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# New Educational Review

Dear Authors and Readers,

Taking up the honourable function of the Honorary Editor of "The New Educational Review", I hope that my research output as well as contacts with outstanding representatives of pedagogical sciences from different countries of the world will contribute to the growth of the already high rank and good reputation of the journal, which it enjoys in the world of science. That is why I am going to facilitate the discussion on the essential problems of education and upbringing in this journal, at different levels and stages of these processes, paying particular attention to the most important and, at the same time, topical problems of the contemporary world. First of all, I rate among them: 1) handicapping the school start and educational chances of children and the youth; 2) action aiming at an increase in education and upbringing quality, highlighting the so-called mediocrities, school misfortunes as well as educating and upbringing outstandingly talented individuals, and also children and the youth with different kinds of disabilities; 3) the development of methods and means of education, based on the most modern technology, including so-called e-learning, as well as 4) aiming to create such an education system that would enable everybody to learn the contents that are necessary or desirable for them in the most convenient time as well as with the use of methods and means recognized as optimal for them. So far such a system has been considered as utopian by educators. It ceases being one thanks to contemporary developments in science and technology, including pedagogical sciences.

*Czesław Kupisiewicz*

Warsaw, February 2012



## Editor's Preface

The first number of The New Educational Review in 2012 is the twenty seventh issue of our journal since the start of its foundation in 2003. In this issue there are mainly papers from: the Czech Republic, Malaysia, Poland, Romania, Serbia, the Slovak Republic, Spain, Taiwan, Turkey, and the United Kingdom because our journal is open for presentation of scientific papers from all over the world.

In the present issue the Editor's Board have proposed the following subject sessions: General Pedagogy, Social Pedagogy, Technology of Education, Pedeutology, Special Pedagogy, Chosen Aspects of Psychology and Review.

The subject session "General Pedagogy" consists of three articles. The article by Mladen Radišič and Aleksandar Nedelikovič present 5C (Creation, Cooperation, Context, Creativity and Communication) business case study solving methodology. This methodology is applicable to various real life business problem and it focuses on completely practical structure. The study presented by Hamza Abed AL-Karim Hamed and Ahmed Mohy AL-Eddin AL-Kelani aims to reveal the occurrence of thinking levels questions in the books of Sharea (Islamic religion) in the Sharea schools that belong to the ministry of religious affairs and holy places in Jordan for the academic year 2008–2009. Longitudinal investigation of nursing students' self-directed learning readiness and locus of control levels in problem-based learning approach is presented by Zekiye Cetinkaya and Hatice Sen.

The subject session "Social Pedagogy" starts with an article by Anna Nowak, in which she presents the opinions and assessments of experts/practitioners working with handicapped people on the causes, fields of social exlusion, factors facilitating and impeding their social inclusion. Quality of life in childhood with congenital heart disease is the subject of an article by Cristina Salmerón and Carmen Ponce. In her article Agnieszka Kozerska describes the results of research on the relationship between the way in which students of pedagogy understand self-education and perform their social roles. Krzysztof Rubacha focuses on the question concern-

ing the significance of the differences between the statistical average of parents' sense of pedagogical efficacy with regard to their level of gender role development. The article by Beata Dyrda presents the results of research conducted with the participation of professionally active school educators, working in primary and lower secondary schools in the province of Silesia, which focuses on supporting of gifted students. In their article Larisa Nikitina and Fumitaka Furuoka focus on the attitudes of host country students towards their international peers.

In the subject session "Technology of Education" Radim Badošek, Tereza Kimplová and Jana Mynářová summarize the extensive research into a technical competence and technical profession preference of the senior primary grades. In their article Julio Ruiz Palmero and José Sánchez Rodríguez describe the results of impact of education policies to incorporate ICT as innovative agents in the classroom. Bing-Yuh Lu and Ming-Li Tung show the perspectives on the Open Educational Resources aided learning in a computer aided classroom. A study of incorporating multimedia technology in Power Point on demand is presented by Yuh-Tyng Chen. The main purpose of the study presented by İbrahim Bilgin, Yunus Karakuyu, Erdal Tatar and Abdullah Çetin is investigation of the effects of students' teams- achievement division, team assisted individualization and traditional instruction on students' conflict resolution and empathic tendencies. Self-regulated learning and mathematical problem solving are the subjects of the studies carried out by Iuliana Marchis. In his studies Devrim Üzel determines the attitudes of primary school students towards mathematics in WebQuest based learning. Barış Çaycı describes the effect of technology based course material use on the science teaching self-efficacy beliefs of pre-service elementary teachers. The study presented by Erol Ozcelik and Hasan Gurkan Tekman examines the effects of graph type, conceptual domain and perceptual organization of information on graph comprehension.

In the subject session "Pedagogy" the article presented by José Sánchez Rodríguez and Julio Ruiz Palmero with the use of case study characterizes an implementation of a peer assessment in higher education. Erika Novotná and Milan Portik describe the teaching styles of teachers educating Romany pupils. Saedah Siraj, Rahmad Sukor Ab. Samad and Abdulla Ziyadh present the role of ICT in school management of Maldives. The purpose of the study carried out by Adem Duru, Murat Peker and Osman Birgin is to examine the attitudes of pre-service teachers toward the use of the computer in a mathematics classroom. In their studies Fatih Bektaş and Mehmet Fatih Öçal determine the school culture's effect on job satisfaction based on primary school teachers' perception.

The chances of people with disabilities for continuing education and opportunities of employment in the context of the key competences level of vocational school-leavers are characterized by Iwona Chrzanowska within the framework of the subject session "Special Pedagogy". The next text by Beata Jachimczak describes education at a high level in life plans of schoolchildren with disability who complete their education at a vocational level.

The subject session "Chosen Aspects of Psychology" consists of one paper by Irena Pilch, in which she examines the relationships between the level of spouses' Machiavellianism and tendency to use constructive and unconstructive problem-solving strategies in marital conflicts.

In the subject session "Review" we publish two reviews. Soňa Kariková reviews a monograph by Bronislava Kasáčová, Simoneta Babiaková, Mariana Cabanová, Ewa Filipiak et al., entitled "Teacher in preschool and elementary stage of primary education. Professiography in a Slovak-Czech-Polish study" edited by Matej Bel University in Banská Bystrica in 2011. Zbigniew Ostrach presents a review of a book by Barbara Skalbania entitled "Pedagogical diagnostics. Selected research areas and practical solutions.", published in 2011 by IMPULS Publishing House in Cracow.

We hope that this edition, like previous ones, will encourage new readers not only from the Middle European countries to participate in an open international discussion. On behalf of the Editors' Board I would like to invite representatives of different pedagogical sub-disciplines and related sciences to publish their texts in *The New Educational Review*.



2021 New  
E|Educational  
Review

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**General  
Pedagogy**



Mladen Radišić,  
Aleksandar Nedeljković  
Republic of Serbia

## **5C Model – Business Case Study Solving Methodology**

### **Abstract**

The paper presents 5C (Creation, Cooperation, Context, Creativity and Communication) business case study solving methodology. This methodology is applicable to various real life business problems and it focuses on completely practical structure. It has been developed through the learning by doing practice of Industrial Engineering and Management students at the University of Novi Sad, Republic of Serbia, during many national and international student business case study competitions for many years. Together with their mentors, students improved their own study program and accepted this useful concept as their basic tool when preparing for tasks and problems they are facing.

