results. Cooperation with parents is achieved through trust, sincerity, interest in establishing a collaborative and friendly relationship, by accepting help from both sides, which is not the case right now according to the results obtained. All of this seems to suggest that partnerships are to be built carefully, slowly and with mutual respect, understanding and trust. Consequently, this will lead to the exercise of care important for the development of children.

Both family and school are dependent on each other in the process of their joint action for the child's full development. Pedagogical work with parents offers no "recipe"; it is not a routine but a very complex creative activity. It is to be developed, enriched and changed continuously for the child's development benefit and for the pleasure of all of those who come to school (pupils/students, parents and teachers). Cooperation of high quality is useful not only for all the participants in the educational process, but also for the society in general.

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SURADNJA RODITELJA I ŠKOLE

Suvremena škola zahtijeva koncept i realizaciju kvalitetne suradnje s roditeljima. Suradnja je kvalitativan i kontinuiran proces koji podrazumijeva sklapanje bliskog partnerstva između škole i roditelja. Cilj je istraživanja ustanoviti obrazovnu razinu i razinu kompetencije učitelja razredne i predmetne nastave u osnovnoškolskom obrazovanju za suradnju s roditeljima. U ovom članku prezentirano je nekoliko sudova učitelja: o njihovu obrazovanju za suradnju, o uvjetima u školi za obrazovanje uz rad, o vremenu, oblicima i učestalosti suradnje, uspješnosti odnosa s roditeljima i mogućnosti poboljšanja suradnje. Istraživanje je provedeno na skupinama koje je sačinjavalo 29 učitelja razredne nastave i 28 učitelja predmetne nastave u tri osnovne škole. Pritom je korišten upitnik i analiza osnovne pedagoške dokumentacije. Rezultati su kvalitativno i kvantitativno obrađeni. Postoje preduvjeti za poboljšanje uvjeta za dvosmjernu komunikaciju s roditeljima te za kreiranje oblika suradnje koji će roditeljima omogućiti da više sudjeluju u donošenju odluka i funkcioniranju škole.

UDK 37.017

Emerik Munjiza
University Josip Juraj Strossmayer in Osijek
Teacher Training College in Osijek

Blanka Skender
Primary school Ivan Filipović
Velika Kopanica

CONTEMPORARY TEACHING AND TEACHING VALUES

The research was aimed at finding out about examples, role models and ideals of young people from primary to university level. Further, it was aimed at finding out about values these people have and which field of human activity they come from. When teaching values, it is essential to determine whether education can influence the character development and formation of values as a both means and aim of education.

1. Theoretical framework

The idea of contemporary teaching can be analysed from different points of view. *Contemporary* usually refers to the present.

However, *contemporary* can be understood as progress, modernization, and requirements related to content, organization, techniques and technology.

The full meaning of the concept of contemporary teaching can also be viewed from the point of teaching values. We understand it as defined by the time, content, organization, technical progress and the need for character development.

This need can be historically observed and confirmed. Historically, it was interpreted by Komensky in 1871, Herbart, according to Pedagoška enciklopedija, 1989 (Encyclopaedia of Pedagogy, 1989), Filipović, 1870, Trstenjak in 1917, according to Franković in 1978, and Basariček in 1876.

Many contemporary authors share a similar attitude: Vukasović, 1977, Vujčić, 1981, and Bezić, 1996, Osnovi suvremene pedagogije, 1999 (The Basics of Contemporary Pedagogy, 1999).

Since we defined contemporary teaching from the values' perspective, a new question has been brought up about what these values really are.

There are different axial and philosophical theories of values: marxistic, existentialistic, nominalistic, phenomenological, pragmatical and utilitarian, hedonistic, humanistic, and religious.

Since there are different axial and philosophical orientations for defining the concept of values and their importance, there are also different standpoints about their systems and hierarchy: Maslov, Henz, Bezić, Vukasović, Scheler, and Crutchfield-Krech.

A thorough analysis of the systems mentioned points at many common features. Most systems distinguish between higher and lower values; many groups of values are repeated in the same or similar form by different authors.

Most authors talk, especially, about values in education systems, some literally (Bezić, Vukasović), some within a wider concept of ethical, social, and religious values.

When compared to other values, teaching values has the feature of educational influence.

Further, we wanted to find out about the examples, role models and ideals of young people and what values they possess which young people wish to follow.

Because of the limits put on the length of the paper, the theoretical part is given only in theses.

2. Methodology

2.1. Objectives and tasks

The research was aimed at finding out about examples, role models and ideals of young people from primary to university level. Further, it was aimed at finding out about values these people have and which field of human activity they come from.

When teaching values, it is essential to determine whether education can influence the character development and formation of values as a both means and aim of education.

2.2. Sample

The sample consists of primary school students (one village and one town school), secondary school students (a classical and a private grammar school), and university students (Teacher Training College and Faculty of Education).

Table 1. Subjects of the research.

Educational institution	*N*
1. Primary School *Ivan Filipović* V. Kopanica	113
2. Primary School *Ljudevit Gaj* Nova Gradiška	94
3. Classical Grammar School *Fra Marijan Lanosović* S. Brod	120
4. Private Grammar School *Gaudeamus* Osijek	43
5. Teacher Training College Slav. Brod and Osijek	53
6. Faculty of Education Osijek	46
Total	469

The research involves 7th and 8th grade students in primary schools, 1st, 2nd, 3 rd and 4th year students of secondary school, and 1st and 2nd year university students. The chronological range of subjects had a span of nine years.

Subsequently, the research is both transverse and longitudinal.

2.3. Instruments, questions and statistics

For the purpose of the research, a questionnaire was designed. The subjects were not offered values to be evaluated, but they had to choose those that their role models should possess. We thought that answers obtained in this way could be more sincere, and consequently, more reliable.

The data collected was processed in the following way: the frequencies were added, turned into percentages (because of the uneven number of subjects per group), and ranks were determined.

On the basis of percentages and ranks, we calculated the correlations of ranks and Pearson's correlation coefficient.

The significance of correlations was calculated for correlation of ranks and correlation of Pearson's coefficient.

The following research questions were to be answered:

1. Which field of human activity young people choose their role models from and is there a difference between choices of different groups?
2. Which dominant values do the role models possess and is there a difference between different subject groups?

3. Do the values appreciated have a more permanent or a temporary character?
4. Can contemporary teaching satisfy the needs of young people and foster values?

3. Research results and interpretation

3.1. Role models with respect to the field of human activity

The majority of the subjects choose role models from real life (420 subjects or 89,5%). 43 subjects (9,2%) have a role model from the field of literature of history. Only six subjects (1,3%) did not answer this question or reported that they did not have a role model.

Table 2. Role models of young people with respect to the field of human activity.

Field of human activity	*Primary school*	*Secondary school*	**University**	**Total**	*Rank order*
	f % r	*f % r*	*f % r*	*f % r*	
Family	*59 24,7 1*	*80 39,8 1*	*44 44 1*	*183 33,9 1*	*3*
Sports	*52 21,8 2*	*31 15.4 2*	*2 2 8*	*85 15,7 2*	*2*
Entertainment	*43 18,0 3*	*23 11,4 3*	*5 5 6*	*71 13,1 3*	*2*
School/friends	*32 13,4 4*	*15 7,5 6*	*11 11 3*	*58 10,7 4*	*1*
Science	*23 9,6 5*	*11 5,5 7*	*10 10 4*	*44 8,1 5*	*1*
Culture	*14 5,8 6*	*18 8,9 4*	*9 9 5*	*41 7,6 6,5*	*2*
Religion	*9 3,8 7*	*17 8,5 5*	*15 15 2*	*41 7,6 6,5*	*2*
Politics	*7 2,9 8*	*6 3,o 8*	*2 2 8,5*	*15 2,8 8*	*3*
Other			*2 2 8,5*	*2 0,5 9*	*3*
Total	*239 100*	*201 100*	*100 100*	***540 100***	

f - frequency % - percentage, r - range

This question was a type of a combination: along with eight fields offered there was room for the subjects to add other fields. Only two students used this opportunity.

The total number of frequencies is slightly higher than the number of subjects because some decided for role models coming from different fields.

In two fields there is an agreement of three groups. The family role models are ranked as first in each group, and all groups in the research rank role models from the field of politics as 8th.

In four fields, sports, entertainment, culture and religion, there is an agreement between two groups. All groups differ in the way they rank the role models form the fields of school/friends and science.

On the basis of ranks obtained, a correlation was found within and between school systems. The results are given in Table 3.

Table 3. Coefficient of rank correlation and its significance

Educational institution	Correlation coefficient	Stat. signif. 0,05 0,01
1. Primary school - secondary school	0, 45	NO NO
2. Primary school - university	-0, 62	YES NO
3. Secondary school - university	-0, 46	NO NO
4. Primary school: village - town	0, 70	YES NO

5. Secondary school: classical - private	0, 87	YES YES
6. Teacher Training College- Faculty of Education	0,79	YES YES

Border values of the ranking coefficient of correlation for N=8 at the level of significance 0,05 is 0,643, and for 0,01 it is 0,833. For N=9 it is 0,006 and 0,783 (Mužić, Table 1, p. 625).

The results point at a low significance of correlation between school systems when compared to that within school systems.

Between school systems the variables are not statistically significant, two of them having a negative sign.

The three variables within school systems are statistically significant and positive.

3.2. Young people and their value systems

Young people choose their role models because of the characteristics, qualities and values they possess and find desirable. In the questionnaire, the subjects had to report about the values desirable. The values chosen are shown in Table 4.

Table 4. Choice of the most important alues

VALUES	PRIMARY SCHOOL			SECONDARY SCHOOL			UNIVERSITY			TOTAL			AGREEMENT
	f	*%*	*r*	*f*	*%*	*r*	*f*	*%*	*r*	*f*	*%*	*r*	
1. Intelligence	**90**	**16**	**1**	**76**	**17**	**1**	**24**	**9**	**3**	**190**	**15**	**1**	**2**
2. Sincerity	**61**	**11**	**3**	**64**	**14**	**2**	**39**	**15**	**1**	**164**	**13**	**2**	**-**
3. Goodness	**72**	**13**	**2**	**46**	**10**	**3**	**12**	**4**	**8-11**	**130**	**10**	**3**	**-**
4. Honesty	**57**	**10**	**5**	**38**	**8**	**5**	**18**	**6**	**5**	**113**	**9**	**4**	**3**
5. Persistence	**16**	**3**	**9**	**39**	**8**	**4**	**31**	**12**	**2**	**86**	**7**	**5**	**-**
6. Helpfulness	**25**	**4**	**7**	**32**	**7**	**6**	**20**	**7**	**4**	**77**	**6**	**6**	**-**
7. Beauty	**61**	**11**	**4**	**2**	**0**	**23-29**	**0**	**0**	**23-30**	**63**	**5**	**7-8**	**2**
8. Sense of humour	**31**	**6**	**6**	**26**	**6**	**7-8**	**6**	**2**	**16-17**	**63**	**5**	**7-8**	**-**
9. Diligence	**11**	**2**	**13**	**26**	**6**	**7-8**	**16**	**6**	**6-7**	**53**	**4**	**9**	**-**
10. Courage	**14**	**2**	**11**	**24**	**5**	**9**	**10**	**4**	**13**	**48**	**4**	**10**	**-**
11. Stability	**12**	**2**	**12**	**13**	**3**	**10**	**11**	**4**	**12**	**36**	**3**	**11**	**2**
12. Ingenuity	**15**	**3**	**10**	**6**	**1**	**15-17**	**12**	**4**	**8-11**	**33**	**3**	**12**	**2**
13. Successfulness	**17**	**3**	**8**	**5**	**1**	**18**	**3**	**1**	**20**	**25**	**2**	**13**	**-**
14. Creativity	**10**	**2**	**14-15**	**4**	**1**	**19-21**	**6**	**2**	**16-17**	**20**	**2**	**14**	**-**
15. Patience	**0**	**0**	**26-30**	**3**	**1**	**22**	**16**	**6**	**6-7**	**19**	**1**	**15-16**	**-**
16.Tenderness	**7**	**1**	**19**	**0**	**0**	**26-30**	**12**	**4**	**8-11**	**19**	**1**	**15-16**	**-**
17. Righteousness	**6**	**1**	**20-21**	**6**	**1**	**15-17**	**4**	**1**	**19**	**16**	**1**	**17**	**-**
18. Culture	**8**	**1**	**17-18**	**6**	**1**	**15-17**	**0**	**0**	**23-30**	**14**	**1**	**18**	**-**

19. Love	***9***	***2***	***16***	***2***	***0***	***23-24***	***2***	***1***	***21***	***13***	***1***	***19***	***-***
20.Entertainment	***0***	***0***	***26-30***	***0***	***0***	***26-30***	***12***	***4***	***8-11***	***12***	***1***	***20-21***	***2***
21. Ssensibility	***4***	***1***	***23-24***	***8***	***2***	***13-14***	***0***	***0***	***23-30***	***12***	***1***	***20-21***	***2***
22. Religiosity	***0***	***0***	***26-30***	***10***	***2***	***11-12***	***1***	***0***	***22***	***11***	***1***	***22-23***	***-***
23. Determination	***3***	***0***	***25***	***8***	***2***	***13-14***	***0***	***0***	***23-30***	***11***	***1***	***22-23***	***2***
24. Self-confidence	***5***	***1***	***22***	***0***	***0***	***26-30***	***5***	***2***	***18***	***10***	***1***	***24-26***	***-***
25. Independency	***10***	***2***	***14-15***	***0***	***0***	***26-30***	***0***	***0***	***23-30***	***10***	***1***	***24-26***	***2***
26.Thoughtfulness	***6***	***1***	***20-21***	***4***	***1***	***19-21***	***0***	***0***	***23-30***	***10***	***1***	***24-26***	***2***
27. Understanding	***0***	***0***	***26-30***	***0***	***0***	***26-30***	***9***	***3***	***14***	***9***	***0***	***27-28***	***2***
28. Seriousness	***8***	***1***	***17-18***	***1***	***0***	***25***	***0***	***0***	***23-30***	***9***	***0***	***27-28***	***-***
29. Generosity	***4***	***1***	***23-24***	***4***	***1***	***19-21***	***0***	***0***	***23-30***	***8***	***0***	***29-30***	***2***
30. Professionalism	***0***	***0***	***26-30***	***0***	***0***	***26-30***	***8***	***3***	***15***	***8***	***0***	***29-30***	***2***
	562	***100***		***453***	***100***		***277***	***100***		***1292***	***100***		

f - frequency ***r - rank*** ***% - percentage***

The analysis of the questionnaire identified 85 different values. We separated 30 of the most dominant values in terms of frequency.

Besides intelligence, all other values belong to the category of values which can be found in the educational process.

There is a considerable difference between the groups in their choice of values. The only agreed value, put by each group at 4th place, is the value of honesty.

There is an agreement on 10 values between two groups of subjects. The groups disagree about all the other values.

The correspondence between value systems is analysed with the help of Pearson's coefficient. 30 values, i.e. their frequencies, were turned into percentages because of the uneven number of subjects in groups. Their significance was determined according to Mužić, Table F, border values of the Pearson's correlation coefficient. The results are presented in Table 5.

Table 5. Pearson's correlation coefficient for value systems and their significance.

Educational institution	r	Level 0,05	Significance 0,01
1. Primary school – Secondary school	0,79	YES	YES
2. Primary school - University	0,51	YES	YES
3. Secondary school - University	0,76	YES	YES
4. Primary school: village - town	0,93	YES	YES
5. Secondary school: classical - private	0,62	YES	YES
6. Teacher Training College – Faculty of Education	0,54	YES	YES

According to the N-2=28, the border values of significance at level 0,05 is 0,361, and at level 0,01 it is 0,463.

The closer the school systems, the better correlation between them. Within school systems the correlation is put in chronological order. The highest correlation exists between primary school systems, the lowest between colleges, although it is still statistically significant.

The results provide us with a basis for generalization of all the variables observed at levels 0,05 and 0,01.

3.3. Value system and its stability

Our research shows that values are relatively permanent. The same values are found in each group, from primary to university level. However, their significance, place or rank varies in different groups.

Similar results were obtained by other investigators, e.g. by Pavičević in 1968 (according to Zvonarević, 1976).

Further, this can be confirmed by a parallel analysis of our research and the research done by Vukasović in 1977. The temporal distance between the two studies is 25 years.

In his research, Vukasović offered his subjects 30 values to be evaluated with respect to their importance. In our research, the subjects reported themselves about the values they desire for their role models. It is interesting that the 23 values duplicate in both studies. However, they differ in rank so that the correlation coefficient is –0,86, and it is statistically significant at levels 0,05 and 0,01.

3.4. Contemporary teaching and values in education

Role models of young people are mostly real life persons. In the hierarchy, they come from the family, sports, entertainment, school/college, science, culture, religion and politics.

School is the place where these fields interact with education. Therefore, it is a very convenient and desirable place for the perception, formation and action within value systems. Teaching is the central and most important component of schooling, and it should not avoid its role and significance for teaching values. Teaching is not restricted to its educational purpose only.

Among 30 dominant values, intelligence is the only one at the rational (educational) level, all other values are at level of emotions and will, which puts them into the framework of teaching values.

Therefore, we believe that contemporary teaching must be recognized not only as teaching knowledge but also as teaching values - to be formed, fostered and kept.

Only as such, the teaching can be qualified as contemporary: advanced, modern, and desirable, serving the present and the future.

4. Conclusion

One of the most important components of teaching today is the teaching of values. We start from the assumption that teaching should also contribute to formation and acquisition of values.

There are different classifications and hierarchies of value systems depending on their axial and philosophical orientation. Still, most of them directly or indirectly recognize values of the educational process, which are to be acquired during schooling.

When compared with other values, values in education have the influence on the process of character development. They are both the aim and the means. All of the education leads towards them and is led by them.

Significant roles in values formation have examples, role models and ideals. An old and recognized truth is that examples speak louder than words.

Our research showed that young people have their role models. Only 1,3% of the subjects has no role models or they gave no answer to the question. 89,5% of those who answered it has a role model from the real life. With respect to the dominant field, their role models come from family, sports, entertainment, school/college, science, culture, religion, and politics.

Most of the fields have a direct link with school, or they are its integral parts. That gives the school and the teaching, as its central point, a highly important role in the area of education.

Young people choose their role models for their certain qualities and values. When giving the explanation for the importance of their role models, the young mentioned 85 different values. Most of the values come from the educational field and are desirable from a wider social standpoint.

Values are a relatively stable category. However, their rank can change. In our research, the differences in the ranking of values between the primary, secondary and university systems are bigger, than within systems. This thesis is confirmed by a comparative analysis with some earlier studies.

The research points at a very important role of the school and teaching in the formation of values. Therefore, we believe that the recognition of teaching values as an educational component of contemporary teaching is necessary.

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SUVREMENA NASTAVA I ODGOJNE VRIJEDNOSTI

Autori istražuju odnose suvremene nastave i njezine odgojne vrijednosti.Većina istraživača ukazuje na nužnu dimenziju nastave, njezinu odgojnu ulogu. Naše istraživanje potvrđuje tu tezu. Mladi za svoje uzore biraju osobe s poželjnim odgojnim vrijednostima. Od identificiranih 85 izdvojili smo 30 najdominantnijih. Sve su one iz odgojnog područja i društveno su poželjne. U tom procesu škola i nastava imaju nemimoilaznu ulogu jer se navedene vrijednosti u njoj ostvaruju i kao odgojni cilj i kao odgojno sredstvo.