*Key words: 5C model; case study; team work; students.*

### **1. Introduction**

In almost every modern university curriculum worldwide one can find well structured and defined business and management programs. These programs rely on close cooperation between teachers, business people and students. Such cooperation can be expressed through very intensive student internships. As internship requires three-way communication within the educational institution, the student intern and the business or industry worksite supervisor can provide real world experiences for students in academic programs (Henry et al, 2001). Students increasingly see internship less as a vehicle for augmenting their education and more as a means of gaining a competitive edge in the marketplace

(Cannon, Arnold, 1998). Some authors clearly evidence in their work that there are significant early career advantages for undergraduates with internship experience (Gault et al, 2000). By experiencing firsthand the conditions and nuances of the workplace, interns acquire a realistic perspective of employer expectations and thus gain knowledge about the habits, skills and attitudes needed, valued, and rewarded (Parris, Adams, 1994).

Another form of expressing aforementioned cooperation is through a business case study solving approach. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly defined (Yin, 2003). Certain authors (Zainal, 2007) state that case study research, through reports of past studies, allows for the exploration and understanding of complex issues. This fact is of crucial importance for students who are studying business and management, since they have to have an in-depth understanding of the business world they are about to enter after their graduation. Indeed, the literature reveals the application of the case study method in many areas and disciplines, such as sociology (Grassel, Schirmer, 2006), law (Lovell, 2006) and medicine (Taylor, Berridge, 2006). Nevertheless, there are also many other areas that use case study methods extensively, particularly in government, management and in education.

This paper systematically presents developed business case study solving methodology with a special focus on:

- analysis of the most important benefits of business case study solving for students (Section 2),
- 5C business case study solving methodology overview (Section 3),
- 5C business case study solving methodology amplification (Section 4),
- practical usage of the 5C model (Section 5).

Concluding remarks are given in Section 6.

### **3. Business case study solving benefits**

Business case study solving and participation in various student competitions is one of the most important side activities for university students during their education. There are many different perspectives that are covered by case study competitions students can benefit from:

1. **Education** – This is definitely the most important benefit for students. The reason for that lies in the fact that during practical work on case studies students discover new horizons and learn more in-depth about theoretical backgrounds

given during university lectures. Also, they are sometimes dealing with industries and sectors which are not a primary focus of their study fields and through those tasks they are able to implement their knowledge and realize the importance of multidisciplinary approaches.

2. **Challenge** – Problems in focus given by companies are very often challenging for students who have accepted case study solving philosophy. Although students cannot always understand the business technology and concepts of companies and cover all areas of expertise, it is enormously important for them to face that challenge and do their best in order to overcome existing problems and difficulties a company has failed in. In the very near future they are going to deal with their own business cases and this experience has a great impact on their personal dynamic progress.

3. **Team work** – It is practically impossible to imagine the modern business system without team work and cooperation of people employed in companies. Therefore, team work represents another important benefit for students involved in business case study competitions. As a team member, the student (future employee) shares success and failure with team mates and depends on other people and their contribution to the results.

4. **Creativity** – Working on business case study solving requires a certain level of creativity from students. In order to propose a qualitative solution that company representatives might take into consideration and implement in their business systems, students often have to think out of box and suggest daring ideas and solutions.

5. **Culture** – Both countries and business cultures are something proactive students are aware of if they are case study competitors. In their everyday business operations future employees will face many differences in cultures and case study is there to help them how to adapt quickly to a new and constantly changing business environment.

6. **Success** – Success is one of the best satisfactions businessman can achieve. Having that privilege to experience awards on their results, students have even more motivation for personal development and they accept business philosophy in the proper way.

The above-mentioned benefit perspectives are just the major ones. There are many other direct and indirect benefits. A very important issue based on the authors' experience shows that, from case to case, students upgrade the existing perspectives and find out new ones.

### 3. 5C Model overview

As both a theoretical and practical concept, the 5C business case study solving methodology helps students to understand the basics of successful team creation and work before their real professional experience in companies. There follows a very important step in problem solving philosophy: team creation and cooperation, concrete work on solutions for placed problems and presentation of proposed solutions. The 5C model is in correspondence with the basic theory of systems and, actually, it can be described as a typical systematic approach to problem solving procedures. As every structured system has its inputs, processes, outputs and feedback, the same logic is a background in the above-mentioned 5C model. It connects its elementary components in one best-practice model that can be implemented in various business situations. Without a strong bond with all other elements, each C is not useful or sufficient for successful results (Exhibit 1).

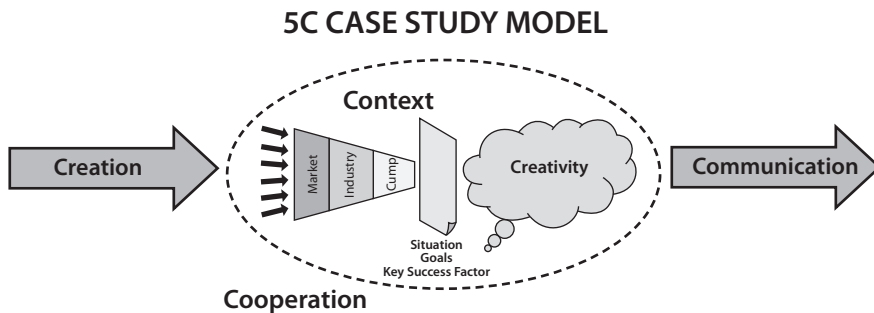


Exhibit 1. 5C Model Elements

The main idea of this model is to help students to understand team work functioning, as well as the importance of critical thinking and serious research during their studies. Those students are future decision-makers in companies and an understanding of basic business principles at the early stage of their career has enormous importance for them. Also, companies can benefit from supporting student case study competitions. When preparing some real life situations for business case study competitions, companies can easily realize what potential their future employees have.

## 4. 5C Model amplification

### 4.1 Creation

Being the first element of the 5C Model, Creation is an indispensable precondition for successful model implementation. One will say that, without any doubt, picking up the right team is a key to success. It has been confirmed countless times that a group of best individuals (the most successful students academically speaking) is not always the best team. The word team itself explains one of the core principles each member should be aware of – mutual confidence between team members.

Team role tests are very important for perfect team creation. There are many different tests for assessing team roles, but the most suitable one for this kind of team creation is the Belbin test. The use of the Belbin team-role self-perception inventory allows for the identification of particular team roles and the individual's preponderance for identified roles (Sommerville, Dalziel, 1998). Once the major team roles are defined, team members should get to know each other, before the concrete competition they are attending. In this sense, informal socializing is desirable in order for each team member to explain his/her personal advantages which are important for future joint work.

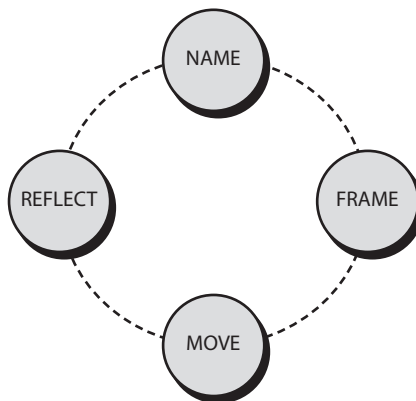


Exhibit 2. Schön cycle (Schön, 1983)

Thorough preparation is half way to success, thus it is needed to deeply analyze other solutions, also to innovate already existing team work methodologies and work on structure specialization. Discovering a focus in the subject of a competition, namely the specific industry a company comes from, in case it is known prior to the competition, might bring a competitive advantage.

It is also important to understand well the phases in problem solving, as presented in Exhibit 2. The famous Schön cycle is given as a good parallel to underline the importance of abstract thinking in problem solving activity. Schön cycle starts with a Naming phase, which is the key step in recognizing what the fundamental requirements are, i.e. establishing what needs to be done (Platts, 2003). Valkenburg and Dorst's study on student design projects (Valkenburg, Dorst, 1998) gives a more complete illustration of this mechanism of recognition at work. What their observations illustrate is that success has nothing to do with time. Success at the naming stage in a design project requires fluency in abstract thinking. If that fluency is present, then recognition of what matters in a situation is more or less instantaneous. If it is absent, then no amount of time will make the recognition possible. It is a genuine question of competence (Platts, 2003). In short, the important conclusion is that if teams have a high level of abstract thinking, which can help them to spot key issues in the problem and structure it in a way that can be tackled, they can proceed to next phases (Move and Reflect), where they will work on particular problem solving. However, if they cannot identify what the main problems are they will lose most of the time at the first two stages and at the end will not have enough time to develop their solution for the problem.

Finally, a very important aspect for successful finalization of the creation phase is preparation in an operational way. In order to be successful a team must work on their internal procedures concerning the case solving process. They should work on developing and upgrading methodologies for structuring the whole process. At every stage, from brainstorming to final presentation, they need to know exactly what to do, how to do it, and who will do it in order to avoid ad hoc process organization. Our experience has shown that this stage of team preparation is one of the key factors for obtaining the best results.

## **4.2 Cooperation**

As the second element of the 5C Model, Cooperation has several important aspects. In order to function successfully, a team has to have a team leader. Openness in communication appears to have a direct and significant impact on both team leader performance and team member satisfaction (Miles, Mangold, 2002). Team leader is a person who represents the whole team and who has the vision what the team's end results should be. Team leaders need to be made aware of the powerful impact that their actions (however subtle) may have on subordinates' willingness to transfer (Smith-Jentsch et al, 2001). When tough times come, the leader has to "cut the rope", especially if the team is "spinning

around” for a long time and a lot of time is spent on endless and not so constructive discussions.

Regarding other team members, it is always more than welcome to have additional team members willing to take the responsibility in case the team leader faces some problems. Nevertheless, everybody has to understand his/her own place within the team structure. It is important to bear in mind one of the core principles each member should be aware of – mutual confidence among team members. The team has to be unique during the competition, especially during the presentation.

Listening is the key issue which results in a better understanding. It is very important for a team if team members learn how to listen to each other and not to speak all the time. Our experience has shown that listening skills in a team improve with the time which the team spend together as well as the trust of the team members in each other.

### **4.3 Context**

Once the team members have established the basic principles of mutual work, they are ready to move on to the next phase of the 5C Model, Context. This phase starts when the case study solving team receives a business problem given by the company and when the competition officially begins. It has to provide answers to the following three questions:

- Where does the company stand?
- Where should the company be?
- What should be changed in order to achieve it?

At this point it is of crucial importance to understand the business logic of the company and core business values as well. Answering the above-mentioned will lead to a complete understanding of the problem given and, therefore, ensure solid team outputs. In order to achieve that, team members should analyze previous business operations of the company and forecast future trends in that industry. By defining future general trends, the team will not be led in the wrong direction when continuing their work. Analysis, shown in Exhibit 3, can be conducted at several levels, namely macroeconomic analysis, industry analysis and company analysis. Such an approach, which basically represents a reverse pyramid analysis or, as we call it, “funnel analysis”, is going to cover all the important aspects which should be taken into consideration.

It is good to know all the possible analyses and tools that can be used in this part, such as SWOT, PEST, Porter 5 Forces, Value Chain Analysis, etc. The key to success is to pick up and use useful analyses which will lead the team to the needed conclusions and add value to its presentation.

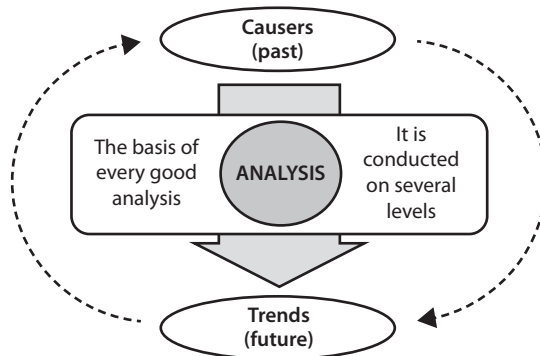


Exhibit 3. Analysis within Context

#### 4.4 Creativity

As mentioned in Section 3, creativity presents one of the business case study solving benefits for students. Creativity has its place in the 5C model and it starts with successful brainstorming. Brainstorming is probably the best of all the techniques available for creative problem solving (Rawlinson, 1986). At this stage, good team organization is necessary, in terms of physical micro environment adjustments, in order to organize effective brainstorming sessions. Team members should be positioned in the way that everybody sees everyone else (circle organization).

As for the work structure, the team leader is usually in charge of moderating the sessions. Several brainstorming circles are needed when everybody can express his/her own creative ideas for problem solving. Writing down the ideas must be a priority, since brainstorming sessions are often very dynamic and chaotic. It is also important to notice that everybody must participate and respect the principle of mutual and careful listening. It is highly recommended to stay focused during these sessions and not to waste precious time. At the end, the team should draw conclusions which will serve as the basis for ongoing work.

A team cannot expect to win if its members have conventional ideas, like everybody else in the competition. They have to have outstanding differences which will give them a competitive advantage. For that reason it is very important to produce solid ideas after brainstorming sessions. Still, creativity has its limits and the proposed solutions must be threefold – logical, real and acceptable for the judges.

## 4.5 Communication

Communication is the fifth element of the 5C model and it represents the final stage when the team is supposed to present its ideas and recommendations for the existing company problems. This stage is very sensitive since team members have to be careful during presentation in front of the jury members. Very often good ideas are not adequately presented and not properly understood.

Students have to be aware that there are certain expectations on the jury members' part and that they expect to see:

- What are the main issues in focus? (*problem statement*),
- Which are the most important ones? (*prioritization*),
- What are teams' ideas? (*work itself*),
- How to achieve it? (*recommendations*).

On the other hand, there are certain pitfalls during presentations, such as:

- Basic case data repetition,
- Uneven time distribution between team members (team must keep a balanced presentation),
- Too much information on slides (team must keep them simple and clear),
- Too long/too short presentation (team should not exceed the time limit).