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Neven Hrvatić
University in Zagreb
Faculty of Philosophy Zagreb

CONTEMPORARY TEACHING: INTERCULTURAL PARADIGMS

Contemporary intercultural teaching (upbringing and education), is the result of the need to arrange multicultural societies according to the principles of *cultural pluralism* (mutual understanding, tolerance and dialogue, experience and permeation of one's own and different cultural characteristics), *universalism* (common interests, convictions, and customs), and *social dialogue* (cultural particularity and common bonds).
The new determinant of all three segments of teaching (*teacher*, *student*, and *content*) will also depend on the intercultural approach that will, in the end, allow the students the right to diversity, contribute to the realization of equal opportunities, as well as prepare all students for mutual co-existence in a democratic society.
The results of the research (within the framework of the scientific research project "School curriculum and the characteristics of the Croatian national culture") have shown that the value attitudes of the polled subjects (students, teachers, parents) indicate various tendencies, in regards to the examined dimensions of culture according to Hofstede's model, and should, by all means, be taken into consideration at structuring of the national school curriculum, as well as in contemporary teaching.
The existence of social distance significantly points to the need for the establishment of an intercultural curriculum where the contemporary teaching will be in the function of cultural integration, against prejudice, stereotypes, and discrimination, and for pluralism and democracy.
School curriculum must be "liberated" of subjects and contents that unnecessarily burden the students, and include contents related to the upbringing for peace, democracy, as well as intercultural contents in the teaching material.

1 Prologue

If we examine the correlation between the constituent factors of teaching: the teacher (who instructs), the student (who is being instructed), and the content (the subject of a didactically shaped process), their significance for the contemporary school is apparent.
While analyzing the fundamental components of teaching: *the teacher*, *the student*, and *the content*, we can also not ignore the general factors that significantly influence the teaching process: the curricular structure, micro and macro organizational conditions, school atmosphere, or the multicultural environment[1] in which the teaching takes place.
Defining the roles of all three segments of teaching will also depend on the intercultural approach that will, in the end, allow the students the right to diversity, contribute to the realization of equal opportunities, as well as prepare all students for mutual co-existence in a democratic society.

[1] For the European educational context, particularly characteristic is the pluralism of the contribution of other cultures, lingual and ethno-cultural pluralism, regional pluralism…, as well as the changes in the attitude of the Council of Europe: from special education for the "culturally different" (experimental teaching for emigrants' children), to education for all with a "cultural addition" (Perotti, 1995.,29), which enables the discovery of diversity but also the development of the skills and abilities crucial for the relationship between different cultures

The idea of intercultural teaching (upbringing and education), is the result of the need to arrange multicultural societies according to the principles of *cultural pluralism* (mutual understanding, tolerance and dialogue, experience and permeation of one's own and different cultural characteristics), *universalism* (common interests, convictions, and customs), and *social dialogue* (cultural particularity and common bonds).
In this context, it is important to emphasize the relationship between formal and informal education, which is the subject of the conception of *the Commission of the European Union (White document)*, as well as of the conception of *the International Commission for Educational Development for the XXI century*. Lifelong learning is becoming a multidimensional process that is not limited to gaining knowledge and where the complimentariness of the educational environments is being strengthened (formal, informal, schools, colleges, and alternative types of learning), which presents a new challenge for teachers and students. In the correlation of the four pillars of knowledge: to learn to know, to learn to do, to learn to live together, to learn to be (Delors, 1998, 95-108), it is precisely the intercultural education (*to learn to be together*) that presents an unexcludable link that allows for a more efficient work on the transformation of conflicts (typical for the contemporary world) and the development of respect for other people, cultures, and values. Since the multicultural features of the European societies are characteristic for Croatia as well, intercultural education is an unexcludable factor in the process of mutual acquainting, understanding of different cultures, as well as in the restoration of positive relations.

2 Teaching contents: intercultural stipulation

If, for a moment, we exclude from the teaching structure the *contents*, set by the curriculum (teaching program), we may notice their intercultural determinedness. That is, the fundamental questions of "intercultural" [2] teaching are derived from the accepted relationship, the attitude towards a multicultural society. The conception of intercultural upbringing and education is formed within the dichotomic demands: education in the function of discovering and stimulating the development of an individual towards universal characteristics that will make him/her similar to others, or preferring the opposite process: upbringing and education in the direction of the inclusion in certain groups and communities with a special culture (or the process of ensuring the rights to existence and expression of own characteristics) (Perotti, 1995, 12).
The area of multiculturalism and intercultural education in Croatia in the past period was directed predominantly towards the external migration and the education of the children in emigration. The shift to and the establishment of an active attitude towards a multicultural environment and intercultural education in Croatia come from the need:

- for more humane democratic interpersonal relations and the realization of human rights;
- for the insurance and promotion of the rights of national minorities in Croatia, its multiculturalism and multiconfessionalism;
- for the insurance and promotion of the educational and cultural rights of the Croatian migrants abroad and emigrants;

[2] Putting some terms in quotation marks is used in the case of a possible difference between the customary terms and their colloquial meaning. The quotation marks, therefore, do not implicate a value judgement, they only serve to avoid terminological misunderstandings.

- for the transfer of knowledge and skills to citizens of different descents needed for the participation in a pluralistic democratic society.

The multicultural structure of the Croatian society itself points to the justification of the inauguration of intercultural teaching models, which presumes getting acquainted with the relevant factors: the characteristics of the *national culture* and *social distance*.

Namely, the Croatian (national) culture is often talked about in the classroom in a slightly outdated and inappropriate way: as a "superior" culture in the European context or as a less valuable culture in relation to other cultures. One of the possible approaches to research of cultural differences has been conducted in Croatia within the framework of the scientific research project, "School curriculum and the characteristics of the Croatian national culture" [3] , according to Hofstede's model.

Hofstede defines culture as the "*collectively programmed consciousness that distinguishes the members of one human group from another*", emphasizing that culture is not the property of an individual, but of a group, in this case the *nation*. The term "nation" signifies "country", "society", and thus, the inhabitants of one country, regardless of their different ethnic or religious background, may share the same characteristics of the "*national culture*."

Hofstede divides the characteristics of the "national culture" into four dimensions: hierarchical distance, individualism-collectivism, masculinity-femininity, and control over uncertainty (anxiety) [4]. The results of the research in Croatia (and abroad) have shown that of the old division of cultures and peoples to those prone to democracy and dedicated work as opposed to those prone to authoritarian regimes and speculative profit- almost nothing remains. There was no example in earlier research for applying Hofstede's model in the area of intercultural research as it was done in Croatia. In that context, taking the dimensions of the "national culture" as the basis for the creation of a normative pedagogical model (socio-cultural capital of the young generation) for intercultural upbringing and education in Croatia, is the next (possible) step. The results of the research have shown that the value attitudes of the polled subjects (students, teachers, parents) indicate various tendencies, in regards to the examined dimensions of culture, and should by all means be taken into consideration at structuring of the national school curriculum, as well as in contemporary teaching.

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[3] Scientific research project "School curriculum and the characteristics of the Croatian national culture" 1996-2001. (the research was conducted on a stratified sample of 3970 students from 41 high schools from all county centers, 2011 parents of the polled students, and 371 professors- conducted by prof.dr. Vlatko Previšić). In the part of the research that referred to "national culture", the questionnaire included 113 questions (Licert scale) where four dimensions of culture according to Hofstede's model were examined: hierarchical distance, individualism-collectivism, masculinity-femininity, and anxiety. (According to: Hofstede, G. (1994), *Viore dans un monde multicultural*, Les Éditions D' Organisation, Paris.)

[4] Hierarchical distance :presents the continuum between two extremes (national cultures are in between) and it indicates to what extent a society accepts the fact that the power in institutions and organizations is not equally distributed among individuals;
Individualism-collectivism: indicates to what extent a certain society is a loosely connected social network in which people should only take care of themselves and their immediate family or a tightly connected community in which the members of individual groups can easily be distinguished, with the expectation that they care for each other;
Masculinity-femininity: indicates to what extent the dominant values in a society lean towards assertiveness and gathering of material goods ("masculinity") or the care for people and quality of life ("femininity").
Anxiety (control over uncertainty): indicates to what extent a society (and individuals) feel threatened by unclear situations and how they try to avoid them by prescribing rules and regulations, believing in one absolute truth and refusing to tolerate deviance.

3 Teaching: student-teacher interaction

The role of the teacher in a multicultural environment has multiple meanings. The classical educational function (transfer and didactic shaping of information) has already experienced changes (accelerated progress of teaching techniques and technology) towards animation, commenting, organization of activities, aid…in the teaching process.

One of the functions of the student ⇔ teacher interaction (as well as the content of contemporary teaching) is directed towards getting acquainted with one's own culture and past, which can influence the development of group (national) pride, self-respect, and indirectly of motivation and better academic success (Glazer, 1997.) However, the attitude that other cultures can be understood and accepted only by casual familiarization with certain parts and manifestations, is simplified.

The results obtained and the research effects of the scientific research project "School curriculum and the characteristics of the Croatian national culture" in the part that relates to the existence of a *social distance* from national and ethnic groups, may also help in defining the educational policy of the Republic of Croatia. Direct application in the teaching practice is possible from the point of view of disburdening of unnecessary contents, introduction of innovative programs, improvement of the quality of textbooks and other teaching materials, and overall more contemporary pedagogical communication between students, in the context of intercultural relations.

The social distance in the research was measured by Bogardus scale/seven degrees of intensity: five degrees of closeness (attraction) and two degrees of distance (rejection). If we make a certain rank-scale of the first five places (attraction: entering marriage), Croatians occupy the first place, Americans the second, then Italians, Germans, and Slovenians. The results lead to the conclusion that the subjects see themselves primarily surrounded by these nations and exhibit a more prominent social closeness to them. The data that relates to exclusion from Croatia indicates that "the most distant" are: Serbs, Montenegrins, Roma, and *Bošnjaci* (Muslims) (*table* 1).

TABLE 1.: SOCIAL DISTANCE FROM NATIONAL AND ETHNIC GROUPS

STUDENTS N=3970

NATIONAL AND ETHNIC GROUPS	Close kinship through marriage	To be your friend	To be your neighbor	To be a student in your class	To be a citizen of Republic of Croatia	To be only a visitor of Republic of Croatia	To be excluded from Croatia
1. Albanians	10,2	54,8	47,9	52,1	50,2	36,1	11,2
2. Americans	62,8	80,7	68,1	65,2	61,5	27,3	2,7
3. Bošnjaci (Mus.)	10,8	47,7	42,0	4,7	41,6	35,8	20,3
4. Montenegrins	10,3	39,2	35,3	37,5	34,9	36,9	24,1
5. Croatians	87,7	83,9	79,1	78,4	78,7	17,0	2,7
6. Hungarians	21,3	63,5	55,3	52,0	48,4	33,6	5,7
7. Germans	48,6	76,1	65,8	61,2	56,1	30,2	3,9
8. Roma	9,1	40,1	33,4	37,3	38,0	36,2	22,0
9. Russians	16,2	50,0	42,9	43,2	39,3	38,1	15,0
10. Slovenians	32,4	66,2	58,0	54,3	50,0	31,5	8,3
11. Serbs	11,3	33,0	28,1	30,5	27,9	26,9	45,4
12. Italians	52,7	73,7	62,8	69,6	54,2	30,3	4,6
13. Jews	15,7	56,1	48,2	47,7	46,0	33,6	14,1

TABLE 2.: SOCIAL DISTANCE FROM NATIONAL AND ETHNIC GROUPS
PARENTS N=2011

NATIONAL AND ETHNIC GROUPS	Close kinship through marriage	To be your friend	To be your neighbor	To be an employee at your company	To be a citizen of Republic of Croatia	To be only a visitor of Republic of Croatia	To be excluded from Croatia
1. Albanians	8,0	36,2	30,5	29,3	44,2	24,3	8,0
2. Americans	29,4	61,2	45,0	51,9	46,7	9,5	1,0
3. Bošnjaci (Mus.)	9,0	34,8	30,0	29,2	38,3	23,7	11,8
4. Montenegrins	10,5	30,4	25,9	25,2	32,8	24,5	15,2
5. Croatians	74,6	68,9	61,6	59,7	60,3	0,7	0,2
6. Hungarians	19,7	51,3	44,0	37,3	44,4	13,7	1,6
7. Germans	29,9	60,5	46,6	49,2	46,5	10,9	1,0
8. Roma	7,0	25,9	19,9	20,1	35,5	22,8	15,5
9. Russians	10,1	29,7	24,2	24,4	30,7	26,4	13,7
10. Slovenians	21,4	42,7	36,9	36,3	38,8	21,0	5,5
11. Serbs	11,1	27,8	23,7	23,3	31,3	20,2	25,0
12. Italians	28,8	52,7	43,5	42,1	43,5	16,4	2,2
13. Jews	14,0	41,4	34,8	36,2	42,5	20,0	5,6

The subjects show relative social closeness to other national and ethnic groups: to Hungarians 63,5%, to Jewish people 56,1%, to Albanians 54,8% - *friendship,* in other words one cannot talk about "black and white" relationships, especially in regards to nations and ethnicities towards which non-acceptance was exhibited, but at the same time, the percentage of the responses that point to acceptance is not negligible.

Since the social distance from national and ethnic groups of the students and parents (*table* 2) is very similar, and it partially deviates from those of the teachers (*table* 3) (towards greater social closeness), we may assume that the influence of family upbringing is very important in forming attitudes in this area, and likewise, that the rooted points of view are difficult to change or shape more significantly as early as in the period of elementary school.

TABLE 3.: SOCIAL DISTANCE FROM NATIONAL AND ETHNIC GROUPS
TEACHERS N=371

NATIONAL AND ETHNIC GROUPS	**Close kinship through marriage**	**To be your friend**	**To be your neighbor**	**To be a teacher at your school**	**To be a citizen of Republic of Croatia**	**To be only a visitor of Republic of Croatia**	**To be excluded from Croatia**
1. Albanians	18,1	64,2	60,6	62,3	79,2	11,6	1,6
2. Americans	46,6	84,9	77,1	81,4	75,2	4,0	0
3. Bošnjaci (Mus.)	19,7	63,9	61,7	61,2	73,3	12,1	3,2
4. Montenegrins	23,7	58,8	56,6	58,0	66,8	18,6	2,7
5. Croatians	88,7	90,8	86,5	85,7	83,8	0	0
6. Hungarians	38,8	76,8	77,4	71,7	78,2	5,4	0
7. Germans	45,6	82,2	77,9	80,9	77,6	5,1	0,3
8. Roma	14,6	52,0	46,4	46,9	69,0	15,9	4,0
9. Russians	22,9	61,5	56,9	59,0	66,3	18,1	2,7
10. Slovenians	37,2	68,5	65,8	68,2	69,8	11,9	1,9
11. Serbs	25,1	55,3	54,4	53,9	66,0	15,6	9,4
12. Italians	46,6	78,4	74,7	74,9	75,5	7,0	0,8
13. Jews	31,0	72,5	68,2	72,5	77,6	7,0	1,3

The complete results of the scientific research project "School curriculum and the characteristics of the Croatian national culture" significantly points to the need for an establishment of an intercultural curriculum, [5] where contemporary teaching will be in the function of cultural integration, against prejudice, stereotypes, and discrimination, and for pluralism and democracy. In so conceptualized intercultural teaching the teacher assumes a new role as well, where he/she does not only possess a good knowledge of other cultures, acts as a "barrier" against forming stereotypes, one-sided views, and prejudices, but is also a co-operator, a creator of new attitudes towards real knowledge and successful intercultural relations (*scheme* 1).

SCHEME 1: FUNCTIONS OF THE TEACHER IN REGARDS TO CULTURAL ENVIRONMENT

CULTURAL ENVIRONMENT	**COURSES OF ACTION**	**TEACHER'S ROLE**
AUTONOMOUS CULTURE	TRANSFER OF NATIONAL STEREOTYPES	MEDIATOR
CULTURAL PLURALISM	ACCEPTING ELEMENTS OF OTHER CULTURES	MENTOR
MULTICULTURAL ENVIRONMENT	INTERCULTURAL TEACHING	MODERATOR

Emphasizing the importance of the content (intercultural) and the method of learning (in a multicultural group) is particularly important in order for the school to act as a catalyst in the process of *inculturation*, an addition to family upbringing and "education" (and not a source of opposition) and a crucial factor in the adaptation of the children and the young. The intercultural approach in a multicultural environment stipulates the discovery of similarities and differences- the relationship with, and not only teaching about diverse cultures. Besides getting accustomed to and experiencing different cultural characteristics, and besides education about human rights and democratic values, the intercultural approach also implicitly includes new methods in developing curriculum and teaching (cooperative learning).

4 Conclusion

The basic questions of intercultural upbringing and education come from an accepted relationship, attitude towards a multicultural society (contemporary form of teaching for life in democracy and pluralism). The conception of intercultural upbringing and education depends to a great extent on the teaching contents, models, strategies…, and according to cultural integration and implementation in the upbringing-educational practice.

Intercultural paradigms of contemporary teaching may be examined through the components:

[5] In this context the curriculum is defined as a group of planned and implicit terms of reference that direct the educational process, and are related to the tasks and contents that are consistently derived from the goal, and to organizational forms, work methods, and procedures of testing successful teaching processes. (According to: Tanner, L.N. , Tanner, D. (1982), *Curriculum History as Useable Knowledge*, Curriculum Inquiry, 12,4. and Kliebard, H.M. (1986), *The Struggle for the American Curriculum*, Pitman, New York.)

- Individuality– respect for the individual approach of every student, according to the development of self-realization as well as in relation to us/them (others);
- Cultural models – respect for the cultural milieu from which the student is coming (customs, tradition, rituals) and finding of common elements;
- Existence – getting acquainted with the fundamental material and spiritual values important to all people;
- Social structure - the social position within a society is stipulated by the development of certain social institutions: family, education, religion, political system…;
- Interdependence – development of self-confidence and self-respect depends on the individual and group affiliation and the ability of mutual co-existence;
- Communication – the process of successful transfer of messages directly depends on the knowledge of the language, symbols, signs, and the behavior of those to whom the message was directed;
- Exploitation– gathering of personal or group goods, presumes various types of exploitation as well as the existence of stereotypes and discrimination;
- Pluralism – the equality of individuals of different racial, ethnic, religious, and social characteristics allows integration as a social and cultural process.

Apart from the possible interventions in the media domain and shaping of a social atmosphere in which interethnic and interconfessional dialogue, cooperation, intercultural relations will be particularly valued- the primary tasks towards the full respect of human, national, and ethnic rights and the culture of peace, are assigned to school and contemporary teaching.

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SUVREMENA NASTAVA: INTERKULTURALNE PARADIGME

Suvremena interkulturalna nastava (odgoj i obrazovanje) rezultat je potrebe za uređenjem multikulturalnih društava prema principima kulturalnog pluralizma (međusobno razumijevanje, tolerancija i dijalog, iskustvo i prožimanje vlastitih i različitih kulturalnih osobina), univerzalizma (zajednički interesi, uvjerenja i običaji) i društvenog dijaloga (kulturalne pojedinačnosti i opće poveznice). Novo određenje sva tri segmenta nastave (učitelja, učenika i sadržaja) također će ovisiti o interkulturalnom pristupu koji će na kraju omogućiti učenicima pravo na različitost, pridonijeti ostvarivanju jednakih mogućnosti te učenike pripremiti na suživot u demokratskom društvu. Rezultati istraživanja (unutar okvira znanstvenog istraživačkog projekta Školski kurikulum i odlike hrvatske nacionalne kulture) pokazuju kako vrijednosna stajališta ispitanika (učenika, učitelja i roditelja) ukazuju na različite tendencije u odnosu na propitane dimenzije kulture prema Hofstedovom modelu te bi se svakako trebali uzeti u obzir pri strukturiranju nacionalnog školskog kurikuluma, kao i u suvremenoj nastavi. Postojanje društvene udaljenosti bitno ukazuje na potrebu utvrđivanja interkulturalnog kurikuluma u kojem će suvremena nastava biti u funkciji kulturalne integracije, protiv predrasuda, stereotipa i diskriminacije, a za pluralizam i demokraciju. Školski kurikulum mora biti »oslobođen« od predmeta i sadržaja koji nepotrebno opterećuju učenike, a uključiti sadržaje povezane s odgojem za mir, demokraciju kao i interkulturalne sadržaje u nastavnom materijalu.