The presentation itself has to include good and catchy ideas, it should be logical and with interesting content. Power point slides, transparency sheets or flip chart papers used should be visible. A casual and natural style of presentation is desirable, but still it should be highly professional. As for the presentation structure, it has to include logical parts and sections (Exhibit 4).



Exhibit 4. Recommended presentation structure

From our experience, in order to win, beside good ideas, well designed slides and fancy templates a team must create a good presentation atmosphere which will lead to a psychological understanding with judges. We have witnessed a number of good teams with great ideas who did not manage to win, in most cases because they just did not succeed in creating this kind of psychological relationship with the judges.

## **5. Practical usage of the 5C model**

Since the 5C model was introduced by the students of the Industrial Engineering and Management Department of the University of Novi Sad in 2005, it has been widely used at the national and international business case study solving competitions for a long time. Among other competitions, the TIMES (The Tournament in Management and Engineering Skills) competition is a place where students implement the model every year and compete with their European peers.

Today the Tournament in Management and Engineering Skills is considered the largest pan-European case study competition for Industrial Engineering and Management students. This prestigious, highly acclaimed event is the flagship project of the Europe-wide student organization ESTIEM – European Students of Industrial Engineering and Management. The tournament has been successfully organized for over sixteen years. Two qualification rounds are required to be selected for the Final, which takes place in an annually changing venue in Europe. Before reaching this final stage, all the participants take part in Local Qualifications at their home universities. The winning team is then allowed to take part in one of the six Semi-Finals, which are organized throughout Europe. The Final Week eventually brings together the winning teams from every Semi-Final to determine Europe's best Industrial Engineering and Management students.

TIMES' umbrella organization, the European Students of Industrial Engineering and Management, was founded in 1990, and it is the only Europe-wide network linking 65 Industrial Engineering and Management universities, representing more than 50,000 students in 25 countries. Industrial Engineering and Management is the integration of technological understanding and management skills and studies provide analytical capacities, engineering knowledge and practical management experience, which make IEM students able to do business while also understanding the underlying technology.

The concept of a management competition as an organization's activity dates back to the year 1992. The idea was to make the organization better known among professors and companies, and to encourage students to learn and master the increasingly important case method embraced by academics in business schools around the world. The first tournament was set to be held in 1994 and was immediately an absolute success. Since then enthusiasm for the competition has grown over the years and the tournament has been organized faithfully each year.

Each team consists of 3 or 4 talented students and the cases used are typical Harvard-type cases, usually depicting a description of a challenging situation the management of a company might face. Teams normally have 3 to 4 hours for case

solving and preparation, whereupon they immediately present their solutions in front of a jury. A jury, consisting of both company representatives and university professors, will assess the teams on various criteria, such as problem analysis, feasibility of the solution and quality of the presentation. Teams are judged on one case study in the Local Qualification, two in the Semi-Finals, and eventually three in the Final.

Being a very dynamic and important student case study competition, The Tournament in Management and Engineering Skills requires well organized team work and prepared working structure from competitors. The use of the 5C model helps significantly in working process simplification.

## **6. Conclusion**

In this paper the 5C business case study solving methodology, which is applicable not only to student competitions but also to various real life business problems, is presented and discussed. The importance of its practical structure and development through learning by doing practice is emphasized. We strongly believe that it is applicable as a roadmap for problem solving activities of SMEs as well as big companies in the Republic of Serbia and worldwide.

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## **The Occurrence of Levels of Thinking in the Sharea Books Questions in Jordan**

### **Abstract**

This study aims to reveal the occurrence of thinking levels questions in the books of Sharea (Islamic religion) in the Sharea schools that belong to the ministry of religious affairs and holy places in Jordan for the academic year 2008–2009.

The 10<sup>th</sup> grade book was chosen as the study sample. The books include 565 questions. This study tries to answer the main research question which is: to what extent do the levels of thinking occur in the 10<sup>th</sup> grade Sharea books questions?

The study used the content analytic style. The study tool is a thinking level questionnaire based on Gallagher and Aschner's levels of thinking. After confirming the truthfulness and firmness of the tool, it was carried out on the study sample and resulted in the following:

- The 10<sup>th</sup> grade Sharea books questions were distributed among the thinking levels as follows: first category: the Cognitive thinking with the overall percentage of 86.73%, the second category was the Evaluative thinking with the percentage of 6.4%, the third category was the Divergent Questions with 4.07% and the fourth category was the Convergent Thinking Questions which had 2.8%.
- The study has several recommendations such as the necessity for developing the Sharea curriculum, as it has not been developed or modified since the time it was first taught.

Modifying the Sharea books questions so as it would comprehend all levels of thinking.

## **The study background**

The world is witnessing huge knowledge progress, as it doubles with a tremendous speed, which decreases the chance for the human mind to grasp all of its aspects. Educators and scientists stated clearly their inability to provide all of the required information to the pupil, nevertheless, they can provide him/her with the necessary training on the basis of the rational thinking also develop his/her levels of thinking so that he/she would be able to explore the world of knowledge, rediscover them, use them into innovating new aspects or implementing them practically by transforming the knowledge he/she has into suitable situations that he/she could face in life. The pupil would also be able to perform the operation of analysis, construction and modification which is known worldwide today as cognitive economy.

As for thinking, scientists', researchers' and educators' opinions vary as far as defining thinking is concerned, as they have defined it based on several theories. Jarwan (2007 P40) defined thinking as "series of unseen mental activities which the brain performs when stimulated and received by one or more of the five senses." Aloher (2004, p. 316), on the other hand, defines thinking in its wide range as "searching for the meaning of a certain entity based on a previous experience, which could be an action, an accident, a signal or an opinion; when we think we use some mental operations that range in their complexity levels, to enable us to process the input and produce new ideas, new understanding or make a judgment of some sort." Abu Jadu and Nofel (2007 p. 28) revised various definitions of thinking and arrived at "the complexity of thinking, its multi dimensions and its entanglement, which reflects the complexity of the human body and its operations, which clearly proves that thinking like all the mental processes is hard to directly measure and identify."

The literature is full of thinking definitions, which differ according to the scope of their authors. Some focus on the understanding and establishing meaning, others focus on problem solving and decision making, another ones focus on the mental processes of thinking. Generally, thinking is a natural phenomenon just like walking. Although every child matures until he reaches a point when he walks whether we teach him or not, yet learning how to walk in order to win a walking competition, for example, does not occur simultaneously, rather it needs continuous training to reach the advanced stage of walking.

Thinking also has the same nature, each one of us was created with an advanced or primitive ability to think, yet to reach the level of smartness and to master its multi-skills needs continuous learning as well as training. Developing the thinking

process is considered one of the major directions of the education process. It has special importance among educators.

Lately, the development of thinking process levels among students has had a huge amount of importance in order to direct the education curricula into more thinking provocative; this was reflected in textbooks which had exercises related to developing the thinking levels of students. (Alkhadraa, 2005; Ministry of Education 2006; Jarwan 2007 and Hussein 2008.)

One of the central points that arise in the thinking sector is educational questions, which play a major role in the learning process. It is rare to find a learning situation that does not use questions to explain and clarify that situation. An educational question is defined as “a stimulator that requires a reaction or a reflex, and which requires from the learner a certain amount of thinking and revision of the educational material followed by retrieving the stored information in his/her memory in a way that insures his/her correct answer” (Darwaza, 1997, p. 30)

The literature also classifies these questions into three criteria : quality standard questions, which are classified into: analytical, realistic, discretion, and meta-physical. Standard function questions are categorized into: focus, building, extension, and height. The standard levels of questions, whose most famous classifications are Bloom’s Taxonomy and Gelevord classification. Then Gallagher and Aschner’s classification, which was built on Gelevord classification ; it consists of four levels, namely:

- Cognitive thinking Questions

This type of questions relies on the student’s ability to know qualitative details, terms, specific characteristics, approaches and means of handling details, generalizations, rules and regulations, categories, translation, i.e., transforming information from one type to another yet holding the main idea, explaining, i.e., reorganizing, displaying, explaining and summarizing the main ideas and finally deduction, i.e., using information to teach goals and making comparisons, interviews and showing comparisons and contrasts.

- Convergent Thinking Questions

These questions require the student to apply and analyze information. To insure student success in this mission, they have to acquire wide knowledge of the types of information which lies in the 10<sup>th</sup> grades in Jordan. It aimed to reveal the coverage of the cognitive, emotional and skill sectors. The study aimed to identify the type of questions’ whether subjective or objective’ and the types of objective questions used. The most accentuated results shown by the study was the imbalance of the types of questions that occurred in the Islamic education books and the Recitation

rules books. The results showed concentration on the cognitive sector and focused on the lower level of cognition.

Through reviewing the relevant studies on the books of Islamic Education or some other material, the researcher found out that these studies aimed to identify the concentration of thinking skills in these books. As for the samples of previous studies, some of them dealt with books of elementary stage, such as Jallad (2001), and some addressed the primary and secondary stages books, such as Salman (2007), none of the studies addressed the Sharea books material. As for the tools of the previous studies, some used group classifications related to the subject of the study, e.g., Salman (2007), Al Ayasrah (2004), and Al Jallad (2001). On the other hand, this study used the form analysis based on the classification of Gallagher and Aschner. The researcher has not found a study that used this classification so far.

### **The Study Methodology**

The curriculum appropriate for the purposes of the present study is the descriptive content analysis style, which describes the phenomenon and monitors the occurrence of the categories of analysis accurately.

### **The Study Sample**

The study sample consisted of all the assessment questions in the books of Sharea courses for the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> grades in the schools of the Ministry of Awqaf and Islamic Affairs, for the academic year 2009/2008. The final assessment questions were selected in the Book of the 10<sup>th</sup> grade. This is due to the fact that the 10<sup>th</sup> grade is the final grade of the elementary stage, and a large number of researchers indicated the need to focus on the higher-order thinking skills. Consequently, the study sample included 565 questions which were distributed on the book units as mentioned in the Table below.

**Table 1.** Distributing questions on the units

Class Unit	The holy Quran	The righteous ancestors	The prophets teachings	Jurisprudence "Fiqh"	Total
No. of questions	172	109	161	123	565

### **The study tool**

The researcher prepared a form of analysis depending on the classification of Gallager and Aschner, where the researcher used this classification considering

his categories of analysis, which has four levels of thinking: (cognitive thinking and convergent thinking and divergent thinking, and evaluative thinking). The researcher used questions as units of analysis.

### **The Tool Truthfulness**

After preparation of the study tool, it was shown to a group of five professionals who are experts in the subject of the study. The researcher accredited the accord percentage of 80 % and more to judge the tool truthfulness. The researcher made the amendments referred to by the experts in terms of wording and clarity of the analysis categories.

### **Analysis Stability**

To verify the stability of the analysis form, the researcher followed the stability analysis method with others, the researcher chose a random sample of the Sharea books questions with the percentage of 5%. The total number of questions reached 115. The researcher then retrieved the coefficient of agreement according to Holsti equation: where the stability coefficient total was 79.25%.

### **The Study Procedures**

To answer the study questions the researcher followed the content analysis for evaluating questions, the researcher followed the following procedures:

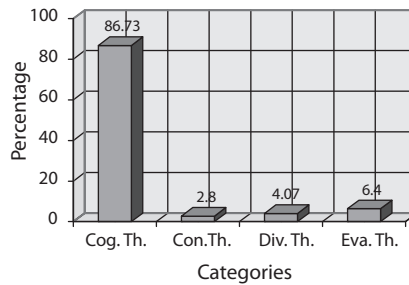
1. Determining the study sample, which included all the questions contained in the books of Sharea courses for the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> grades for the 2008/2009 school year, in the Sharea schools that follow the Ministry of Awqaf and holy places in Jordan. The researcher adopted the evaluative question as a unit of analysis. The questions were then inspected; to determine the level of thinking they belong to according to the criteria and behavioral qualities adopted in the study tool, in the case of a compound question, the researcher considered each part as a separate question.
2. Designing the analysis tool (instrument of the study); through referring to the theoretical literature in the field of Gallagher and Aschner's classifications of the levels of thinking; to measure the levels of thinking included in the Sharea books questions in the elementary schools in Jordan. Ensuring the veracity of the tool was done by offering it to a group of expert referees, and then ensuring the stability of the analysis through the reliability analysis with others.
3. Practical analysis.
4. Extracting the results of the study question.
5. Discussing the results and presenting the findings and recommendations.

## Study results and discussion

The results related to the main question of the study: to what extent do the levels of thinking occur in the 10<sup>th</sup> grade Sharea books questions in the schools of the Ministry of Awqaf and religions and holy places in Jordan?

To answer this question, calculation of the questions contained in the book of Sharea materials for the 10<sup>th</sup> grade in the elementary school; there were 565 questions.

They were classified according to the criteria derived from Gallagher and Aschner. The number and percentage of the questions of each category were calculated. They are represented graphically in Figure 1.



**Figure 1.** Distribution of the 10<sup>th</sup> grade Sharea books questions on the Analysis Categories

Table 2 and Figure 1 show that the analysis categories distribution in the book was presented as follows: the first category, the cognitive thinking, with overall 86.73%, the second category was the evaluative thinking with 6.4%, the third category was the divergent questions with 4.07% and the fourth category was the convergent thinking questions with 2.8%. The reason for the previous distribution could be related to the fact that this curriculum was accredited by the Ministry of Religious Affairs in 1990, and has not been modified or developed since. The results of the study in hand agree with Salman (2007) and AlJallad (2001), who, although in different countries, showed that the cognitive questions were concentrated on the lower cognitive levels and did not concentrate on developing the student's thinking. It could be inferred that the system is still looking at the student as an information store instead of a thinker and an information producer.

The books units questions distribution on the analysis categories were measured by counting the number of questions that occur in each of the units in the 10<sup>th</sup> grade Sharea book, then they were classified according to the criteria derived from

Gallagher and Aschner's classification. The number and percentage of the questions in each category were calculated as shown in Table 2.