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Edita Borić

Anđelka Peko
University Josip Juraj Strossmayer in Osijek
Faculty of Philosopy Osijek

PRECISE EVALUATION STANDARDS – CONDITIONS FOR SUCCESSFUL TEACHING

Current understanding of evaluation is based on comprehensively elaborated evaluation objectives and ways of its implementation – the process itself is equally valuable as its outcome.
To which extent the standards of evaluation are understood by students and teachers in the teaching process, in organization of which they both take part, is the subject of the research presented in this paper. The research included 205 students and 28 teachers, and it was aimed at finding out about: unambiguousness of educational aims set are unambiguous, adequacy of the standards set for all students, different evaluation techniques used, unambiguousness of the criteria set, frequency of testing students' knowledge, and students' involvement in evaluation.
The results of the research point at a disparity with regard to evaluation standards.

Introduction

Evaluation of knowledge in schools served traditionally as a means to determine the level of student's success in meeting the demands of the norm. Present-day understanding of the concept of evaluation is more dynamic, and it is based on comprehensibly elaborated objectives of evaluation and its implementation (Inovacije, 1989). The process is seen as equally valuable as its outcome. The influence of evaluation on education and its correspondence to educational aims were researched by Munby, Phillips, Collins (1989); Kulik, Kulik, Bangert-Dockrell, Gipps, Harlen and Nuttal (1993).

Testing and grading in the educational process involves observation, assessment and evaluation of student's progress in all activities, and they influence the final grade in each subject as well as the overall student's achievement.

Every grade, if inadequately applied, stimulates competitiveness instead of cooperation.

If it does not stimulate the student, the grade loses its primary function. A public debate conducted in Croatia about evaluation identified downsides of our grading system.

New guidelines in education require from the teacher to do some action research and to find alternative methods of assessment and evaluation of students' progress. The teacher's attention should be directed more to observation and assessment.

It is important for the teacher to cooperate closely with all parties involved in the educational process (parents, materials, members of local community).

Students need to have a full understanding of the standards required and the ways the achievement is to be evaluated. Moreover, it is desirable to teach students to self-assess and self-evaluate their work.

As a consequence, the grade will become the result of the three processes: students' self-assessment, teacher's assessment, and the dialogue between the two. The teacher should help students to determine the level of their achievement.

The topic of the research presented in this paper is the extent to which the standards of evaluation are understood by students and teachers in the teaching process in the organization of which they both take part.

It is essential to receive an objective insight into the teaching process and the evaluation standards. Rogers (1976) claims that recording the lessons (in our research we examined the understanding of evaluation standards) results in a more flexible view of the process we stimulate and create; therefore, the recordings could be used for a constructive change of behaviour.

Objectives, instruments and hypotheses of the research

By conducting this research we wanted to investigate the evaluation standards in the school today.

In order to get an insight into the evaluation standards applied, there existed the need to question students and teachers about:

- the unambiguousness of educational aims set;
- the adequacy of standards set for all students;
- the use of different evaluation techniques;
- the unambiguousness of criteria and the frequency of evaluation;
- the students' involvement in evaluation.

A parallel questionnaire was applied. Students and teachers responded to the same questions.

We started with the assumption that students and teachers take part in the same process, but that they have a different understanding of evaluation standards.

Sample

The sample consisted of 5th grade (53) and 8th grade students (51) from a village school and of 5th grade (56) and 8th grade students (45) from a town school, and of their teachers (16).

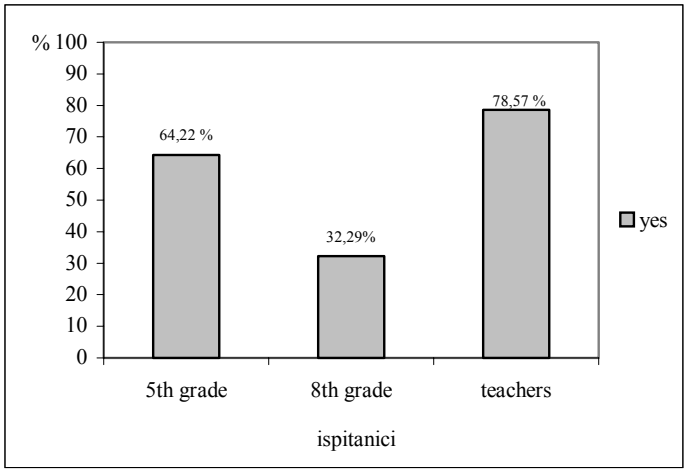
Along with the percentage, the distribution correlation (of the answers given by 5th and 8th graders and their teachers) was calculated by a chi square test.

Rezults and Discussion

- **Unambiguousness of educational aims**

To the question whether the educational aims set (what is going to be studied, understood, done during the year) can be achieved, 87% of 5th graders and 76,04% of 8th graders respond positively. The same opinion is shared by 85,71% of the teachers. The chi square calculated (distribution of students and teachers answers) is 0,5 and points at the agreement of the distributions observed.

84, 49% of 5th graders and 53,13% of 8th graders find the aims of each school subject precise. 92,86% of the teachers share the same belief (graph 1). The chi square calculated is 7,39, and it is statistically significant. The agreement between the students' and the teachers' answers is obvious.



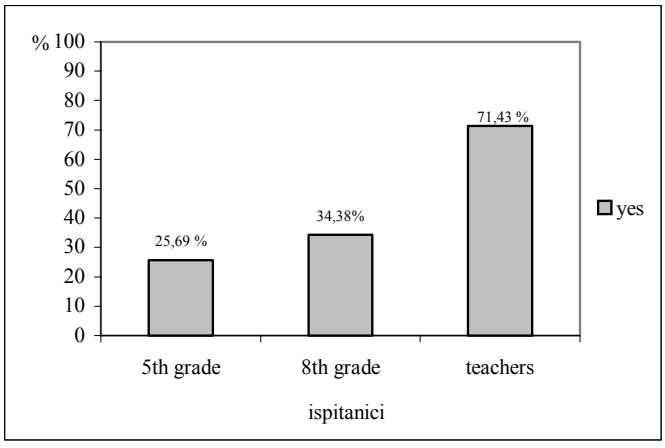
Graph 1. Aims the subjects believe they can achieve

86,24% of 5th graders, 68,78% of 8th graders, and 87,71% of the teachers believe that evaluation standards of students' achievements, learning and behaviour should be precise and unambiguous.

Thus, it is obvious that there is a higher correspondence between the answers given by the teachers and the 5th graders, rather than between the teachers and the 8th graders.

- **Adequacy of standards**

To the question whether all standards should be optimally achievable (e.g. in relation to environment protection and pollution), 75,25% of 5th graders, 65,63% of 8th graders and 89,29% of the teachers give a positive answer (graph 2). The agreement in their responses is evident (chi square is 0,002).



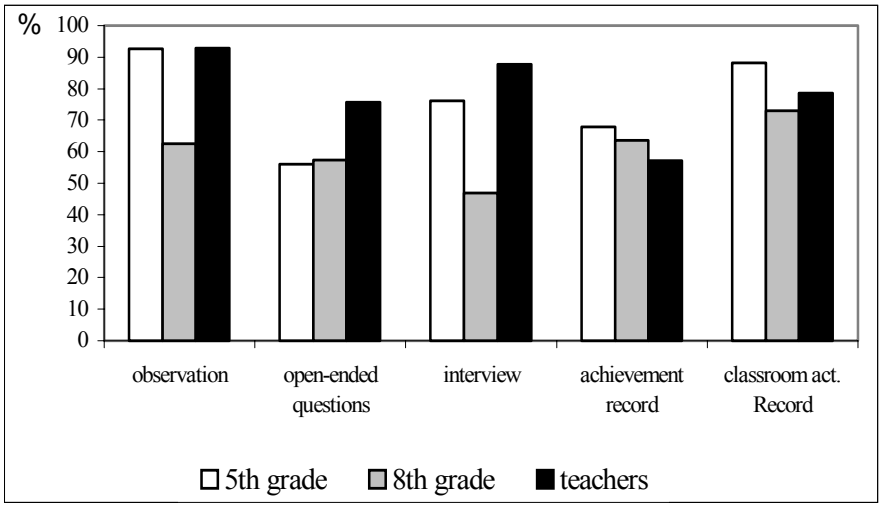
Graph 2. Level of achievement the subjects believe can be reached by a lower number of students

The level of achievement which should be reached by a smaller number of students is desirable (25,69% of 5th graders, 34,38% of 8th graders and 71,43% of the teachers).

There is a disagreement in the distribution of the answers given by the teachers and students.

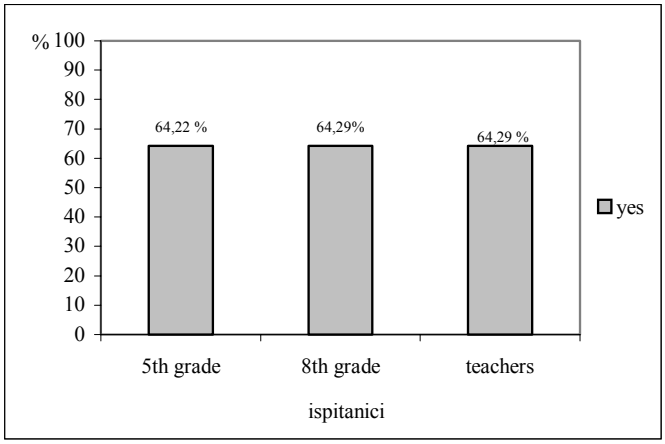
- **Application of different evaluation techniques**

During the school year a teacher mostly uses the following assessment techniques: observation, open-ended questions, interviews, achievement record, and classroom activities' record. According to the distribution of answers to the question about the variety of assessment techniques used, there is a difference between the answers given by the 5th and 8th grade students, and between the students and the teachers (graph 3).



Graph 3. Evaluation techniques used by teachers

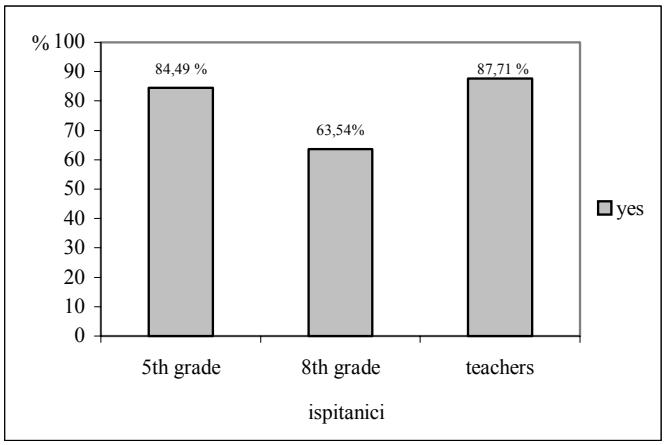
64,22% of 5th graders, 61,46% of 8th graders and 64,29% of the teachers report that self-assessment of students is possible (graph 4). The chi square of the distribution of the students' and teachers' responses is 1,69 and points at the agreement between these answers.



Graph 4. Options for class-load

- **Unambiguousness of criteria and frequency of evaluation**

To the question whether standards by which the teachers grade the students are precise, 83,49% of 5th graders, 63,54% of 8th graders, and 87,71% of the teachers respond affirmatively (graph 5).



Graph 5. Precise standards of evaluation by teachers

For grade *5* (the best grade) the students think they should know everything without the teacher's help, be able to explain everything, and study a lot.

This opinion is shared by 99,08% of 5th graders and 90,63% of 8th graders.

The teachers think that for a grade of *five,* students need to be able to do complex tasks independently, quickly and correctly, understand phenomena and processes prescribed by the programme, and apply the knowledge acquired in everyday situations.

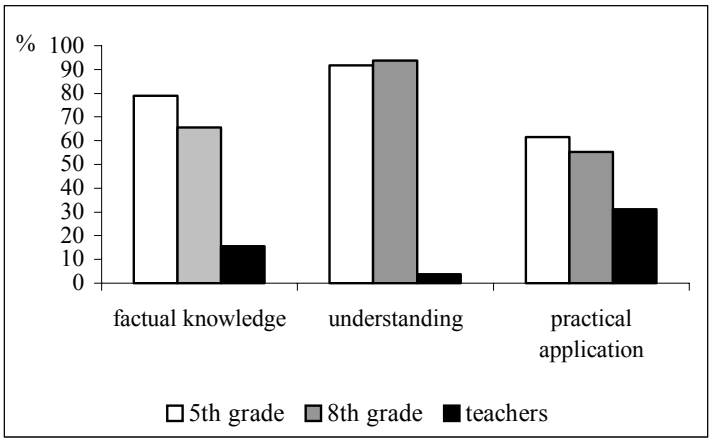
For the passing grade, grade *2*, the students report that they should display knowledge of fundamental things with the help of the teacher and recognize the concepts, whereas understanding of the content is not necessary, but minimal.

This is the opinion shared by 94,50% of 5th graders and 98,96% of 8th graders.

The teachers give the following requirements in order for a student to receive the grade of *2*: to acquire the content of the teaching material in its most primary form, to recognize and, with the help of another, explain some concepts, to take part in

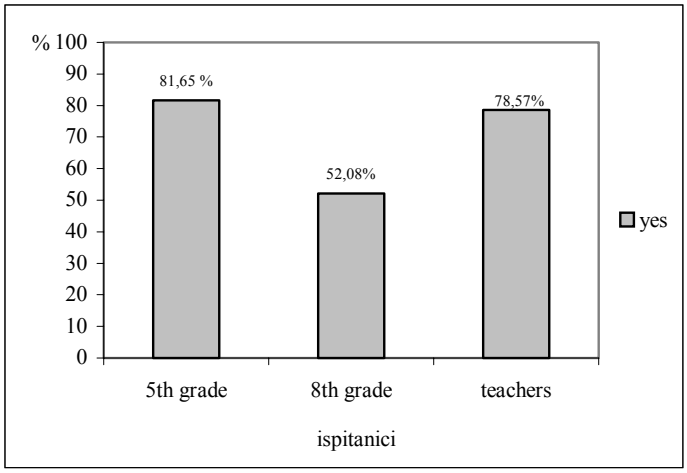
classroom activities, to do everything needed for a *five*, but with the help of the teacher, to display knowledge of 50% of the teaching material.

When assessing the student's knowledge, factual knowledge is the most important (in the opinion of 78,90% of 5th graders, 65,63% of 8th graders and 15,69% of the teachers), as well as understanding (91,74% of 5th graders, 93,75% of 8th graders, and 3,67% of the teachers), whereas practical application is the least necessary (61,47% 5th graders, 55,21% of 8th graders and 31,20% of the teachers). This is presented in graph 6.



Graph 6. The most important components of evaluation

81,65% of 5th graders, 52,08% of 8th graders, and 78,57% of the teachers report that teachers give precise information about the knowledge required for each grade. The response is illustrated in graph 7.



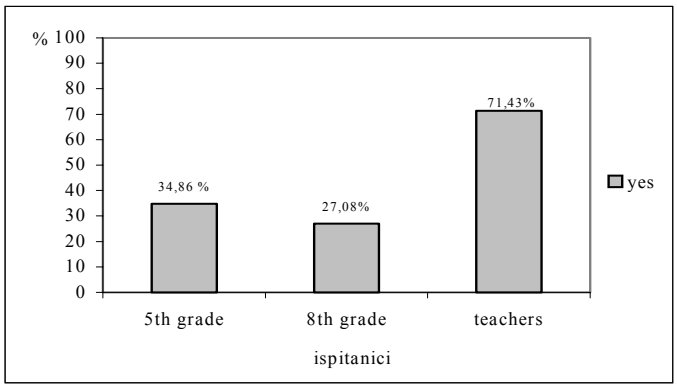
Graph 7. Teacher gives precise description of knowledge required for each grade

10,01% of 5th graders, 62,50% of 8th graders, and 14,29% of the teachers report that the grading is done only once per semester. Teachers continuously assess the work done by students in different situations. This is the opinion of 90,83% of 5th graders, 83,33% of 8th graders and 96,43% of the teachers.

64,22% of 5th graders and 55,21% of 8th graders claim that they should have knowledge of all concepts. None of the teachers give a positive answer.

- **Students' involvement in the evaluation**

To the question whether students take part in the establishment of evaluation criteria, 34,86% of 5th graders, 27,08% of 8th graders and 71,43% of the teachers report about students' participation. The answers obtained are presented in graph 8.



Graph 8. Students' involvement in the establishment of evaluation criteria

26,60% of 5th graders and 25,42% of 8th graders report that they can choose the way they are to be tested. 71,43% of the teachers report that they devise testing instruments on their own.

42,20% of 5th graders, 38,54% of 8th graders, and 50% of the teachers say that teachers provide opportunities for students' continuous self-evaluation.

53,21% of 5th graders and 59,38% of 8th graders claim that teachers appreciate their attitudes and opinions, whereas the same is claimed by 92,86% of the teachers.

Interpretation of Results

Learning is a shared effort made by teachers and students.

The results of the research point at a disparity in the understanding of evaluation standards.

The teachers do not explain objectives precisely. The chi square calculated is 7,39, and it points at a disagreement between the teachers' and the students' answers. Both the teachers and the students expect the standards to be adjusted to the students' capabilities. The teachers use different testing techniques, the most frequent being observation. The students' answers correlate with the teachers' answers (chi square is 1,69, and it is not statistically significant).

The teachers and the students agree about the importance of unambiguousness of the assessment criteria. However, they differently explain the requirements set about that what they must know, understand or do for the best (5) or the passing grade (2). 81,65% of 5th graders and 52,08% of 8th graders know what it is that they should know for each grade.

In the evaluation process there is a great emphasis on the factual knowledge and understanding, whereas practical applications are less important. This was also reported by the teachers in the study (31,20%).

The teachers and the students understand the differentiation of standards differently, too. 64,22% of 5th graders and 55,21% of 8th graders claim that all concepts should be acquired (but at different levels), whereas none of the teachers think they set such criteria.

Little attention is paid to the students' evaluation, the opportunity to choose the testing method, and to the self-assessment.

Interests of the students do not make the basis for the organization of teaching. 53,21% of 5th graders and 59,38% of 8th graders claim that teachers appreciate their attitudes, whereas 92,86% of the teachers report that they use them as the starting point of their teaching. The disagreement in the distribution of answers is obvious.

A closer cooperation between teachers and parents is needed. 46,29% of the teachers are not satisfied with this cooperation. Both the students and the teachers expect the school to be improved, so they give suggestions for it. The current state of affairs in schools points at the need to divide responsibility between all the parties involved.

Evaluation is a process which regulates the system. Many teachers are not well-prepared for correct observation and assessment.

School achievement depends on the ability to use strategies of thought as much as on the knowledge and various well-structured teaching/learning techniques (Inovacije, 1989).

Conclusion

Our research pointed at a discrepancy between the students' and the teachers' understanding of evaluation standards.

The aims that should be achieved are not clearly set and standards do not differentiate between students' abilities. Although the unambiguousness of evaluation criteria is understood, it is interpreted differently by students and by teachers.

Students are hardly taught to evaluate their work. They cannot express their preference for an evaluation technique, and self-assessment is less important or secondary.

A meta-analysis of evaluation is necessary. Then, the teacher could find more successful strategies. Testing, interviewing and measuring do not provide teachers with enough information because they do not correspond with the goals set (Dockrell 2001).

Teaching/Learning is a process in which the communication between teachers and students assumes shared responsibility for final results. The teacher is responsible for the quality of the teaching process, making conditions for learning processes, the quality of knowledge and student's skills. The students are responsible for their learning process and the application of that which is acquired.

In order to make teaching more successful, there is a need for shared understanding of the teaching process and of the evaluation standards.

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PRECIZNI KRITERIJI VREDNOVANJA – UVJETI USPJEŠNOGA UČENJA

Današnje razumijevanje vrednovanja temelji se na ostvarivanju ciljeva koji se vrjednuju te načinu njihove implementacije – sam proces jednako je vrijedan kao i rezultat toga procesa. Predmet istraživanja predstavljen u ovom članku pitanje je do koje granice kriterije vrednovanja razumiju učenici i učitelji u nastavnom procesu, organizaciji kojoj i jedni i drugi pripadaju. Istraživanje obuhvaća 205 učenika i 28 učitelja/učiteljica, a cilj je preispitati jasnoću obrazovnih ciljeva, primjerenost kriterija postavljenih učenicima, učestalost testiranja učeničkog znanja te sudjelovanje učenika u samovrednovanju. Rezultati istraživanja ukazuju na nejednakost u kriterijima vrednovanja.