**Table 2.** Distribution of the 10th grade Sharea books questions on the analysis categories:

	Cog. Th.	Con. Th.	Div. Th.	Eva. Th.
Qur'an	160	0	12	0
percentage	28.32%	0%	2.12%	0%
Hadith	141	6	9	5
Percentage	29.96%	1.06%	1.59%	0.88%
Fiqh	82	8	2	31
Percentage	14.5%	1.42%	0.35%	5.49%
predecessors	107	2	0	0
Percentage	18.94%	0.35%	0%	0%

Table 2 and Figure 1 show that the analysis categories distribution in the book was presented as follows: first category: the cognitive thinking with 86.73%, which occurred in the books units as follows :the highest was in the Prophet's Speeches unit with 29.96%, next was the Holy Quran unit in the second place with 28.32%, third the Prophet's Life unit with 18.94% and finally the Fiqh (Islamic principles) unit with 14.5 %.

**The second category** was the Evaluative thinking with 6.4%, which was presented in the units as follows: the first unit is the Fiqh unit with 5.49%, the second was the Prophet's speech with 0.88%, the holy Quran unit and the Prophet's life did not have any percentage.

**The third category** was the divergent questions with 4.07%, which was presented in the units as follows: the Holy Quran unit with 2.12%, next was the Prophet's speech unit with 1.59%, the Fiqh unit had the third place with 0.35%, the righteous ancestors unit did not register any percentage.

**And the fourth category** was the convergent thinking questions which had 2.8%. The Fiqh unit had the first level with 1.06%, the righteous ancestors in the second place with 0.35%; the Holy Quran unit did not register any percentage.

Through this matrix the researcher recorded the following observations:

**First:** the cognitive thinking level had the highest percentage in all the units. This might be caused by the interests of the authors who focus on filling the content of these curriculum with educational knowledge that concentrates on memorizing, in spite of the higher level of thinking. The modern pedagogical

approaches advocate knowledge economy and calls for improving the levels of thinking among students

**Second:** The question of disorder and disharmony between the levels of thinking is still clear. This disorder may be due to a lack of clarity of thinking and levels of matrix scope and sequence in the minds of the authors. Based on the formation of this curriculum, the researcher held a scientific visit to the Ministry of Awqaf and Islamic Affairs to stand on the nature of the Sharea curriculum and schools. The researcher found only unpublished reports about the Sharea schools and the outline of the platform for Sharea curriculum.

**Third:** the percentage of the divergent and evaluative thinking increases particularly in the Fiqih (Islamic Principles) unit. This could be attributed to the nature of the Fiqih, which has special characteristics. Fiqih scientific material has a slight concentration on memorizing and has its focus on practicality and evaluation, the best way to learn the funeral prayer, e.g., is by practice.

**Fourth:** the dominant ratio in the questions of the Holy Quran, Hadith and the biography of the righteous ancestors units is to the cognitive thinking, which focuses on understanding and comprehension. This may be attributed to the fact that the curriculum was prepared a long time ago. It did not have any comprehensive development plan added to the nature of these units which concentrate on cognitive thinking; nevertheless, careful consideration can enhance rates of other levels of thinking in these units.

Based on the findings of the study, the researcher recommends the following:

- Paying attention to the questions of divergent thinking in the Sharea books from the seventh to the tenth grades.
- Paying special attention to the Sharea books questions to cover the higher levels of thinking, and not to neglect any thinking level.
- Paying attention to the distribution of levels of thinking and incorporating them among the grades.
- Preparing a standard scientific relative criterion that depends on the nature of the content knowledge, the nature of the learner and the results of research and studies in this area; to determine which levels of thinking to integrate into the curriculum, and the proportion of each of these levels; to form the standard basis for authors of the curriculum, to benefit the teacher when preparing exam questions.
- Drawing the attention of researchers to Sharea schools; through conducting empirical studies on students of these schools, and analytical studies on the curriculum of the religious materials.

- Holding workshops and training courses for teachers of Sharea, focusing on the modalities for the development of thinking among students.

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## **Longitudinal Investigation of Nursing Students' Self-Directed Learning Readiness and Locus of Control Levels in Problem-Based Learning Approach**

### **Abstract**

The study was conducted to observe changes in nursing students' Self-Directed Learning Readiness (SDLR) scores and Locus of Control (LOC) scores during their four-year education with the PBL approach and to determine the relationship between SDLR and LOC.

The sample included 47 students. Data were collected with LOC and SDLR scales. When the students' four-year scores were compared, a significant difference was observed between SDLR scores and LOC scores. In both scales, the nursing students' second and third-year scores increased significantly compared to their first-year scores whereas their fourth-year scores decreased. There was a negative weak correlation between the SDLR scores and LOC scores of the students in every year. Both the SDLR scores and LOC scores decreased in the fourth-year students because the students spent a large part of their time on clinical education. Therefore, it might be proposed that fourth-year curriculum should include topics which might help them cope with stressors associated with issues such as individual development and job finding.

**Key words:** *self-directed learning readiness, locus of control, nursing students, problem-based learning.*

## **1. Introduction**

At present, self-directed learning (SDL) activities in nursing education are emphasized and a problem based learning approach is employed to encourage critical thinking, problem solving, SDL and synthesis of knowledge in nursing students (Kluklin et al. 2010; Kocaman et al. 2009; Williams, 2001). The problem-based learning approach that shifts the focus from teacher-centered education to student centered education is believed to facilitate SDL (Chakravarthi et al. 2010; Biley, 1999). SDL is an important component of life-long learning and a skill which has to be acquired to be successful in life after school (Levett-Jones, 2005). Barrows (1986), describes SDL as one of the goals of PBL. Patterson et al. (2002) considered SDL as an important competence that students should gain during their nursing education. The most common definition is that by Knowles (1975), who defined SDL as

*a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies and evaluating learning outcomes (Cited in: Williams, 2004).*

SDL is a method which requires that students themselves have the primary control over their learning, be responsible for their own learning and decide where, when, how and what to learn (Ellinger, 2004; O'Shea, 2003; Lunyk-Child et al. 2001; Wiliams, 2001; Linares, 1999). These definitions have one thing in common: students have responsibilities for and control over the process of learning from its planning and management to its evaluation. It has been reported that students with high SDLR levels are aware of their responsibilities for their own learning, act independently without help from others, are curious, enthusiastic and self-confident, are good at time management and have the ability to make plans to fulfill their duties (Hewitt-Taylor, 2001; Williams, 2001).

Cognitive learning theories focus on SDL and the necessity for learners to take responsibility for their learning and their active participation in learning. It is emphasized that the students who select their own actions in the learning environment and who encourage themselves have more control over and responsibility for their learning (Levett-Jones, 2005; Lunyk-Child et al. 2001; Linares, 1999). This type of control is explained by Locus of Control (LOC) in educational studies. It has been noted that LOC is an important predictor of SDL and success at higher education (Yuksel, 1998; Zile-Tamsen, 1997).

LOC is formed during developmental stages, starting in childhood, and is associated with expectations about what types of behavior result in what outcomes and whether these outcomes are caused by internal or external factors (Anderson et al. 2005; Alisinanoglu, 2003). Individuals with internal LOC believe that they have control over what happens to them and they can take serious responsibilities for the management of their life (Rockstraw, 2006; McAllister, 2003; Yesilyaprak, 2003). However, individuals with external LOC believe that they do not have control over what happens to them and attribute everything they experienced to fate or fortune (Serin et al. 2010; Rockstraw, 2006; McAllister, 2003;).