UDK 371.621.5

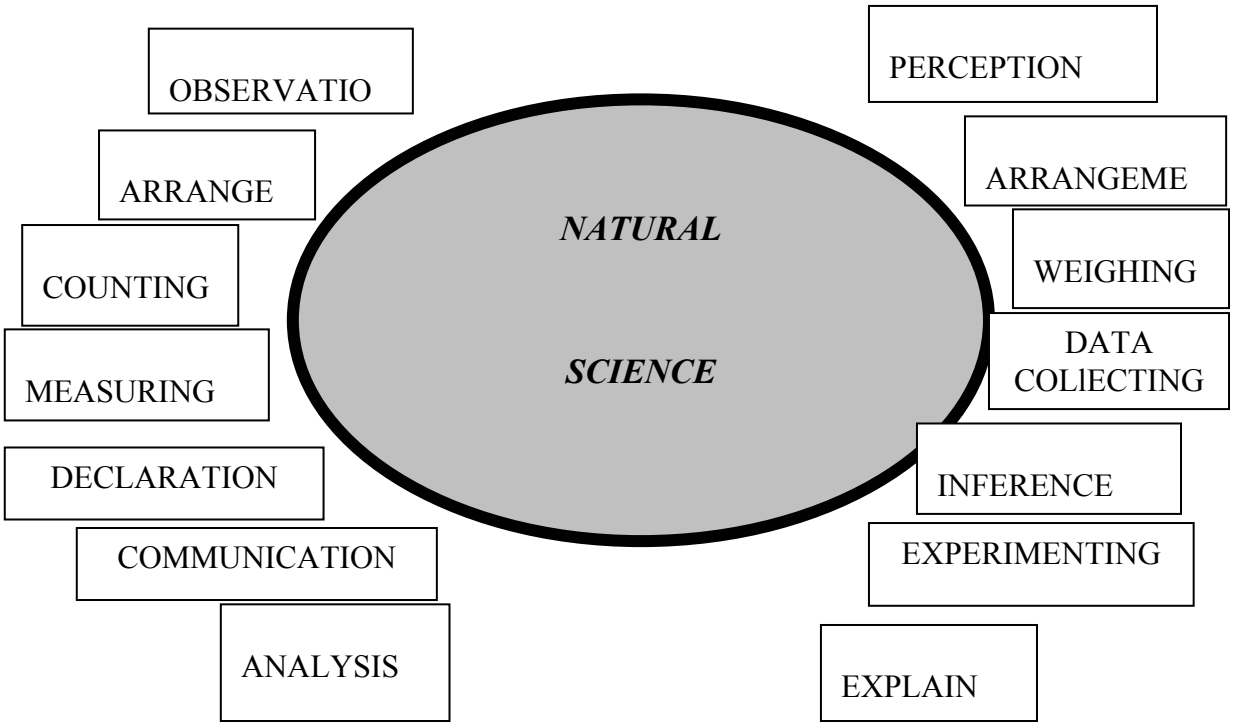
Samo Fošnarič
University in Maribor
Faculty of Education Maribor

INITIAL NATURAL SCIENCE AND THE USE OF CONTEMPORARY EDUCATIONAL TECHNOLOGY

Lessons in initial natural science present an important element to help forming an accurate view of the world. We are not all given the opportunity to get to know the environment directly. Thus, incorporating various teaching material into the learning process is becoming more and more important. With regard to the fact that Slovenia has already started the primary school program with nine grades, we were very interested in the use of contemporary teaching materials when teaching the subject environment cognition within the scope of natural science. The article presents some results of the research which was conducted within the region of Northeast Slovenia.

Introduction

Natural science plays an important role in the upbringing and education of our youngsters, because it helps to form a young personality. Therefore, natural science shouldn't only be a collection of various information that has to be memorized; the cognition of natural science should be fun, enjoyable and challenging. The present age of information and communication technologies is opening completely new horizons for learning, acquiring knowledge, resolving problems and evolving creativeness. On the other hand, as Orel states (*1998: 110*), the technological development represents factors of complete personality development which, within the frame of new ways of social life, enable an all-around learning. We have to realize that we will only be successful at natural science when we teach our students to observe, recognize and get to know nature as well as understand and live with it in harmony. In other words, students need to get to know nature through personal experience. Since there are many different factors involved in the classess of natural science (*Picture 1*), we have to use various teaching aids and material that represent the elements of contemporary education technology.



Picture 1: Methods of natural science as factors of classes

The use of contemporary education technology enables teachers to mediate information in different ways: through pictures, texts, animations or sounds. With regard to the fact that Slovenia has already started the primary school program with nine grades, we were very interested in the use of contemporary teaching materials when teaching the subject environment cognition within the scope of natural science. Thus, some results of the research which was conducted within the region of Northeast Slovenia are presented in the continuation of this article.

Incorporating the contemporary educational technology into natural science

Cognition, learning and teaching are accompanied by different teaching materials which is confirmed by historical facts. Different evaluation of these materials is evident from their different denominations. Jereb (*1987: 9-10*) states that comprehension and denomination is always conducted out of characteristic elements of preparation and the use of these elements in the educational process. Materials were first called helpers, then audio-visual aids, and today we name them contemporary education technology. In contemporary school, especially in natural science, paper, pencil and books cannot be sufficient teaching materials. For classes where children learn through activities that involve naturalistic abilities, concrete materials and organisms are essential. Actually, the most important teaching aid should be the environment. Since schools are situated in different locations and, therefore, have different conditions for teaching natural science, some organizational work methods should be combined with the use of contemporary education technology. Incorporating teaching materials into the educational process has a great didactic value, because it can involve other skills besides

cognitive abilities, like truth, originality, discipline, communicative skills, etc. As an example, the following table (*Table 1*) shows a few possibilities of incorporating teaching materials into the educational process.

Table 1: Insight into the use of teaching materials for individual naturalistic complex

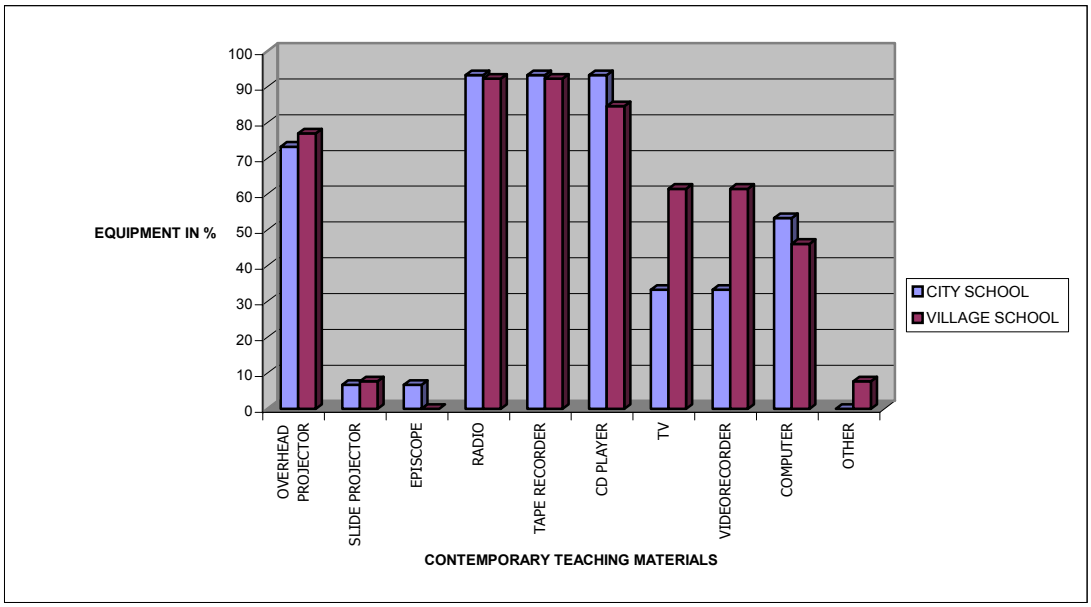
THEMATIC COMPLEX	SUGGESTED CONTENTS	EXAMPLES OF AN ACTIVITY	TEACHING MATERIALS AND AIDS
3. grade **HEALTH** **AND** ME	- most common diseases	- a discussion about health and preservation of health	- overhead projector, television, video-recorder, DVD-player
	- preventing and treating diseases	- to ascertain with experiments the importance of skin for protection of organisms	TV/VCR and video-tapes on health: e.g. *Health, our biggest gift* (Šmuc, Čaks 1995), *Getting to know the nature – Sense organs of humans and other vertebrates* (A group of authors – Filmoteka 16 1996)
	- vaccination	- to observe tiny organisms under a microscope	OHP and OHP transparencies: *Human I and II* (Kovačič 1995)

Our experiences often lead us to the conclusion that there are often big differences between theory and practice. Therefore, we decided to investigate the following:

- how much teachers use contemporary teaching materials (in towns as well as in the countryside)
- how schools are equipped with contemporary education technology
- how often are computers used as a learning tool in initial natural science classes.

Examples of results:

SCHOOLS' EQUIPMENT WITH CONTEMPORARY TEACHING MATERIALS

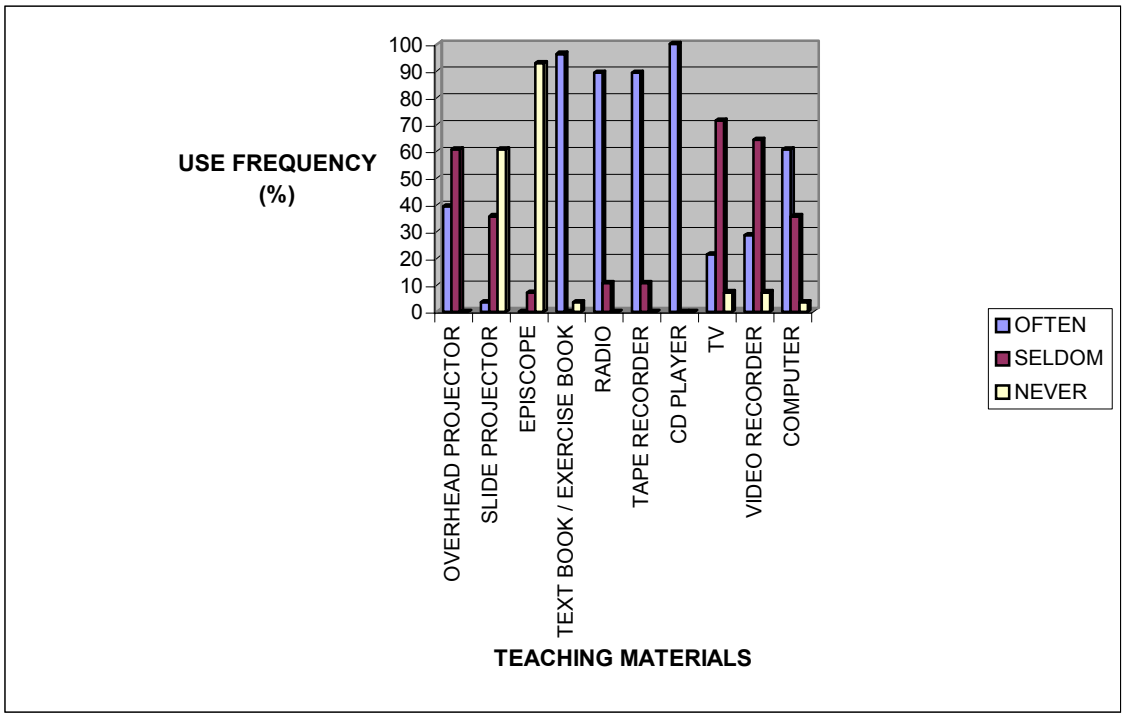


Picture 2: Equipment of town and suburban schools with contemporary teaching materials

From the previous picture (*Picture 2*), it is evident that there are no fundamental differences among schools concerning equipment with contemporary teaching materials. We see that radio, tape recorder and CD player are the most accessible auditive teaching aids while OHP is the most common visual aid. Equipment with audio-visual aids like television, video recorder and also computer is satisfactory. Only one classroom had an LCD projector which was moved to other classrooms when needed. None of the classrooms had a DVD player.

USE FREQUENCY OF TEACHING MATERIALS IN INITIAL NATURAL SCIENCE CLASSES

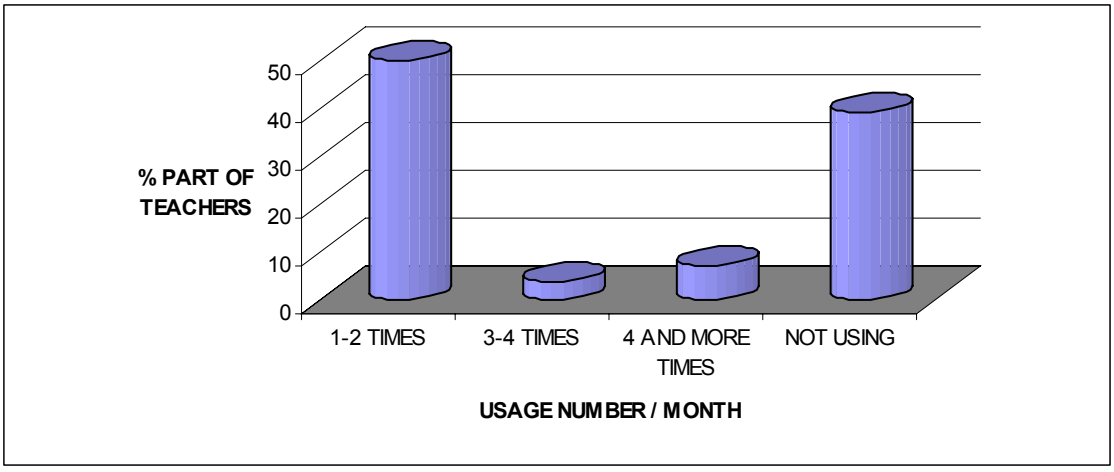
Next picture *(Picture 3)* shows that teachers do not always use what is at their disposal. They most often use auditive teaching aids (radio, tape recorder, CD player). Use of visual teaching aids is relatively small (slide projector and episcope) if we leave out the OHP which is very commonly used. Visual aids were replaced by audio-visual teaching aids like TV/video recorder, DVD player and computer as multimedia learning tools.



***Picture 3**: Use frequency of teaching materials in initial natural science classes*

USE OF DIDACTIC COMPUTER EQUIPMENT IN INITIAL NATURAL SCIENCE CLASSES

Already, Gerlič has asserted in his research (2001: 484-489) that a positive trend is showing in purchasing program equipment. It became evident that teachers very often use various computer equipment (programs) which means that computer labs are frequently used (*Picture 4*).



***Picture 4**: Use of the computer lab in environment cognition classes*

Information and education technology are becoming, more and more, part of our everyday life. Many homes have video and audio devices, a computer, satellite television, and most recently a DVD player, all of which represent an important source of knowledge that almost seems indispensable nowadays. Therefore teachers incorporate different up-to-date teaching materials into their lessons. Besides auditive materials most commonly used with naturalistic topics, they also frequently use textbooks, workbooks, photographs, etc.

Research shows that 80% of teachers incorporate naturalistic-educational TV broadcasts combined with use of other ”classic” teaching aids into their classes. An encouraging data is also the fact that more than 50% of teachers have their computer already in the classroom. All of them also have the opportunity to use a computer outside the classroom – in specialized computer labs, where most of them have access to the internet, although only 10% use the internet in their classes.

Conclusion

Relation of people towards natural science is a result of many factors related with individual psychophysical development, culture of sex and culture of the nation they belong to. For students, natural science is discovering and getting to know the world that surrounds them. They discover the world in different ways, e.g. by touching, tasting, observing, etc. Students cannot always directly experience everything, so teachers can use numerous teaching aids with which they are able to illustrate things, help form conceptions and examine certain objects and phenomena. Therefore, schools, nowadays, strive for every classroom to have as many contemporary teaching materials as possible. Teaching materials do not only function as realization objects during class, their effect and function greatly exceeds the framework of education. With their use schools are becoming more independent, effective and, therefore, more interesting for the students.

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TEMELJNE PRIRODNE ZNANOSTI I KORIŠTENJE SUVREMENE OBRAZOVNE TEHNOLOGIJE

Nastava temeljnih prirodnih znanosti predstavlja bitan element u stvaranju pravilne slike svijeta. Nije nam svima dana mogućnost neposrednog upoznavanja s okolišem. Stoga sve važnijim postaje uključivanje različitih nastavnih pomagala u proces učenja. S obzirom da je Slovenija već počela provoditi program osnovne škole od devet razreda, zanimala nas je uporaba suvremenih nastavnih pomagala u podučavanju subjekta o okolišu u okviru prirodnih znanosti. Članak donosi neke rezultate istraživanja provedenoga u sjevernoistočnoj Sloveniji.

UDK 371.314.6

Margita Pavleković

Zdenka Kolar-Begović

University Josip Juraj Strossmayer in Osijek
Teacher training school in Osijek

TEACHERS' CONTRIBUTION TO THE MODERNIZATION OF TEACHING MATHEMATICS

Results of an experimental research conducted in Croatia in 2002 are presented in this paper. The research was about math teachers' attitudes towards a need for modernization of the teaching of mathematics and about willingness of teachers to contribute personally to a better efficacy of their teaching.

The experimental research was conducted on the sample of 113 primary school maths teachers, who teach 11 to 15 year-old children, and follow the same programme, and 48 secondary school math teachers, who teach 15 to 19 year-old students, and follow different math programmes. In this paper, when we talk about secondary school we think of both three and four year schools, i.e. grammar schools, technical and vocational schools. The teachers involved in the study took part at the 6th Meeting of Teachers of Mathematics of the Republic of Croatia in July 2002 in Zagreb.

The presentation of results was made in the following order:

I. Presentation of the problem
II. Methodology of research
III. Sample
IV. Results
    1. Preparation of maths teachers for teaching
    2. Maths teaching based on real-life problems
    3. Heuristic approach and dynamical forms of work in maths teaching
    4. Modernization of maths teaching with regard to the sex of the teacher
    5. Modernization of maths teaching with regard to the level of teaching.

I Presentation of the problem

For several years a school reform in Croatia has been announced. At the beginning of this year *Koncepcija promjena odgojno-obrazovnog sustava u Republici Hrvatskoj (A Concept for the Change of Educational System in the Republic of Croatia)*[4] was published. It was written by the members of the Educational Council of the Ministry of Sports and Education of the Republic of Croatia. For many years there have been discussions about inadequate programmes for mathematics teaching. However, a programme for open discussion has not been made yet. Teachers have been expressing the frustration with their status and with the working conditions for years, but no improvements have been made yet. Parents are still the ones who invest more in computers for their children than the school[1].

At professional seminars and in teacher's magazines teachers of mathematics report that their students' knowledge and skills are weaker, whereas statistics show that more and more students are graded with an excellent mark.

In the school year 2001/2002 an analysis was made of pairs of the same mathematics lessons given by two different teachers with two different classes of the same generation, the so-called parallel lessons. In one class the teacher worked traditionally, mostly gave a lecture on the subject. In the other class the other teacher gave a lesson on the same subject but she put more effort into motivating students for learning, used a heuristic approach to mathematics teaching, and a different dynamics of exchange of methods and techniques. The other teacher used a more modern approach to the teaching of mathematics. The analysis of such parallel lessons in primary and secondary school was done with respect to the following components:

- the teaching of mathematics based on real-life problems,
- a heuristic approach with more dynamic activities,
- successfulness in motivating students to learn during maths lessons.

Each study confirmed that more creativity on the part of the teacher contributes to more efficiency in the teaching of mathematics[3], not only with regard to knowledge and skills suggested, but also with regard to the development of students' psychological and physiological skills. Therefore, we decided to conduct a research so as to come to more reliable answers to some questions.

The need for a school reform, the need for some radical change in the mathematics programme as well as in the organization of mathematics teaching, requires a more solid knowledge about attitudes of teachers towards those questions.

The objectives of the experimental research were to examine whether teachers thought that the effort put into preparation results in expected outcomes, and whether teachers were ready to make their teaching more efficient by better work organization.

In order for these objectives to be achieved, it was necessary to perform the following tasks:

1. to formulate a questionnaire for primary and secondary school maths teachers,
2. to find out about how often maths teachers teach by giving lectures,
3. to find out about how often maths teachers teach by giving group assignments,
4. to find out about how often maths teachers teach by giving individual assignments,
5. to find out about how often maths teachers teach on the basis of real-life problems,
6. to find out about how often maths teachers think that the effects of their teaching are equivalent to the effort they put into preparation,
7. to find out about whether teachers think they should work more on their preparation and organization for the teaching to become more efficient,
8. to compare results according to the variable *sex (male and female)* and *level of teaching (primary and secondary school)*.

The following hypotheses were proposed:

1. On the basis of the partial insight into the classroom teaching of mathematics (a non-systematic observation of demonstration lessons prepared for university students, systematic observation of state exams of maths teachers, reading university students'

notes on their mentors' work) we could expect that teachers based their teaching to a small extent on real-life problems.

2. It was assumed that teachers applied group work and individual work in mathematics teaching to a small extent.

3. Since primary school students are much younger than secondary school students, it was expected that primary school teachers displayed more readiness to base their teaching on real-life problems, and that they more often applied group and individual work than teachers at secondary level.

4. Since women are traditionally considered to be more sympathetic to the needs of children and youth, it was expected that they were also more willing to base their teaching on real-life problems, and that they were ready to apply group and individual work to a larger extent.

II Methodology of research

For a majority of the questions in the questionnaire, the teachers were given the option to answer on the scale from 0 to 10: zero meant *the least, never, not at all*, and 10 meant *mostly, always, to the fullest*. The results were analysed by the descriptive statistical method. The influence of sex and level of teaching on a certain variable was analysed by non-parametric methods (such as Mann-Whytney U-test and median test), i.e. T-test, when possible. Links between continuous variables were analysed by Pearson's coefficient.

III Sample

The questionnaire was completed by 113 primary maths teachers and 48 secondary maths teachers who took part at the Meeting. The structure of the subjects in terms of age, years of service and sex, and according to teaching level (*primary school A* or *secondary school B*) is presented by the two histograms and two tables below:

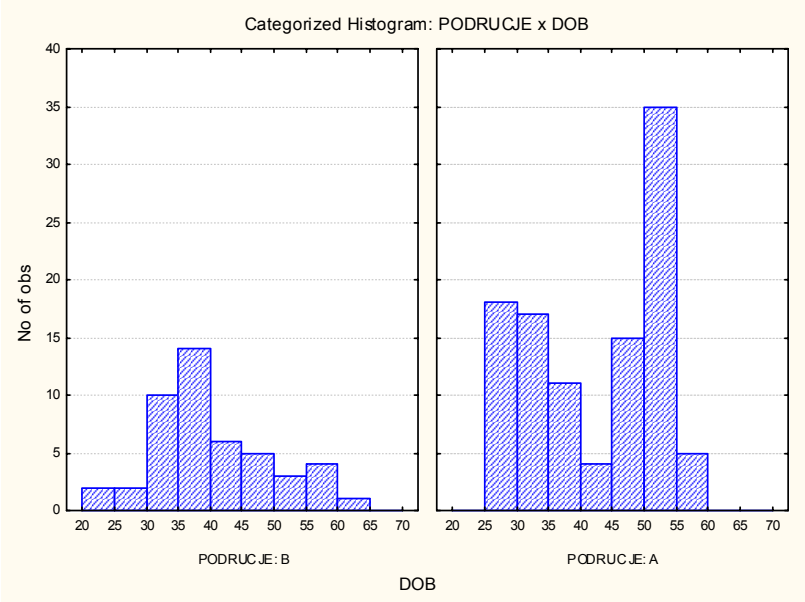

Figure 1. Age of the subjects in intervals of 5 in secondary school (B) and in primary school (A)

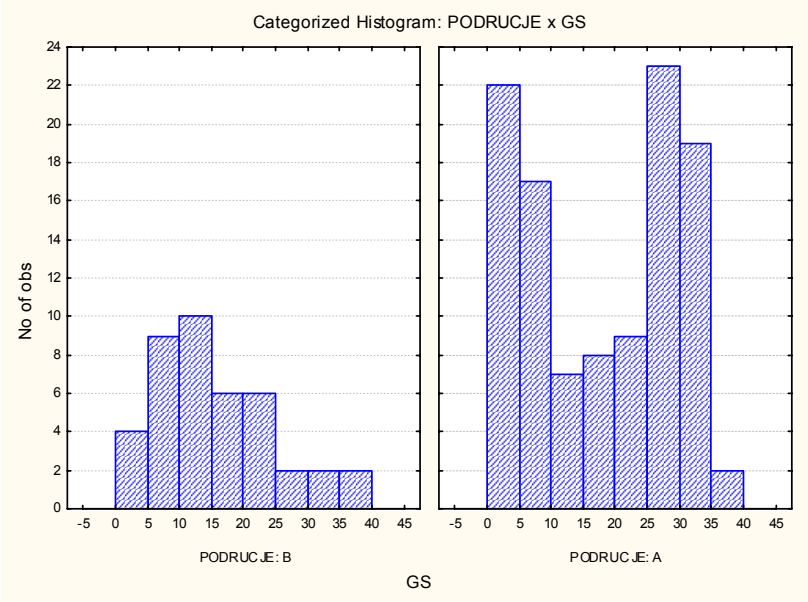

Figure 2. Years of service of the subjects in secondary school (B) and in primary school (A) in intervals of 5.

Table 1. Teachers' population in Croatia in 2002 with regard to sex and level of teaching[4].

Population of math's teachers in Croatia	Sex		Total (with no regard to sex)
Level of teaching	Female	Male	
Primary school teachers	32034	9025	41059
Secondary school teachers	13210	6498	19708
Total (with no regard to the level of teaching)	45244	15523	60767

According to the data received on 3rd December 2002 from the Ministry of Education, there are 2.275 maths teachers in primary schools, and 1192 maths teachers in secondary schools in Croatia.

Table 2. Maths teachers in the sample with regard to sex and level of teaching.

Subjects / Level of teaching	Sex		Total (with no regard to sex)
	Female	Male	
Primary school teachers	89	24	113
Secondary school teachers	40	8	48
Total (with no regard to the level of teaching)	129	32	161

According to the level of teaching, the number of subjects in the sample is proportional to the number of teachers working in primary and secondary schools in Croatia in 2002. With regard to the maths teachers in Croatia, it is necessary to make slight corrections in order to make an increase in the number of subjects working in secondary schools and a decrease in the number of those working in primary schools.

With regard to the sex, the number of primary school subjects in the study is proportional to the number of teachers in Croatian primary schools. However, in secondary population, there should be a slight increase in the number of male teachers and a decrease in the number of female teachers.

IV Results

The arithmetic mean of the teachers' evaluation on the scale 0-10 about the use of *the lecturing type of teaching mathematics* (marked as 2A) is 6.15. In this matter, there are no significant differences in terms of sex, but there are some in terms of the level of teaching. Primary school maths teachers use lecturing type of teaching more often in maths lessons.

The arithmetic mean of teachers' evaluation on the scale 0-10 about the use of *group work* (marked as 2B) is 3.26. In this matter there are no statistically significant differences in terms of the sex or level of teaching.

The arithmetic mean of teachers' evaluation on the scale 0-10 about the use of *individual work* during maths lessons (marked as 2C) is 3.36. In this matter there are no statistically significant differences with regard to the sex, but there are some with regard to the level of teaching. According to the position of the median in B (*secondary school*), we may conclude that teachers in secondary school decide rarely to teach on the basis of individual needs when compared to the teachers in primary school.

In general, it can be said that the teachers involved in the research use lecturing type of teaching much more often than other types of teaching. On the scale 0-10, half of them grade their individual approach in teaching less than or equal to two.

The arithmetic mean of teacher's evaluation on the scale 0-10 about how much *they base their teaching on real-life problems* (marked as 2D) is 3.51. In this matter there are no statistically significant differences in terms of the sex, but in terms of the level of teaching. Primary maths teachers base their teaching more often on real-life problems, although half of them grade this use less than or equal to 3. All of this points at a very low level of usage in general, although efforts for the implementation of real-life problems are stronger in primary school.

The arithmetic mean of teacher's evaluation on the scale 0-10 on the extent to which they are *disappointed with effects of their preparation* (marked as 6B) is 3.35. In this matter there are no statistically significant differences either with regard to the sex, or with regard to the level of teaching. Besides, descriptive statistics lead us into the conclusion that 5% of the teachers are extremely dissatisfied with the results of their lesson planning, 50% are very satisfied, and 45% of them are extremely satisfied.

In order to analyse the groups of teachers with regard to the degree of their content with the effects of their preparation, and the proportion of this variable to the types of teaching and to the readiness of teachers to introduce changes, we divided the variable (6B) into 4 categories. Category (1) consists of teachers who are the most displeased with the effort invested and with the effectiveness of their teaching. Category (4) is made of those who find their lesson plan corresponding to the teaching outcomes best. The variable (2A) for *the lecturing type* of teaching mathematics, the variable (2B) for *group work*, the variable (2C) for *individual work* and the variable (2D) for *the teaching based on real-life problems* were observed in relation to categories (1), (2), (3) and (4). See Figure 3., 4., 5. and 6.

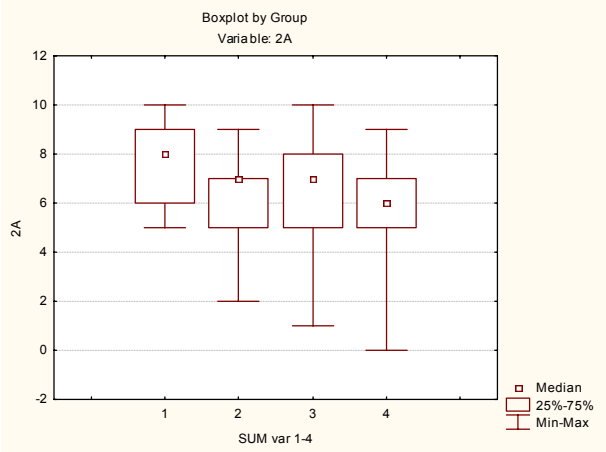

Figure 3. Lecturing type of teaching (2A) according to the degree of the content with preparation, i.e. according to categories (1) – the most displeased, (2), (3) and (4) – most satisfied.

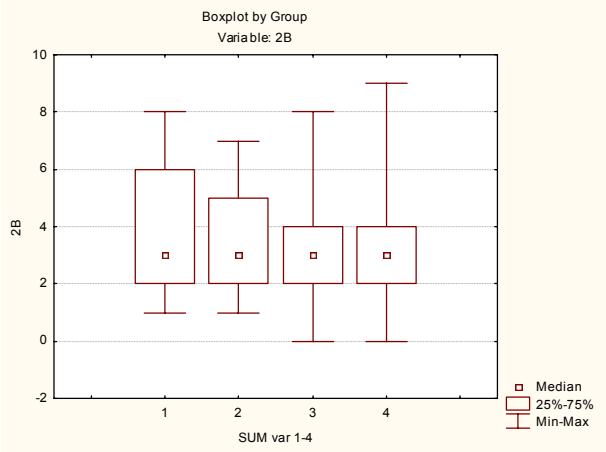

Figure 4. Group work (2B) according to the degree of the content with preparation, i.e. according to categories (1) – the most displeased, (2), (3) and (4) – most satisfied.

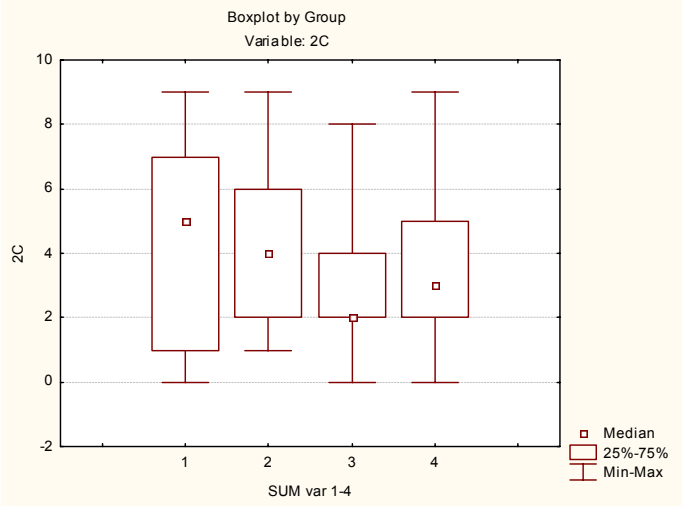

Figure 5. Individual work (2C) according to the degree of the content with preparation, i.e. according to categories (1) – the most displeased, (2), (3) and (4) – most satisfied.

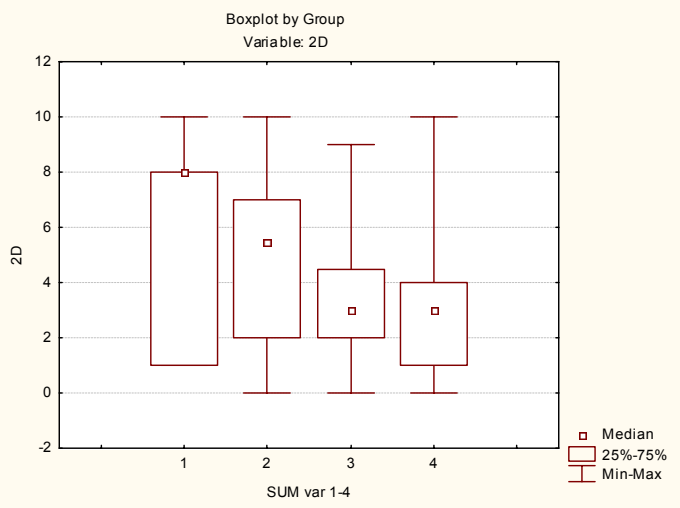

Figure 6. Teaching based on real-life problems (2D) according to the degree of the content with preparation, i.e. according to categories (1) – the most displeased, (2), (3) and (4) – most satisfied.

Median test shows a statistically significant difference from variable (2A), the use of *lecturing type of teaching*, towards categories (1), (2), (3) and (4), i.e. towards *the degree of content with the efficacy of preparation* (Figure 3). The most satisfied with the effects of their lesson plans are the teachers who use the lecturing type of teaching. We believe this is the case because they did not put much effort into the preparation, therefore their expectations are not high.

To the question to which extent *the teachers believe a better organization could contribute to a more efficient teaching* (16C), the arithmetic mean on the scale 1-10 is 6.15. There are no statistically significant differences in the responses of the teachers with regard to the sex, but there are some with regard to the level of teaching. The evaluation of primary school teachers on the organization of teaching which could contribute to a more efficient teaching is statistically significant.

Boxplot in Figure 7. referring to a better organization of teaching, in categories (1), (2), (3) and (4) point at a possible link between the teachers' satisfaction with the effort invested and the efficacy of their teaching, i.e. variable (6B) on the one side, and the willingness of teachers' to organize the teaching process better in order to obtain better results, i.e. variable (16C) on the other side.

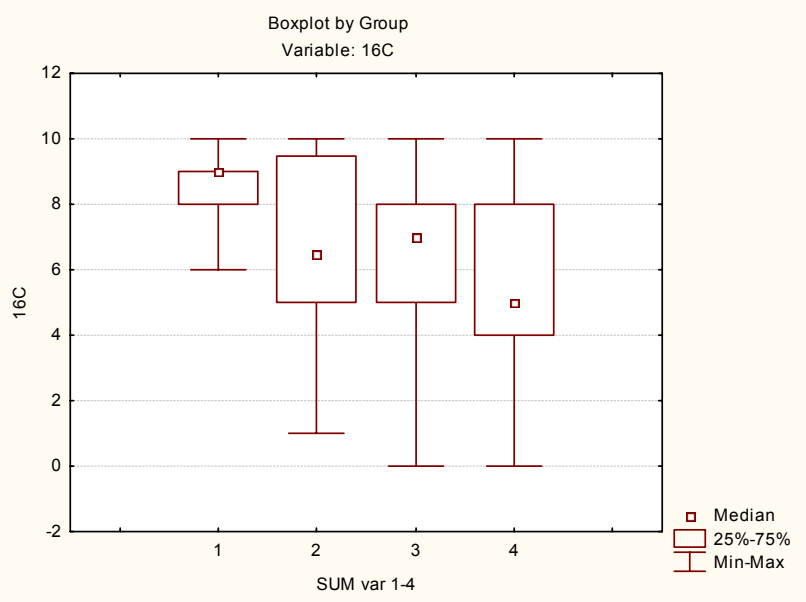

Figure 7. Willingness of teachers to organize the teaching process better in order to achieve better results (variable 16C) compared with the degree of content with the efficacy of preparation, i.e. the categories (1) – the most displeased, (2), (3) and (4) – most satisfied.

The teachers who evaluated their satisfaction with the correspondence between the effort invested into the preparation and the efficacy of their work with a low number on the scale, i.e. expressed their discontent, seem to be the most ready to invest more into the improvement of their teaching, no matter which types of teaching they should use.

The women involved in this experimental research base the teaching of mathematics more often on real-life problems, and they also use group and individual forms of work more often than their male colleagues. Therefore, an impression was created that they are more ready to modernize maths teaching. However, it should be noted that the difference is, in no case, statistically significant. Subsequently, our final hypothesis was proved wrong.

Conclusion

This experimental research points at a low frequency of application of more dynamic forms of teaching in the maths classes, at a relatively high level of teachers' satisfaction with the effects of their preparation, and, in general, at a high awareness of teachers of the need for organizational changes so as to achieve more teaching efficiency. In this matter, a very high degree of teachers' satisfaction with the effects of their lesson planning (most of whom are in favour of the lecturing type of teaching) leads to the conclusion that many teachers do not recognize the methods and techniques they use as that what should be changed, but have an understanding of the organization of teaching which includes some other elements of organization.

In the next step of the research we plan to investigate the elements which, in teachers' opinions, should be changed. For this purpose, the questionnaire should be extended and it should also involve a bigger sample. We are aware that the results were obtained with a sample inadequate for Croatia since the questionnaire was fulfilled by

teachers at one conference. Therefore, we find this experimental research to be just an introductory part of a more extensive research.

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DOPRINOS UČITELJA MODERNIZACIJI NASTAVE MATEMATIKE

U članku su prikazani rezultati eksperimentalnog istraživanja provedenog u Hrvatskoj 2002. godine Istraživanje se bavi stavovima učitelja matematike o potrebi modernizacije nastave matematike te o želji učitelja da osobno pridonesu boljoj učinkovitosti njihove nastave.

UDK 37.03.036

Matjaž Duh
University in Maribor
Faculty of Education Maribor

THE ROLE OF GENDER IN THE INNOVATIVE APPROACH TO THE EVALUATION OF FINE ARTS IN THE PRIMARY SCHOOL

The evaluation of fine arts is an extremely complex activity, in which the processes of communication and interaction create a multidimensional system of didactic procedures and communications serving as a means for the achievement of aims and tasks in fine arts. The innovative approach to summative evaluation in the process of teaching fine arts was experimentally tested, and it produced good results. The development of all factors defining children's artistic abilities was statistically more significant in the experimental group than in the control group. Testing the role of gender in the experimental group showed that the innovative approach to summative evaluation in the process of teaching fine arts presents a phase of the educational process, which is equally suitable for all pupils, irrespective of gender.

1 Introduction

The evaluation of fine arts is an extremely complex activity in which various and demanding teacher and pupil activities, as well as other factors of teaching are combined through educational aims, contents and procedures. The communication and interaction processes in the evaluation phase of teaching fine arts form a multidimensional system of didactic methods and communication which are used for the implementation of aims and tasks in the teaching fine arts.