It has been stated that SDL is associated with internal LOC, and that the purpose of all education levels is to increase internal LOC by developing self-esteem and self-confidence in students. In addition, individuals with internal LOC have high levels of SDLR and have high performance compared to individuals with external LOC (Ofori and Charlton, 2002; Yu, 2002).

PBL has been one of the most powerful teaching methods to encourage students to take responsibility for their own learning. Skills of self-assessment and SDL allow the student to become sensitive to personal learning needs, to locate and to properly use appropriate information resources. A literature review, in which Self-Directed Learning Readiness (SDLR) scores of nursing students who had an education with the PBL approach were longitudinally investigated, revealed that the PBL approach increased in the second-year students and, although to a lesser degree, in the third – and fourth-year students too (Kocaman et al. 2009). In cross-sectional studies in which the effects of the PBL approach on nursing students' SDLR scores were examined, it was found that SDLR scores of the fourth-year students were significantly different from those of the first-year students (Gönülal and Bahar, 2005; Özbodur and Elçigil 2005). In another study, SDLR scores of the students in the same training program were determined both at the beginning and at the end of the first-year and it was found that their post-training SDLR scores were significantly higher than their pre-training SDLR scores. (Gördes and Bahar, 2005).

In a course in which the PBL approach was applied, nursing students' post-course SDLR scores were found to be significantly different from their pre-course scores (Mohammed Ali and El Sebai, 2010). In a cross-sectional study by Sengün and Duman (2005), it was found that both LOC scores and SDLR scores of the first-, second – and third-year students increased and that there was no association between LOC and SDLR scores of the fourth-year students.

Since the effects of SDL on critical thinking and problem solving in nursing education are well known (Lunyk-Child et al. 2001), it is important to know whether

the SDLR scores of nursing students trained with the PBL approach change or not. In the literature, no longitudinal study, in which SDLR and LOC scores of students trained with PBL were simultaneously investigated, was found. As a result of simultaneous investigation of SDL and LOC, it was considered that SDL and LOC, an important individual characteristic in the PBL approach, would provide data for planning educational activities and arranging the education program consistent with students' characteristics.

This study examined the development of SDLR and LOC, the relationship between SDL and LOC in the same student group throughout their four-year nursing education within a PBL curriculum.

- What is the change in SDLR and LOC mean scores throughout four-year nursing education in PBL curriculum?
- What is the change in the relationship between SDL and LOC mean scores throughout four-year nursing education in PBL curriculum?

## **2. Methods**

### **2.1. Study Design and Sample**

It was a descriptive and longitudinal study. The study was performed at a school of nursing located in Western Turkey. The PBL approach was started in Dokuz Eylül University of Nursing School (DEUNS) in the 1999/2000 academic year in Turkey. SDL is an integral component of the problem based learning instructional approach (Kocaman et al. 2009).

No sampling method was used. There were 84 students enrolled in the first year of the nursing program and 47 students completed both SDLR and LOC tests at program completion (response rate of 55.95 %). The data for the first-, second- and third-year students were collected in the first week of the next academic year. The data for the fourth class were collected a week before graduation. It took approximately 20 minutes to complete. The students ranged in age from 17 to 22 with a mean age of  $19.52 \pm 1.45$ .

Ethical approval was obtained from the ethics review board of the school of nursing. The students were informed about the study prior to agreeing to participate in it and were assured that their participation in the study was entirely voluntary.

### **2.2. Instruments**

Data were collected with the use of a Self-Directed Learning Readiness Scale and Locus of Control Scale.

### 2.2.1. Self-Directed Learning Readiness (SDLR) Scale

The SDLRS can be administered to adolescents and adults. It is a five-point Likert scale, the grading of which ranges from 1 (strongly disagree) to 5 (strongly agree). The scale is composed of 3 subscales and 40 items. The subscales are self-management (13 items), willingness to learn (12 items) and self-control (15 items). The lowest and the highest scores for the scale are 40 and 200 respectively. As the score for the scale increases, so does the ability of self-directed learning (Fisher et al. 2001).

Fisher et al. (2001) reported that the internal reliability coefficient of the SDLR scale was 0.92. Cronbach's alpha was 0.85 for self-management, 0.84 for willingness to learn and 0.83 for self-control. The reliability of the scale with its 40 items for Turkish population was tested by Kocaman et al. (2006) and Cronbach's alpha of the scale was found to be 0.93. In the present study, the analysis made for the internal reliability of the scale revealed that Cronbach's alpha of the scale was 0.80.

### 2.2.2. Locus of Control (LOC) Scale

The scale is composed of 47 items and can be administered to individuals aged over 17 and at least secondary school graduates. It is a five-point Likert Scale and 1 corresponds to 'totally inappropriate', 2 to 'quite inappropriate', 3 to 'appropriate', 4 to 'quite appropriate' and 5 to 'completely appropriate'.

Twenty-five items of the scale are direct scored and 22 items are reverse scored. The highest and the lowest scores for the scale are 235 and 47 respectively. The LOC scale has five subscales, namely, personal control, believing in fortune, pointlessness of struggling, fatalism and the belief of an unfair world. Higher scores show external locus of control. Low scores indicate increased internal LOC.

The internal consistency coefficient of Cronbach's alpha was 0.92 and the test-retest reliability coefficient was  $r = 0.88$  (Dag, 2002). In the present study, Cronbach's Alpha score was 0.70.

## 2.3. Data Analyses

Data analysis was performed using the Statistical Package Program for Social Sciences (SPSS), version 15.0. The data were evaluated with a repeated measures analysis of variance, Bonferroni-corrected paired t-test of the gap between two universes and Pearson correlation analysis. Differences in the SDLR and LOC scores during the study period were tested with a repeated measures analysis of variances. Bonferroni correction was used to determine which group, if any, was significantly different from another group. Pearson Correlation analysis was used to determine the relationship between the SDLR scores and LOC scores.

### 3. Findings

There were significant differences in the mean SDLR scores of the nursing students according to the year in the program ( $F=16.87$ ,  $p=0.00$ ) (Table 1). Further analysis (Bonferroni) showed that the SDLR mean scores were significantly lower for the first year than for the other year students. The third-year students' SDLR scores were the highest.

There were significant differences in the mean LOC scores of the nursing students according to the year in the program ( $F=6.57$ ,  $p=0.00$ ). Further analysis (Bonferroni) showed that the third-year students had the lowest LOC scores and the fourth-year students had the highest LOC scores. Higher scores indicate increased external LOC. Low scores indicate increased internal LOC (Table 1).