Present findings show that the pupils are developing their abilities of aesthetic evaluation gradually by a permanent wilful observation of their own or their peers' art products, by actively contemplating individual original or well reproduced works of art and by the observation of aesthetic components of useful objects. Although it is difficult to supervise and evaluate all the components of fine art culture, which is complex and multilayered, some aims of contemporary teaching of fine arts are directed towards the training of appreciation of fine arts, creating an appropriate attitude towards artistic phenomena, useful objects and environmental art problems. Beside the question how, what with and in what way to supervise and evaluate these components, the question of the role of gender in teaching fine arts is being studied.

2 Short presentation of innovative approach to summative evaluation in the process of teaching fine arts

In our research we have experimentally tested the innovativeness of the approach to summative evaluation in the process of teaching fine arts. This can be clearly seen in all aspects of the planning stage, according to both methodical, organisation and content characteristics, according to didactic communication and to the characteristics of activities, role and relationships between the teachers and pupils.

Regarding methodological and organisation characteristics of summative evaluation in the process of teaching fine arts, we have introduced most of the novelties into the current school practice mainly from those two aspects. This would not have been possible without a well prepared content base of educational work at the evaluation stage of the teaching of fine arts. The combination of general methods, which

are mainly based on cognitive and educational processes, with specific methods, correlating the general ones with the pupils' abilities at fine arts, is a novelty in the evaluation phase.[1] Dynamic changing of individual teaching methods in summative evaluation during the process of teaching fine arts stimulates pupils to visualise evaluation criteria and to discuss the criteria, compare them with the exhibited works of art and physically move the works to the place of exhibition in a new way, according to particular artistic characteristics.[2] In this way all their senses are included in the evaluation phase of fine arts instruction.[3] Specific methods of fine arts instruction which refer to the particularities of artistic aesthetic field, the specificity of artistic creativity, to the respect of individual differences and the complexity of the art phenomenon, present an appropriate basis for the development of didactic communication. Besides creating a suitable emotional climate when exhibiting children's works of art, the didactic communication stimulates teachers and pupils to evaluate artistic work actively according to the set criteria.

Innovativeness in the organisational sense is shown in the manner of presenting children's work of art and above all in the permanent presence of evaluation criteria. The criteria are presented very clearly during the whole process of teaching fine arts, which results in a new quality of our school practice. The presence of those criteria influences favourably the process of artistically creative work, and teachers' as well as pupils' activity in formative evaluation and in summative evaluation during the final phase of the process. The transparency of the exhibited works of art and the evaluation criteria ensures pupils equal conditions for active participation in this particular phase of the process of fine arts instruction.

Innovativeness, as far as the content is concerned in the evaluation phase of fine arts instruction, is shown in the choice and presentation of the evaluation criteria which have been universally conceptualised, independently of the field, technique, problem, motif and task at fine arts and which included the essential layers of the children's work, being terminologically clarified to pupils.[4] The quality of evaluation criteria stimulated a cooperative, fair and sincere didactic communication. Verbal messages were in agreement with or adjusted to non-verbal behaviour. Specific teaching methods lead to sincerity, congruency and symmetry of didactic communication.

Organization of work and clear criteria played an important role in the establishment of positive relationships between the teacher and the pupils, since they presented a qualitative framework for the content of communication. The organization of educational work enabled a direct contact between the pupils, the teacher, works of fine art and evaluation criteria. In this way the conditions for a relaxed, emotional and social climate were created. This activated pupils to take the initiative in analysing the works of fine arts, and helped them comment their own endeavours as well as search for the parallels in the works of their classmates. The evaluation at fine arts became more successful, since the pupils were accompanied by intellectual and also emotional

[1] The phases in teaching fine arts follow the same pattern as in the process of creativity (learning-preparation; play- incubation; creating-illumination; work-realization; evaluation-verification).
[2] The works of art were presented by the pupils who connected them e.g. according to the choice of colours, choice of format, composition, etc.
[3] In this way the pupils have activated the visual (V), auditory (A) and kinaesthetic (K) perception system, since they have sensed the contents in the evaluation phase visually, auditorily and physically.
[4] The basic scheme of criteria, prepared by teachers for each didactic unit in the process of teaching fine arts, consists of 4 criteria: the criterion, deriving directly from the presented problem; the criterion, deriving from the task of fine arts including other aspects of art phenomenon; the criterion deriving from the factors of artistic creativity; the criterion deriving from the command and creative application of artistic technique.

experience of artistic phenomenon. The latter established their relation to this particular phase of learning and stimulated the level of their activity. We have devoted certain attention to the creation of emotional climate, since the result of the artistic appreciation depends on the emotional experience as well as on clear and transparent evaluation criteria – is the evaluation phase in the process of teaching fine arts attractive or will the pupils reject it, will the evaluation be interesting or not, pleasant or unpleasant – it all depends on emotional experience.
The efficiency and success of such an innovative approach in the evaluation phase was tested experimentally in our research.

3 Planning the research

The principal goal of the research was to measure the effect of the previously described innovation experimentally or of the experimental model in the evaluation phase of teaching fine arts on artistic sensitivity of pupils from the elementary school. Besides the influence of the innovation we were also interested in its direction, namely whether the influence has a positive or a negative influence according to the control group. Likewise, we wanted to investigate the role of gender in the conditions of experimental evaluation in fine arts.

Innovative approach to summative evaluation in teaching fine arts presents a set or a series of activities, which are intertwined and constantly interdependent and also at the same time lead to one another. When planning experimental work, we have conceived the innovative approach on the basis of new findings and experience of teacher's and pupils activities, wanting to improve children's artistic abilities. We supervised the development of pupils' abilities from the aspect of artistic creativity, artistic appreciation abilities and creative-formal development.

Six primary schools were included in the experiment (three experimental and three control ones). Four of them are located in the town, the other two in the suburbs. In order to make the compared groups more equal/similar according to the stratum, we introduced each modality of the experimental factor in the schools proportionally according to the adherent stratum. There were 129 pupils (n = 129) of the sixth grade involved in the research, 66 (48.83%) in the experimental group and 63 (51.16%) in the control group. The initial testing took place in September 1999; the experiment (the introduction of innovative approach in the experimental group) lasted 22 weeks (44 hours of fine arts). The final testing occurred in April and May 2000. The innovative approach was introduced gradually as a novelty in the experimental work, which was well accepted by both pupils and teachers. The latter could test the success of the new approach simultaneously with the underlying theoretic origins directly in their teaching practice. In this way the experimentally tested innovation acquired also a personal note of teachers and pupils.

The analysis of the obtained results showed that the experimental group had an advantageous position in the development of all factors influencing the child's artistic development. This confirmed the positive influence of innovative approach in the evaluation phase on the child's development in fine arts. By applying the innovative approach we wanted to clarify the role of gender. There were 31 boys (47%) and 35 girls (53%) in the experimental group. We, therefore, examined whether the innovative approach in the evaluation phase would suit the girls or boys more, or whether it is independent of gender.

4 Results and interpretation

When testing the role of gender in the development of individual factors of the child's artistic development, we used the method of analysis of variance (F-test).

Table 1: The parameters of descriptive statistics and the results of general F-test of the differences between arithmetic mean (the analysis of variance) with the F-test of homogeneity of variance (Leven's F-test) of the final general results of artistic creativity (CREAT2), artistic appreciation ability (APA2), artistic creative development (ART-CRE2), artistic-formal development (ART-FOR2), and artistic creative-formal development on the whole (DEVEL2).

Factor	Gender	Minimum value	Maximum value	Arithmetic mean	Standard deviation	The coefficient of asymmetry	The coefficient of flatness	The analysis of homogeneity of variances		The analysis of variances	
		MIN	MAX	$\bar{x}$	s	g1	g2	F	P	F	P
CREAT2	male	5	21	13.323	4.004	0.023	-0.403	2.782	0.100	0.198	0.658
	female	8	21	13.714	3.130	0.220	0.398				
APA2	male	11	25	19.419	3.452	-0.212	-0.061	0.813	0.365	0.387	0.536
	female	12	25	19.914	3.013	-0.556	-0.679				
ART-CRE2	male		73	55.387	9.780	0.180	-1.244	0.341	0.562	0.023	0.881
	female	31	71	55.029	9.556	-0.464	-0.247				
ART-FOR2	male	70	127	95.613	15.735	0.131	-1.089	0.274	0.603	0.269	0.606
	female	74	124	97.543	14.494	0.117	-1.164				
DEVEL2	male	116	195	151.000	24.833	0.126	-1.291	0.300	0.586	0.071	0.791
	female	106	195	152.571	23.077	-0.106	-0.940				

The level of general creativity at fine arts (CREAT2)[5] is higher with girls, the values of maximal and minimal results and the average are higher. The distributions of frequency are in agreement with a symmetrical, regular form of distribution. The hypothesis about the homogeneity of variance is justified (F=0.278, P=0.100) and the null hypothesis confirms the difference between arithmetic means. **Thus, the development of artistic creativity is rather congruent with boys and girls of the experimental group.**

The level of artistic appreciation abilities (APA2)[6] according to the parameters of descriptive statistics (MIN, MAX, $\bar{x}$) shows similarities between boys and girls. The distributions are quite symmetrical and regular. The results of girls and boys are similar; therefore, the hypothesis about the homogeneity of variance is justified. **There is no significant statistical difference between arithmetic means of the results in the analysis of factors of the level of artistic appreciation.**

The parameters of descriptive statistics (MIN, MAX, $\bar{x}$) at the **level of artistic creative development (ART-CRE2)**[7] show that there are no distinctive differences between the two genders. The distributions are mainly symmetrical and regular.

[5] The level of general artistic creativity arts was observed as a mutual interaction of individual factors of creativity by means of LV1 test.
[6] The levels of artistic appreciation abilities (APA) of pupils were observed in the research (LV1 test) through the level of the artistic perception (PERCEP) and reception (RECEP).
[7] The level of artistic creative development (LV2 test) was observed through individual factors of artistic creative development i.e.: redefinition (ART-RE), originality (ART-OR), elaboration (ART-EL), sensitivity to problems at fine arts (ART-SEN), flexibility (ART-FLE) and fluency (ART-FLU)

Standard deviations are accordant, so the hypothesis about the homogeneity of variances is justified. **No statistically significant differences between the boys and the girls are present in any factor of artistic creativity and the artistic creativity on the whole.**

The parameters of descriptive statistics (MIN, MAX, $\bar{x}$) at **artistic-formal development (ART-FOR2)**[8] do not show the existence of systematic advantages of either girls or boys. The distributions are mainly symmetrical and regular. The variance of results of individual groups shows resemblance in all factors, therefore, the hypothesis about the homogeneity of variances is justified in all cases. **No statistically significant differences were noticed between the two genders** in artistic formal development**.**

The variation of values in the **creative-formal development on the whole (DEVEL2)**[9] is similar, therefore the analysis of variance is based upon the justified hypothesis of homogeneity of variance (P=0.586). Its results lead to the conclusion that **no statistically significant difference between the boys and girls of the experimental group is seen in the artistic creative-formal development (P=0.791).**
Testing the role of gender statistically proves that no statistically significant difference between the boys and girls is noticed in artistic appreciation abilities at the level of individual factors as well as at the level of artistic creative-formal development on the whole. Experimentally tested innovative procedures of the summative evaluation in the process of fine arts give both genders equal opportunities to progress and succeed in the creative-formal development.

In our study we have used the discriminatory spatial analysis of 14 variables to test the existence of eventually possible structural differences. These variables are:

1. final general artistic creativity - CREAT2
2. final level of artistic-appreciation abilities - APA2
3. final level of redefinition – ART-RE2
4. final level of originality – ART-OR2
5. final level of elaboration – ART-EL2
6. final level of sensitivity to the problems at fine arts - ART-SEN2
7. final level of flexibility - ART-FLE2
8. final level of fluency - ART-FLU2
9. final level of formal development – FORD2
10. final level of optical-thematic development - OTD2
11. final level of artistic taste – TART2
12. final level of formal experience and techniques at fine arts – FET2
13. final level of individuality – IN2
14. final general artistic level– GAL2

The solution of the performed analysis depicts one discriminant function with the following statistic characteristics.

Table 2: General data on the results of discriminatory analysis in 2 groups

[8] The level of artistic formal development was observed in the research (test LV2) through individual factors of artistic formal development: formal development (FORD), optical–thematic development (OTD), the level of taste for fine arts (TART), formal experience and artistic techniques (FET), individuality (IN), and general artistic level (GAL).
[9] The level of creative formal development on the whole (DEVEL) presents reciprocal effects of individual factors in the artistic-creative and artistic formal-development.

Function	Eigen value λ	% explicated variance	The coefficient of canonical correlation Rc	Wilks' Lambda Λ	The results of χ^2 test χ^2	g	P
1	0.395	100.000	0.532	0.717	18.967	14	0.166

The identified discriminant function is not statistically significant ($\Lambda = 0.717$; $\chi^2 = 18.96$; $P = 0.166$), its eigen value ($\lambda = 0.395$) and the correlation with the system of binary variables ($Rc = 0.532$) are low.
We will not interpret the contents of the identified function, since its discriminatory power is too weak. We may, nevertheless, come to the conclusion that the **experimental innovative approach in the evaluation phase of teaching fine arts is appropriate for both genders also from this aspect of the development of individual factors.**

Our study also tried to investigate the eventually possible existence of differences between the initial and final levels, which was statistically proved by using the t-test on the following four indicators:

- Initial and final level of general artistic creativity (CREAT1, CREAT2)
- Initial and final level of artistic perception (PERCEP1, PERCEP2)
- Initial and final level of artistic reception (RECEP1, RECEP2)
- Initial and final level of artistic creative-formal development (DEVEL1, DEVEL2).

Table 3 : The results of differences between arithmetic means, based on the t-test, and homogeneity of variances, based on the F-test (Leven's F-test), the results of initial (I) and final (F) level of indicators of change related to artistic-creative formal development of pupils, within individual gender categories of the pupils in the experimental group.

Indicator	Gender	Phase	Arithmetic mean $\bar{x}$	Standard deviation s	The homogeneity of variances F	P	t – test t	P
CREAT	male	I	10.129	4.403	0.265	0.609	6.224	0.000
		F	13.323	4.003				
	female	I	11.229	2.809	0.182	0.671	5.798	0.000
		F	13.714	3.130				
PERCEP	male	I	10.645	1.942	0.079	0.779	0.781	0.441
		F	10.936	1.825				
	female	I	10.771	1.717	0.658	0.420	2.371	0.024
		F	11.457	1.442				
RECEP	male	I	7.323	2.762	0.378	0.541	2.163	0.039
		F	8.484	2.541				
	female	I	6.686	2.816	0.393	0.533	3.438	0.002
		F	8.457	2.559				
DEVEL	male	I	129.452	2.,342	0.001	0.971	3.515	0.001
		F	151.000	24.833				
	female	I	132.343	20.479	1.890	0.174	5.513	0.000
		F	152.571	23.077				

The hypothesis about homogeneity of variances is justified in all indicators. During the experimental work, **no statistically significant differences in the variability of results appeared** within the two categories of gender.

Some differences are seen in both genders at the average level of CREAT, RECEP, DEVEL, namely in higher final results of the experimental group. PERCEP is an exception, since there are statistically significant differences in the final results of the girls ($t = 2.371$, $P = 0.024$), but they do not appear in the boys category ($t = 0.781$; $P = 0.441$). Since we were not further developing the artistic perception directly in the experiment but only indirectly, we may conclude that the girls are more sensitive to it than the boys.

The results of the progress of the pupils' in the experimental group point out, that under the conditions of experimental innovative work in summative evaluation in the process of teaching fine arts, both girls and boys have progressed in CREAT, RECEP and DEVEL. Some positive effects are noticed also in PERCEP, with the exception of the fact that the progress of the boys in comparison with the girls was not statistically significant.

From this point of view it can be concluded that similarly to the aspect of the differences in the development of individual factors and structural differences, our experiment is appropriate for the pupils of different gender.

5 Conclusion

The aim of our research was to examine or verify, besides many other parameters, the role of gender from the aspect of differences in the development of individual factors in artistic-creative and formal development, as well as from the aspect of structural differences between the pupils and their progress during the course of the experiment. We found out that no statistically significant and neither structural differences dependent on gender exist between the girls and the boys at the level of individual factors of artistic development. But we established the existence of statistically significant progress of pupils of both genders in the experimental group.

Based on these findings we denote the experimental innovative approach to summative evaluation in the process of teaching fine arts as one of the phases in the educational process, which is equally suitable for all pupils, irrespective of gender.A detailed and carefully planned basis of innovative approach in the evaluation phase of teaching fine arts depicted in our survey present a good foundation for the practical application in the educational practice in the process of teaching fine arts.

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ULOGA SPOLA U INOVATIVNOM PRISTUPU VREDNOVANJA UMJETNIČKIH PREDMETA U ŠKOLI

Vrednovanje umjetničkih predmeta izrazito je složena aktivnost u kojoj proces komunikacije i interakcije stvara višedimenzionalan sustav didaktičkih procedura i komunikacija te služi postizanju ciljeva i zadataka u umjetničkim predmetima. Inovativni pristup kod završnoga vrednovanja u procesu nastave umjetničkih predmeta eksperimentalno je ispitan te je pružio dobre rezultate. Razvoj svih čimbenika koji određuju dječje umjetničke sposobnosti pokazao se statistički značajnijim u eksperimentalnoj skupini, od one u kontroliranoj skupini. Ispitivanje uloge spola u eksperimentalnoj skupini pokazalo je kako inovativni pristup kod završnoga vrednovanja u procesu nastave umjetnosti predstavlja etapu u obrazovnom procesu koja odgovara svim učenicima, bez obzira na spol.

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Beatriz Tomšič - Čerke
University of Ljubljana
Faculty of Education

ART EDUCATION: ABOUT STUDENT'S SPACIAL EXPERIENCE IN CONTEMPORARY VISUAL MEDIA WORLD

The last two decades meant a revolution in the world of visual media. Many important consequences of these changes are due to the media students daily »use« like TV, video and the computer. Among them, we can mention a specific experience of space representation which every student »carries with him/herself« to the class. It is based on facts as the increasing speed of »passing« images, mechanical simplicity and wide possibilities in the resolution of different technical problems.
With these ideas in mind, we arrived to interesting reflections on the basis of the results of an investigation, which took place among 1st year secondary school students (high school degree) in Slovenia. Students had to answer questions describing their most favorite place to a friend who was blind. They were based on the different senses to perceive space and spacial characteristics of things.
The results of the investigation showed – among other facts - that the mayority of the involved students considered the information related to the sense of touch irrelevant. On the basis of these figures, we tried to understand the context of art education at the begining of the twenty first century and to outline the challenges it faces at this particular historical moment.

Introduction

I – New technologies and the revolution in the world of visual media

As the age of electronic images began, the proliferation of new technologies affected almost all aspects of our lives and meant a revolution in the world of visual media. As it is widely known, it is referred to as the pictorial turn age in comparison with the linguistic turn, which prevailed in the seventies of the twentieth century. This is the context of an inevitable number of very interesting inquiries which become highly significant when applied to the field of education. Especially deserving to be noticed are those media pupils are in contact with daily, like television or video, their colourful, fast moving sequences of images and, of course, computers with the wide range of possible uses and experiences: scanning and combining images, experimenting with tools offered by different programs, the possibility of multiple printing and, as a matter of fact, the divergency between printed and »screen« image. These changes do not only mean increasing speed of »passing« images, mechanical simplicity and wide possibilities in the resolution of different technical processes, but, first of all, a specific experience of space perception and representation which every student »carries with him/herself« to the class and is obviously essential to art education. Needless to stress on the direct and indirect influences and connections between the developement of visualization not only in the case of art, but of other school subjects which deal with visual representation, in the context of new spacial experiences for students.

As it is well known, computers are making new and unique esthetic experiences possible and changing the way in which art is conceived, created and perceived. Numerous images are produced with widely available, highly interactive and user friendly software. A new world has opened for artists as well as educators and their students. Technology developement seems to require the teaching profession to make changes at an unprecedented rate and opens a wide number of questions. Some of them

are relevant to artistic as well as teaching practice. For example: can the pressing of a button substitute or replace the painstaking mixture of paint on the painters palette and its laying on the canvas?, is it possible to compare in any aspect the results of multiple printing of the computer to the different technics of engraving?, is it possible to compare the implications of drawing (and solving problems) on the basis of a computer program to traditional architecture drawing?. If we are possitive in our answers to these questions, some new inquiries become actual: which elements of the process of learning will, in the future, improve the developement of hand skills needed in writing, painting, drawing and/or modelling. It is also possible to suppose that the ways of learning will change, if it is true, that writing as well as drawing is an instrument to express - way of sketching - thoughts. Needless to point out the importance of this supposition when talking about the developement of the capacity to image space relations, especially when imagination is no longer needed to understand space in drawing, painting etc. Another interesting question is related to the »pedagogical« consequences of the try-error method offered by the computer.

II- A glance at history

History offers an interesting and revolutionary example to compare how life changed in various aspects, especially those related to the problem of visualization of space, the definition of nature and history and the representation of space for different applications in the 15th century with the invention of print. In the field of art we can mention the reproduction of art works in books and other printed material. However, it is not possible to affirm was print the main cause of this revolution, but it was surely a very important factor which promoted, at the same time, the developement of writing. In fact, it was a time which many authors define as a turn from an oral to a visual reading culture: the perception of the written page space, the relationship between visualization and memory, the introduction of orthographic signs, the standardization of typography, only to mention a few elements which collaborated in the radical change of mental habits. These also meant a revolution in didactics if we remember that, for example, Galeno's, Ptolomeo's and Vitruvio's texts were for the first time »standardly« illustrated, that is, was for the first time possible to print maps for geography, diagrams, cards for different subjects like chemistry or biology and in the end to print – and popularize - illustrated books for children. An important question opens at this point: if it is possible to draw a parallel developement between the links among written (printed) and spoken words and the possibility to visualize space relations and the increasing accuracy in their representation through two-dimensional models – drawings. In fact, this was also the moment when architectonic drawing as we know it today, was born, with it, a totally new conception of space design.

We can easily conclude that print and its consequences meant a radical transformation in the conditions of intellectual life at the end of the 15th century and that these consequences are still actual. Because of their importance and the possibility to compare nowadays situation, it is relevant to have them in mind when thinking about the challenge electronic media mean at school. At this point it is also possible to conclude that the computer is not only a tool for artistic creation and appreciation but much more...

Methods

Still, it is very early to venture a theory or even an answer to the question on all the fields in which the computer will revolutionize our school every day. Even more

difficult is to make definitive, concrete and detailed comparisons between the two mentioned historical ages.

However, we will try to sign significant fields in which differences are to be expected. We will concentrate this time on the personality of the »expected« contemporary or future student. As strange as this introductory definition may seem, we arrived at it on the basis of the partial results of an investigation which took place among 1st year secondary school students (high school degree) in Slovenia. It took place in the context of the contents specifically planned for the field of architecture by the subject Art education. We analized the answers of aproximately two hundred students from schools all over the country.

Among other tasks, which are not significant for this disertation, students had to answer the following question: Imagine you are describing your most favorite place to a friend who cannot see, who is blind. Answer ONLY the questions you consider to describe your place in the most convincing and persuasive way. Every student got eleven possible questions which are based on the different typical senses to appreciate and perceive space and spacial characteristics of things:

1. Describe what you hear?
2. Describe what you smell?
3. Describe what you feel with your fingertips?
4. How would you describe the temperature?
5. How would you describe the light in space?
6. How would you describe the humidity?
7. How would you describe the space?
8. Describe what colours you sense?
9. Describe what your sense of size is - do you feel restricted, limited in any way?
10. Describe if you feel free in this place?
11. Would you suggest or add anything to your description?

Results and discussion

The answers were analized in two phases: firstly, we considered the number of positive answers. That means the number and kind of questions that every student chose to answer because he/she thought the information would be important to describe the place. Secondly, we analized the positive answers and the kind of given information. Five categories were elaborated to clasify the answers: 1. objective description/narrow: no more than two objective descriptive facts mentioned, 2. objective description/wide: more than two objective descriptive facts mentioned, 3. subjective description/narrow: no more than two subjective facts mentioned, 4. subjective description/wide: more than two subjective facts mentioned, 5. positive or negative answer without description. It is important to state the meaning of the adjectives objective and subjective in our clasification. As to the first, we meant facts that can be measured, numbered or clearly specified (like colour, name and kind of used materials etc.). As to the second, we understood descriptions were prevailed adjectives of value, like very personal, metaphoric, unmeasurable facts (for example the state: »In this place I feel like a bird«).

The results of the investigation showed that the majority of the involved students considered as irrelevant the information related to the sense of touch: 57,84% did not answer the question. As well, the majority, 55,68%, did not answer the question on the description of the humidity in the place. In regards to the question »what do you smell?«, in spite of the fact that the figures are positive, the difference is not as important as in the case of the other questions: 55,67% answered the question. These

figures become relevant because they are radically different from the results regarding the topics as the sense of hearing, the description of the temperature, the light in space. In these cases an average of 65% of the students answered the questions. The higher figures belong to the inquiry on colours and the general characteristics of the place, with an average of 82% answered questions. The questions »what is your sense of size - do you feel restricted, limited in any way? and do you feel free in this place? in general got a high number of answers of the kind yes/no. 66,49% of the students did not answer the question »would you suggest or add anything to your description?« (see figures 1 and 2). As it is possible to see in the graphs, the majority answered with narrow facts, only the questions about colours, and the description of space got a better average of wide answers.

However, it is not possible to bring definitive conclusions which would in any way connect the increasing use of contemporary »screen media« and the low degree of recognition of the relevance of the sense of touch to describe a space. We could, in fact, argue that there is a kind of linguistic shackle in questioning something we do not speak about consciously but »just feel«. The same happens i.e. with the question about humidity. It is obvious, that the higher degree of positive answers belong to very circumscribed questions as the one about the description of colours. Nevertheless, these figures could be a kind of recognition of the little attention paid in general to the development and enrichment of space perception in our school programs and/or in the way their performance is made. These results are a good starting point for the reflection about the implementation of concrete strategies in the field of Art education, especially in the context of primary and secondary school reform in Slovenia.

Conclusion

As B. Musil (2001, 357-360) affirms, the sensorial experiences of sight, hearing, touch and their combinations are limited in cyberspace. In fact, the evolution of media technology tends to present things as realistic as possible but any physical interaction is not possible, as well as the inclusion of non verbal signs, like body language or the »real« context of the sensorial experience. F. Dyson (1998, 30) also affirms that new technologies are constructing a particular kind of viewer that is »screen based«. This definition can also be extended (at least partially) to contemporary students.

This is, in short, the reason why we can affirm that art education at the beginning of the twenty first century faces new, paradoxically opposed challenges: on one hand, it isnecessary to improve experiences using »new media«. They facilitate spacial visualization and operations with complex shapes. This basic characteristic led to the developement of new ways of understanding space i.e. in the field of architecture. On the other, it is obvious that a global sight on the educational process of art education demands the inclusion of a new, specific way of accurate evaluation of three dimensional-haptic activities that would enable students to experience the characteristics of materials like texture, toughness, temperature, elasticity, flexibility, plasticity, porosity, etc. which are neglected by »screen media«. In fact, the understanding of past as well as contemporary art products demands a complexity of rich experiences which is one of the principal objectives of school education at all levels.

If we have a look at history, we can affirm that the transformations in the conditions of intellectual life that took place at the end of the 15th century were decisive for western civilization and meant, among other things, radically new ways of communication. Visuality played and important role as it does nowadays. As we tried to

discuss in this paper, the present time means a new turn. And we are, as teachers, highly involved in it …

Figure 1: The graph shows the relation between the number of positive and negative answers considering the eleven questions.

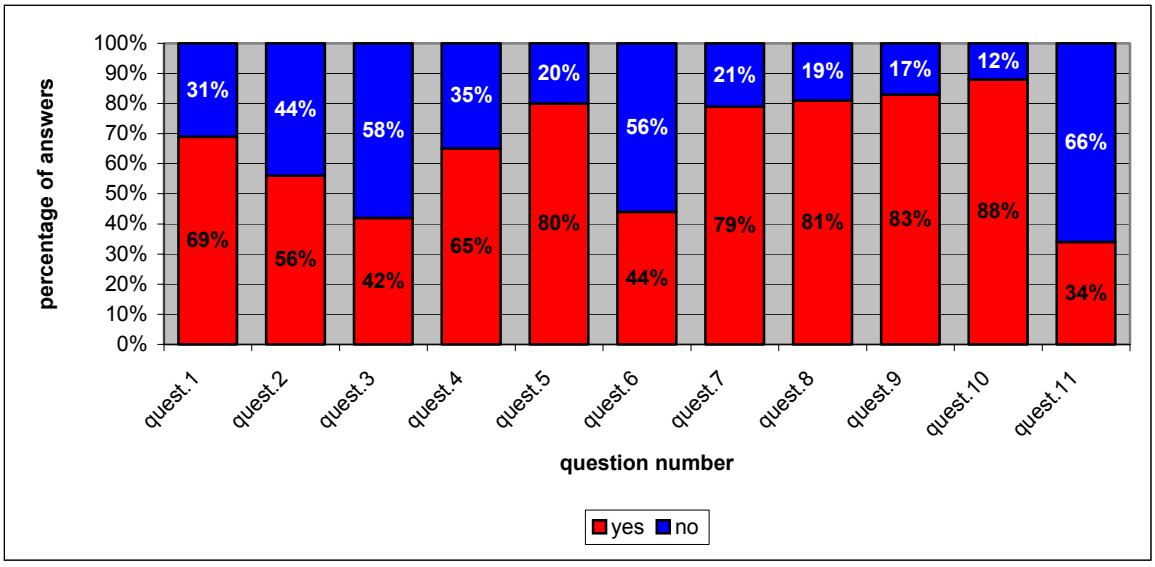
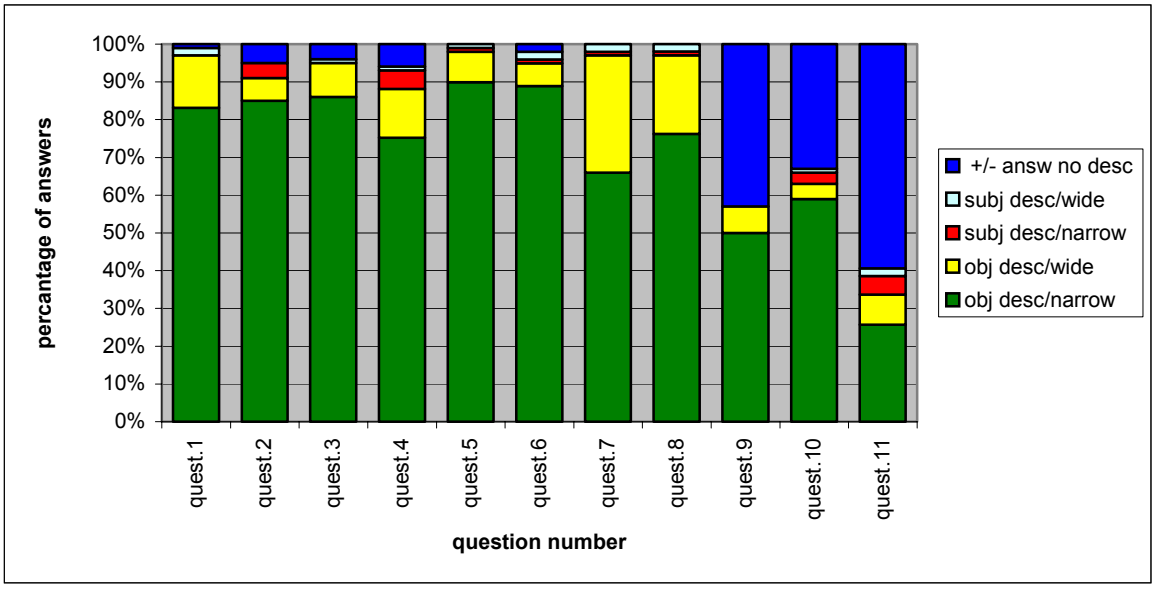


Figure 2: The graph shows the relation between the different evaluations, considering the eleven questions and the clasification from 1 to 5.



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UMJETNIČKA NAOBRAZBA: O PROSTORNOM ISKUSTVU STUDENTA U SUVREMENOM SVIJETU VIZUALNIH MEDIJA

Protekla dva desetljeća predstavljaju revoluciju u svijetu vizualnih medija. Mnoge bitne posljedice tih promjena dogodile su se zahvaljujući medijima koje studenti svakodnevno »koriste«, kao na primjer, televizija, video i kompjutor. Zahvaljujući njima možemo govoriti o posebnom iskustvu prostornog predstavljanja koje svaki učenik «donosi» u razred. Temelji se na činjenicama kao sve veći broj »letimičnih« slika, mehanička jednostavnost i široke mogućnosti u rezoluciji različitih tehničkih problema. Uzimajući to u obzir, došli smo do zanimljivih promišljanja na osnovu rezultata istraživanja provedenog među učenicima prvoga razreda srednje škole u Sloveniji. Učenici su morali odgovoriti na pitanja tako što su slijepom prijatelju opisivali svoje najdraže mjesto. Pitanja su se temeljila na različitim osjetilima za percepciju prostora i prostornih obilježja stvari. Rezultati istraživanja pokazali su, između ostaloga, da je većina uključenih učenika informaciju koja se odnosila na osjet dodira smatrala nebitnom. Na temelju tih podataka pokušali smo razumjeti kontekst umjetničke naobrazbe na početku 21. stoljeća te ocrtati izazove s kojima se ona suočava u određenom povijesnom trenutku.

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Tonka Tacol
University of Ljubljana
Faculty of Education

DIDACTIC FOUNDATIONS FOR VISUAL ART EDUCATION

This article presents a research project about efficient teaching and learning in the earliest period of the visual art education process. Such teaching and learning should be both a creative and constructive way of mental and motor activities. A teacher is supposed to provide his students a holistic – emotional, psychomotor and cognitive – visual development. The organisation of lessons should enable students to learn about the visual art and other concepts through their own activities when experiencing objects and phenomena in nature and their environment, which would also provide them with potential for the verbal definition of such phenomena while they spontaneously produce their own creative visual art. Problem solving teaching technique includes learning about visual art and other concepts as well as a creative visual art expression. It is necessary for students to understand visual art signs as holders of meaning and to be able to interpret them as this enables a successful information change and interaction between a teacher and a student. The familiarity with visual art concepts and the capability of visual expression are inseparable. Therefore, students' activities at problem solving visual art teaching should not be left to their talent, intuition and spontaneity only, but should be guided to acquiring knowledge about visual art concepts, because cognition is the condition for the rearrangement of visually perceived stories to meaningful visual signs with various materials and tools. This leads students to satisfaction, new discoveries, depiction of their own feelings and wishes, and upgrade of their experience.

Introduction

Modern times could be described as times of visualisation. This is the time when visual information prevails to the verbal one. For the understanding of this information one needs to know the verbal and visual signs. The development of such abilities should be ensured by the visual art education. The innate abilities do not suffice and need to be developed. Therefore, a teacher should enable gradual learning, understanding, experiencing and use of visual signs. That is why it is very important for all students to enrich the development of their manual skills and orientation to experience with gradual understanding of visual art concepts and rules of visual signs' use within the visual art education process. These abilities should be already developed gradually and naturally (Matthews, 1999) at the pre-school period and their importance should be additionally emphasised in the grammar and high school (Berce, Golob, 1993).

Today's grammar school visual art education mostly develops manual skills with use of different materials and tools and experiencing when depicting visual motifs, while the students' cognitive development is neglected. Therefore, the continuous development of visual perception, presentation and expression that is appropriate for the stage of the students' development should be included in the teaching and learning process of visual art education (Barries, 1992). The balance between the abilities for verbal and visual expression should be established (Muhovič, 1986). Considering this, the teaching and learning as a multivariate activity that synergically activates both brain hemispheres of the student and allows for different affective, motor and cognitive changes should be already used with the youngest of students. The most successful methodical condition for achieving such changes – experiencing and activating emotional, psychomotor and recognition functions at students' independent visual art activities – is the problem solving teaching technique, where visual art education tasks

are designed as problems by the teacher and are solved with specific visual art education work methods (Tacol, 1999).

The research purpose and pedagogical research methods

The theory and practice of the problem solving teaching deal with the problem of the holistic and accordant development of students in visual art - in the affective, psychomotor and cognitive field, of realisation and evaluation of the educational goals, as well as the use of appropriate work methods.

My assumption was that within the existing theory and practice of the problem solving visual art education in grammar school there are still many problems considering the correct pedagogic-didactic realisation, which makes it professionally questionable. The update of the visual art education required such a teaching technique that enables the accordant cognitive development and influences the development of manual skills as well as the positive emotional-social change, values and attitudes. Basic scientific foundations for the students' cognitive development had to be set and visual art education had to become part of the pedagogic-didactic approach of the problem solving teaching technique in grammar school by realising the goals as defined in Bloom's taxonomy (Bloom, 1956).

The research purpose was as follows:

- to test the problem solving teaching technique in view of the cognitive field as a whole,
- to test the efficiency of the problem solving teaching technique in view of individual categories (knowledge, understanding and use, analysis and synthesis, evaluation) as a field in terms of expression with the basic visual expression – a line and a point (drawing) and a more demanding one – volume (sculpture).

I used an experiment with departments for comparison. The experiment factor had two modalities:

a) ES – problem solving teaching technique,
b) KS – non-problem solving classic teaching technique.

The research included 280 students of the third grade of Slovenian grammar schools, aged ca. 9. The sample included urban and rural area schools and special attention was paid to the teachers' equal professional background (Sagadin, 1977). The practical realisation of the experiment (two drawing and two sculpture tasks) took place in the school year 1999/2000.

Two questionnaires were used:

- test of initial cognitive achievements,
- evaluation scale of final cognitive achievements.

Questionnaires were composed in compliance with the classification of subcategories in the cognitive field. The evaluation scale contained statements with 5-level Likart scales for each of the four categories. The validity and reliability of questionnaires based on the separate analysis made by professionals for questionnaire compositions and on the consideration of suggestions made by technicians – grammar school and visual art education teachers. The objectivity of evaluation was ensured with closed questions and with the analysis of teachers as evaluators who were trained for evaluation by the given scale in special workshops.

The evaluation scale content of questions for subcategories of the cognitive field included:

KNOWLEDGE

The student's recognition of provided drawing and sculpture concepts, his ability to describe models in nature and the environment, ability to describe a certain visual motif, ability to use drawing and sculpture concepts with visual art of artists or students.

UNDERSTANDING AND USE

The student's understanding of drawing or sculpture concepts and his ability of their use with drawing or sculpture expression – finding an appropriate motif, choosing appropriate drawing or sculpture material and tools, correct execution of the drawing or sculpture technique, understanding the evaluation criteria and evaluating the newly made visual art works.

ANALYSIS AND SYNTHESIS

Student's abilities to discover and connect special characteristics of provided drawing or sculpture concepts – integration of the acquired knowledge (transfer) to the solution of the drawing or sculpture task, analysis of the visual motif, analysis of the drawing or sculpture technique process, analysis of the drawing or sculpture problem solution.

EVALUATION

Student's abilities to critically assess solutions of drawing or sculpture problems – the argumentation of the creative solution of the drawing or sculpture problem, the judgement on the correctness of use of the drawing or sculpture technique, expression of opinion about the original idea of the depicted motif, estimate on zeal and responsibility when learning drawing or sculpture concepts and when finding a solution to the problem.

The acquired data were processed at the descriptive and inferential level with univariate and multivariate statistical methods.

Results and interpretation

The aim of the research was to confirm the organisation of the problem solving education at drawing and sculpture design in grammar school and to prove the necessity of the students' cognitive development – learning drawing and sculpture concepts, developing abilities to describe these concepts and using them at drawing and sculpture expression.

The comparison of the prevailing theories on teaching techniques and the effects they show in the students' art work with modern, not as established theories on learning drawing and sculpture concepts as a condition for harmonic and holistic drawing and sculpture development over a problem task resulted in the following:

1. We confirmed that students who took part in the problem solving teaching reached higher levels in the entire cognitive functioning – knowledge, understanding and use, analysis and synthesis and evaluation – than their peers who were taught in the classic way. The cognitive development of students influences a successful emotional, social and aesthetic development as well as psychomotor development of manual skills.

   The problem solving teaching technique enables students to learn successfully, which is shown by their recognition, understanding, judgement and memorising of drawing and sculpture concepts. Their ability to use these concepts at expression with drawing or sculpture was confirmed, which also enables students to develop higher cognitive functions, such as analysis, synthesis and evaluation.

2. Findings in individual categories of the cognitive field only reaffirmed the success of the problem solving teaching technique for drawing and sculpture design. These categories are knowledge, understanding and use, analysis and synthesis and evaluation:

a) The problem solving teaching technique enables students to learn – recognise drawing and sculpture concepts. They judge, organise and upgrade them with observing objects and phenomena in nature, environment and in art.
b) The problem solving teaching technique enhances the understanding of gist of drawing and sculpture concepts and their relations that students gain through their teacher within the work tools and through the observation of examples in nature. Better results at understanding drawing and sculpture concepts are proved verbally and with students' drawing and sculpture expressions, which also prove their ability of use. With drawing and sculpture expression they show they understand processes of drawing and sculpture techniques.
c) The problem solving teaching technique enhances observation, discovery and analysis of line and spatial values and processes of drawing and sculpture techniques. Students are also better at connecting concepts from other fields with those from drawing and sculpture, at distinguishing the important and unimportant parts and at combining drawing and sculpture concepts with their own recognition – their creative ideas. They are also better at analysing the relevant drawing and sculpture problem in their own works, in the works of their peers and artistic works.
d) The problem solving teaching technique enhances critical evaluation of students' own drawing and sculpture knowledge that is referring to the problem task. They are more independent at finding original solutions to the drawing and sculpture tasks. They also successfully define a correctly performed drawing and sculpture technique and describe the independence and directness of the drawing and sculpture expression.

Tested and described differences were based on statistically important differences and were acquired at a large enough sample. Therefore they can apply to the entire multitude without significant deviancies. Although this research included only two design areas, these results can serve teachers as an application guide for all the other design areas as well.

Conclusion

This research has found a way how to enhance the entire harmonic visual development of students at visual art education. We confirmed that students in grammar school should not only be developed in the affective and psychomotor area but also in the cognitive one. That is why knowledge about visual art concepts (cognitive area development) should not be omitted. The prevailing theory that visual art education should develop motor skills, imagination and emotions which are supposed to present the entire visual development is rejected. That is why this research discovered and proved students' abilities for learning visual art concepts while taking into consideration the visual development abilities. We proved the belief about the harmonic development of students' visual abilities to be wrong. The answer lies in the visual problem task that presents a starting point for visual expression, visual art concept or a visual motif (that enables the recognition of the foreseen visual art concepts).

The experiment results show that we should suggest the establishment of the problem solving teaching technique in visual art education in the earliest education periods. These research results can guide teachers to start with the problem solving

teaching technique, where teaching and learning present both a creative and a constructive way of mental and motor activities. Foundations for such teaching and learning are already incorporated in the visual art education curriculum.

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DIDAKTIČKE OSNOVE U NASTAVI LIKOVNOG ODGOJA

Ovaj članak predstavlja istraživački projekt o uspješnoj nastavi i učenju u najranijoj etapi procesa učenja likovne umjetnosti. Takva bi nastava i učenje trebali biti i kreativan i konstruktivan način umnih i motoričkih aktivnosti. Učitelj bi učenicima trebao pružiti jedan holistički – emotivni, psihomotorni i kognitivni – vizualni razvoj. Organizacija nastave trebala bi osposobiti učenike da uče o likovnoj umjetnosti i drugim konceptima kroz vlastite aktivnosti dok doživljavaju predmete i pojave u prirodi i vlastitu okruženju, što bi im također pružilo mogućnost za verbalnu definiciju pojave prilikom spontanog stvaranja vlastite likovne umjetnosti. Rješavanje problema kao tehnika učenja uključuje učenje o likovnoj umjetnosti i drugim konceptima kao i kreativno izražavanje likovne umjetnosti. Učenik mora razumjeti znakove likovne umjetnosti kao nositelje značenja te biti sposoban tumačiti ih, budući da se time omogućuje uspješna razmjena informacija i interakcija između učitelja i učenika. Nerazdvojivo je poznavanje koncepata likovne umjetnosti i sposobnost vizualnog izričaja. Stoga se učenikove aktivnosti prilikom poučavanja rješavanja problema u likovnom odgoju ne smiju prepustiti samo talentu, intuiciji i spontanosti, već bi ih se trebalo usmjeravati na stjecanje znanja o konceptima likovnoga odgoja, budući da je znanje uvjet kodiranja vizualno percipiranih priča u smislene vizualne znakove s različitim materijalima i oruđima. Na takav način učenik postiže zadovoljstvo, nova otkrića, može opisati vlastite osjećaje i želje te unaprijediti svoje iskustvo.

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Janja Črčinovič Rozman
University of Maribor
Faculty of Education

EFFECTIVENESS OF DIFFERENT METHODS IN DEVELOPING THE FEELING FOR COMMON METERS

The article presents some attempts of teaching and learning music by the help of movement. In the empirical research we wanted to find out the influence of movement on perception of music metre. 411 pupils participated in the research; they were six to nine years old, coming from Slovenia. The pupils were divided into two groups. One group was listening to two music pieces of different kind, sort and style for three weeks and it was trying to find out the time measure. The other group was first moving and perceiving the metre, while listening to the music pieces, and then it gave its rational judgement about them. The measurements, which referred to the perception of metre of ten music fragments before the three-week experiment and after it, showed the positive influence of movement on the perception of music metre. Some differences in the ability of recognition of the triple and quadruple metre, and different lesson effects on the improvement of the mentioned abilities, also appeared. With the lessons we have improved the ability of recognition of the triple metre, which was causing more problems than the quadruple metre. With identifying the measure, girls were more successful initially, but in the final measurements boys caught up with them.

Introduction

"The Metre is a special rhythmical order of a composition which lies upon the proportion between the heavy and light periods in a measure." (Glasba, Leksikoni CZ, 161) It can be represented by measures, bigger measure groups or just the basic measure size. It is a conceptual structure of music. Distinctive, for the major part of music, is a regular and constant rhythmical pulse. For grownups, particularly teachers of music, the regular pulse seems so simple that they usually pay little attention to it. The result of this may be seen later, when children are having problems in understanding the metre and rhythm and are unable to recognise the rhythmical order of a considerable number of grownups. Good teachers of music and dancing are aware of the importance of being able to feel basic stress in music and they perceive it as fundamental rhythmical competence. In observing a group of singers, instrumentalists or performers of locomotorical rhythmical motive activities, we establish that the bigger the number of individuals who feel the common pulse, the better the group-experience or performance.

Metrical abilities belong into the concatenation of rhythmical abilities, which are a part of elementary music abilities that in the greatest measure develop between the age of six and nine. In a later period their development is less successful or, in the opinion of some, impossible. Because of the above mentioned reason, it is necessary that proper attention is given the development of rhythmical abilities in the above mentioned time period of childhood.

Numerous music pedagogues, like Orff, Kodály and Dalcroze, spoke in favour of movement as it being the most important step in the process of music tuition (Rohwer, 1998). The pioneer of music teaching and learning by the help of body-movement was the Swiss music teacher Emile Jacques-Dalcroze (1865-1951), who founded an institute in Genevé which is still working today. His theory is presented in two books: *Rhythm, music and education* (1921) and *Eurhythmics, art and education* (1930). "Dalcroze found that unless the learner experiences aspects of music by body

movement, the music that individual later performs will be mechanical, without feeling, and the expressive responsiveness essential to genuine musicianship may never develop. His followers claimed that Dalcroze's Eurhythmics developed the whole child, meaning the good physical development and muscular control, mental awareness, social consciousness, and emotional health as well as understanding and appreciating music. The body and mind are to respond to what the individual hears and feels." (Nye, Nye, 1985, 202).

Carl Orff (1895-1982), German composer and pedagogue, agreed with Dalcroze`s viewpoints of rhythm and musical development. He developed an educational strategy which is based on spoken rhythms of children's names and old sayings – with their help a creative, improvisational process of teaching can begin. Orff believed, the same as Dalcroze, that learning to play instruments has to begin after one has acquired the skills of listening, movement at listening to music, making up and playing the basic rhythms, making up and singing the basic melodic motives and intervals (Nye, Nye, 1985, 204).

Zoltan Kodály used movement as a natural accompaniment to music. He encouraged children in altitude and rhythmical elements of music. (Shiobara, 1994, 113)

Empirical research

Determination of the research problem, aims and hypotheses

With the desire to ascertain the power with which motion influences the development of metric abilities of children in the period of the most intense development of simple music abilities, we have undertaken an empirical research. Our goal was to establish what the perception of metre was with pupils who for some time every day were motional active when listening to music in class, and pupils who were in contact with music without additional metrical movement encouragement. We were also interested in the different perception of metre according to sex and the type of metre.

We anticipated to ascertain a bigger progress with pupils who were moving when listening and performing music, when compared to those who day after day tried statically to establish the music's metre. We expected the pupils to be similarly successful at stating the triple and quadruple metre and that there would be no bigger difference in the effectiveness of doing exercises with boys and girls, for the development of musical abilities is not dependent on sex.

Methodology

In the research of the perception of the metre we used the experimental and the descriptive method. Twenty-five standard teachers, irregular students of the Faculty of Education, Maribor, Slovenia, took part in the research. They were performers of the inquiry and were carrying out the three-week-programme of developing the ability to percept the metre. The participating pupils were between the age of six and nine selected coincidentally on the schools of the region of Pomurje and were divided into the experimental and the control group. The pattern grasped 411 pupils altogether, from which 204 were male and 207 female. 212 students took part in the experimental group, of which 102 were boys and 110 were girls; in the control group there were 199 pupils, of which 102 were boys and 97 girls. All of the pupils were investigated simultaneously two times, first before the experimental programme and second after it. The test

comprised the finding of metre in ten musical fragments of different kind, sort and style; five were in the quadruple metre and five in the triple. Two works were from the field of popular music, five of classical and three were folk songs.

The musical fragments were taken from the following works:

1. Lion King: Can you feel the love tonight (4-partite measure)
2. J. Brahms: The Hungarian dance nr.5 (4-partite measure)
3. Slovene folk song: She washed the nappies (3-partite measure)
4. Swedish folk song: If you're happy (4-partite measure)
5. L. Boccherini: Minuet (3-partite measure)
6. J. Strauss: On the beautiful blue Danube (3-partite measure)
7. W.A. Mozart: The little night music – 1. movement (4-partite measure)
8. J. Logan: Long lie the rivers (3-partite measure)
9. Slovene folk song: I've made something up – performed by the tambour orchestra (4-partite measure)
10. P.I. Tchaikovsky: Waltz from the ballet *The Sleeping Beauty* (3-partite measure)

The experimental programme comprised listening to two musical works of different kind, sort and style every day for some minutes. Students were moving while listening and then stating the metre. The movement comprised walking, jumping, running, clapping, snapping fingers, simple dancing, beating time and similar activities. The control programme comprised motionless listening to two works and stating the metre. In both groups the number of works in triple and quadruple metre was numerously equalized.

The results of the processing and interpretation

The measurements of the ability to percept metre for the control group are presented in Table 1 and for the experimental group in Table 2.

In the tables 1 and 2 an analysis of frequency and per cent frequency of correct answers and their means are given in such a way, that the data is stated separately for boys and girls and for both sexes together, considering initial and final judgement. Correct answers in the tables are grouped also according to the elementary measure of the musical fragment.

Table 1

Control group	initially						finally					
	boys		girls		together		boys		girls		together	
Quadruple m.	f	f%	f	f%	f	f%	f	f%	f	f%	f	f%
1. example	51	50	56	50,9	107	50,5	63	61,8	65	59,1	128	60,4
2. example	59	57,8	69	62,7	128	60,4	64	62,7	64	58,2	128	60,4
4. example	56	54,9	71	64,5	127	59,9	63	61,8	72	65,5	135	63,7
7. example	56	54,9	47	42,7	103	48,6	62	60,8	61	55,5	121	57,1
9. example	59	57,8	76	69	135	63,7	62	60,8	68	61,8	130	61,3
Means	56,2	55,1	63,8	58	120	56,6	62,8	61,6	66	60	128,4	60,6
Triple metre	f	f%	f	f%	f	f%	f	f%	f	f%	f	f%
3. example	55	53,9	51	46,4	106	50	65	63,7	58	52,7	123	58
5. example	51	50	53	48	104	49	58	56,9	60	54,5	118	55,7
6. example	46	45	52	47	98	46	60	58,8	59	53,6	119	56

8. example	50	49	50	45,5	100	47	61	59,8	56	50,9	117	55,2
10. example	49	48	57	51,8	106	50	62	60,8	68	61,8	130	61,3
Means	50,2	49,2	52,6	47,7	102,8	48,4	61,2	60	60,2	54,7	121,4	57,3

Means of Quadruple metre + Triple metre *initially* = 52, 5%, *finally* = 59% (6, 5% bigger)

Tabel 2

Experimental group	initially						finallly					
	boys		girls		together		boys		girls		together	
Quadruple m.	f	f%	f	f%	f	f%	f	f%	f	f%	f	f%
1. example	46	45,1	49	50,5	95	47,7	66	64,7	61	62,9	127	63,8
2. example	53	51,9	53	54,6	106	53,3	73	71,6	69	71,1	142	71,4
4. example	58	56,9	64	66	122	61,3	71	69,6	79	81,4	150	75,4
7. example	55	53,9	49	50,5	104	52,3	65	63,7	68	70,1	133	66,8
9. example	56	54,9	52	53,6	108	54,3	70	68,6	73	75,2	142	71,4
Means	53,6	52,5	53,4	55	107	53,8	69	67,6	70	72,1	138,8	69,8
Triple metre	f	f%	f	f%	f	f%	f	f%	f	f%	f	f%
3. example	43	42,2	52	53,6	95	47,7	64	62,7	67	69	131	65,8
5. example	51	50	56	57,7	107	53,8	58	56,9	62	63,9	120	60,3
6. example	45	44,1	46	47,4	91	45,7	62	60,8	67	69	129	64,8
8. example	49	48	50	51,6	99	49,7	64	62,7	58	59,8	122	61,3
10. example	48	47	54	55,7	102	51,3	72	70,6	67	69	139	69,8
Means	47,4	46,3	51,6	53,2	98,8	49,6	64	62,7	64,2	66	128,2	64,4

Means of Quadruple metre + Triple metre *initially* = 51,7%, *finally* = 67,1% (15,4% bigger)

It is evident from the stated results that students from the *control group* initially correctly stated the metre in 52, 5% and finally in 59%. The number of correct answers, therefore, increased for 6, 5%. The ascertained difference between the correct answers was even greater in the *experimental group*. From initial 51, 7% it increased to 67, 1% and amounted to 15,4%. The pupils from the control group initially judged the metre of the musical fragments a little more accurately, but by a great deal fell behind the correct answers of the experimental group in the final assessment.

As expected, there was certain oscillation present in the number of correct answers. This is also visible in the average of correct answers for compositions in quadruple and triple metre. For boys and girls from the control and experiment group the triple metre presented more trouble than the quadruple, for in both groups there were initially and finally more correct answers connected to the quadruple metre than the triple. In the control group the number of correct answers connected to music in the quadruple metre increased from the initial 56, 6% to the final 60, 6%, the growth was therefore 4%, at music in the triple metre it increased from 48, 4% to 57, 3%, which is a 8, 9% improvement. Similar tendencies were present and even more distinctive in the experimental group, where the number of correct answers about music in the quadruple metre raised from the initial 53, 8% to 69, 8%, the growth being 16%, and in the triple metre from 49, 6% to 64, 4%, which means a 14, 8% better result.

The comparison of the number of correct answers between boys and girls shows, that the lessons had a more positive effect on boys than on girls. As regards the initial and final judgement of metre, boys made a bigger progress. Initially girls were much better in judgement than boys, but finally boys drew nearer and in the control group even exceeded girls in the correctness of judging the triple metre. In the control group

boys on the average attained a progress of 8, 7%, girls of 4, 5%; in the experimental group the average improvement of results was 15, 8% with boys and 15% with girls. According to correctness of ascertaining the measure the differences are as follows: in the *control group* boys recognised the quadruple metre correctly by 6, 5%, the triple by 10, 8%, girls reached a progress of 2% at quadruple metre and 7% at the triple metre; in the *experimental group* boys recognised the quadruple metre 15, 1% more accurately, the triple 16, 4%, girls recognised the quadruple 17, 1% better and the triple 12,8% better.

Conclusion

With the help of the gained results of the executed empirical research we, succeeded to confirm the raised presumption that with movement accompanying the listening to music of different kind, style and sort, we can develop students` metrical musical abilities more efficiently than in the case of static listening to music and ascertaining the metre. The pupils belonging to the experimental group have (with the help of movement) improved their abilities of perception of the metre to a larger extent than their colleagues in the control group.

Our expectations about the equally successful establishment of the quadruple and triple metre did not come true, for the students of both groups had much bigger problems before the lesson with ascertaining the triple than the quadruple metre. The reasons for that might be sought in the bigger quantity of music consumed in quadruple than triple metre. The mentioned metre is more often used in songs the students often sing and in popular music they listen to. Especially in the triple metre, movement proved itself a very successful means for developing the perception of metre.

Initially, poorer results of boys improved strongly after the lesson and in the example of the experimental group rather equalised with the results of girls; in the control group boys even slightly exceeded girls in the successful perception of the triple metre. It is encouraging that a positive influence of systematic daily work came to light and that the cooperative pupils undertook the establishing of metre very seriously. They cooperated with pleasure and were delighted about every success.

The use of movement in developing rhythmical abilities comprises the holistic approach, because pupils respond with their bodies and minds to what they hear and feel. Such a way of developing abilities, which comprises the sensitive responses to music, is more efficient than the one which develops only mental images.

With the present research and its results, we, amongst other things, tried to expose different possibilities of developing metric abilities and ascertain their efficacy. Our intention was also to stimulate teachers to more objective ways of checking the success of their work and observing and describing the musical progress.

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UČINKOVITOST RAZLIČITIH METODA U RAZVIJANJU OSJEĆAJA ZA OSNOVNE GLAZBENE MJERE

Članak predstavlja neke pokušaje nastave i učenja glazbe uz pomoć pokreta. Empirijskim istraživanjem htjeli smo doznati koliki je utjecaj pokreta na percepciju glazbene mjere. U istraživanju je sudjelovalo 411 učenika iz Slovenije starih od šest do devet godina. Učenici su bili podijeljeni u dvije skupine. Jedna je skupina tri tjedna slušala dva glazbena djela različite vrste i stila te je pokušavala odrediti mjeru. Druga se skupina prvo kretala i uočavala mjeru dok je slušala glazbena djela, a tek je potom dala svoj racionalni sud. Mjerenja koja su se odnosila na percepciju mjere deset glazbenih fragmenta prije trotjednog eksperimenta i nakon njega pokazala su pozitivan utjecaj pokreta na percepciju mjere. Također su se pojavile razlike u sposobnosti prepoznavanja trodobne i dvodobne mjere te različiti učinci poboljšanja spomenutih sposobnosti. Tijekom nastave popravili smo sposobnost prepoznavanja trodobne mjere, koja je uzrokovala više problema od dvodobne. U početku su, pri prepoznavanju mjere, djevojčice bile uspješnije, no u posljednjem mjerenju dječaci su ih stigli.

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