**Table 1:** Comparison of Students' Self-Directed Learning Readiness and Locus of Control Mean Scores According to Program Year (n= 47)

Years	Students' Self-Directed Learning Level*				Locus of Control Level**			
	$\bar{X}$	$\pm$	Min.	Max.	$\bar{X}$	$\pm$	Min.	Max.
First Year	161.02 <sup>a</sup>	14.39	138	187	104.80 <sup>a</sup>	19.81	51	148
Second Year	173.76 <sup>b</sup>	14.36	135	197	96.55 <sup>b</sup>	17.04	54	132
Third Year	174.00 <sup>c</sup>	14.84	134	200	96.32 <sup>c</sup>	22.03	57	151
Fourth Year	168.04 <sup>d</sup>	14.74	138	200	107.87 <sup>d</sup>	19.29	71	142
$F=16.87$ $p=0.00$ ***				$F=6.57$ $p=0.00$ ***				

\* a<b, a<c, a<d, b>d, c>d \*\*a>b, a>c, b<d, c<d \*\*\* $p \leq 0.05$

Higher scores indicate increased external locus of control. Low scores indicate increased internal locus of control.

**Table 2:** The Relation Between Locus of Control Scores and Self-Directed Learning Readiness Scores (n = 47)

Years	r	p
First Year	-.292*	.047
Second Year	-.339*	.020
Third Year	-.325*	.026
Fourth Year	-.336*	.021

\* The level of significance used for the correlations was  $p \leq 0.05$ .

When the relationship between the students' SDLR and LOC was investigated, it was observed that there was a negative weak correlation between SDLR and LOC

scores of the students in every year (first year:  $r = -.29$ ,  $p = .047$ , second year:  $r = -.33$ ,  $p = .020$ , third year:  $r = -.32$ ,  $p = .026$ , fourth year:  $r = -.33$ ,  $p = .021$ ) (Table 2).

#### **4. Discussion**

In this study, SDLR and LOC development in the nursing students who had an education with the PBL approach during their four-year program and the relationship between the two variables were investigated. In the study, the lowest mean SDLR scores were obtained in the first-year students. The SDLR scores increased in the second – and third-year students but decreased in the fourth-year students (Table 1).

In a longitudinal study conducted by Kocaman et al. (2009), a significant difference was determined between SDLR scores of the first-year students and the students of all the other years; however, the difference between the SDLR scores of the second-, third – and fourth-year students was smaller. In another cross-sectional study conducted in the same nursing program, the SDLR scores of the fourth-year students were significantly higher than those of the first-year students (Özbodur and Elçigil, 2005). Still, in another cross-sectional study in the same training program, the students' SDLR scores were found to be low in the first year but to significantly increase in the second, third and fourth years (Gönülal and Bahar, 2005). In a single-group quasi-experimental study conducted by Mohammed Ali and El Sebadi with nursing students (2010), it was found that there was a significant difference between the pre – and post-class SDLR scores of the students after a class performed with the PBL approach. Therefore, it was stated that PBL is a learning approach which improves SDL. Our first-year training program aims to prepare students for the PBL approach and SDL. The program mainly focuses on the principles of nursing, roles and functions of a nurse, and the protection and development of health. The increase in the students' SDLR scores in the second and third years compared to those in the first year indicates that the students recognized the importance of SDL in order to be successful in the PBL program, and that their compliance with and acceptance of this program evolved. In the literature, too, it is reported that upper-year students' SDL skills develop better than do first-year students' (O'Shea, 2003). In our second and third years training programs, scenarios in the PBL approach mainly include common health problems, health care needs of a patient, family, home and community, and clinical applications. When the students begin the fourth year, the program changes and they spend most of their time in clinics, work on night shifts and participate in PBL

sessions once a week. It is considered that with the increasing clinical expectations from students in clinical environments (department nurses expect students to adhere to routines and work-oriented studies) they comply with the requirements of external locus of control more and therefore their SDL decreases.

For the above-mentioned reasons, the fourth-year students may be experiencing distress as a result of the heavy workload of clinics, course load, and preparation for exams to start working. In addition, it is thought that although students are expected to employ some of the skills obtained from the PBL approach in the clinical environment, they are affected by nursing models in that clinical environment.

In the study, it was determined that the students' internal LOC scores in the second and third years were higher than those in the first year and they had the lowest LOC scores in the fourth year (Table 1).

In a study by Yeşilyaprak (2003), university students' LOC scores at the time they started university and at the time they completed their four-year course were evaluated and a significant improvement was determined in their internal LOC scores. Similarly, Ofori and Charlton's (2002) study on nursing students determined that internal LOC scores of upper year nursing students were higher than those of lower year students. In comparison to the findings in the literature, a decrease in the internal LOC scores of the fourth-year students in our study is a different finding.

The students' SDLR and internal LOC scores in the second and third year were higher than those in the first year, while in the fourth year, although there was a significant correlation between the two variables, both the SDLR and internal LOC scores decreased (Table 2). An decrease in the LOC score indicates an increase in the internal locus of control. This result shows that the SDLR score increases in line with the increase in the internal LOC score.

In a cross-sectional study by Sengün and Duman (2005), while a significant correlation was determined between the LOC and SDLR scores in the first and second year students, there was not a significant relationship between the LOC and SDLR in the third and fourth year students.

Likewise, Zile-Tamsen (1997), found a relation between LOC and SDL (two dimensions: cognitive strategy use and resource management). Linares (1999), reported that nursing students with internal LOC had higher scores for SDLR than those with external LOC. Consistently with the literature, we found that the students with internal LOC took more responsibility for their learning and received higher scores for SDLR.

We found a significant, negative, weak relation between the LOC scores and SDLR scores. Decreased LOC scores showed increased internal LOC and as LOC

scores decreased, SDLR scores increased (Table 2). Yu (2002), also found that people with internal LOC had a better performance in learning and higher SDLR scores.

## **5. Conclusion and Recommendations**

At the school of nursing where this study was conducted problem based learning is used. The study is of importance since it was designed to determine whether there was a difference in SDLR and LOC scores of nursing students who had an education with the PBL approach within their four years of study.

Although the PBL approach increases students' SDL responsibility, the fact that a cultural approach affects learning and how students' characteristics affect this learning approach are among the issues which need to be questioned. It is recommended that further studies should concentrate on students' SDL perceptions and the factors affecting SDL. It was observed that the students were not attentive enough while filling in the scales after the first year, which is considered as a limitation of the study.

Since the lowest LOC scores were obtained in the fourth year, this may have affected the SDLR scores in this year. Because it is known that SDL is affected by individuals' characteristics, such as having internal control and autonomous control. However, the decrease in the internal LOC scores in the fourth year where there is more clinical training suggests that approaches which increase external LOC scores in the clinical area are dominant. Therefore, it is recommended that the fourth-year training program should be revised and it should include topics which might help students to improve their personal development and to cope with stressors regarding job hunting.

The lowest LOC scores obtained in the fourth year might be due to forcing students to have external LOC in clinical training areas (work-oriented studies, presence of nursing models with external LOC). It is thought that the reason why SDLR scores decrease might be due to the fact that students get prepared for tests to start work. In addition, a decrease in the internal LOC scores, one of the characteristics of an individual, may be the cause of the decrease in SDLR scores. With reference to these results, it might be suggested that the fourth-year clinical training program and the atmosphere of the clinical areas should be reevaluated and that the program should include topics which might help students to cope with stressors regarding clinical areas and job hunting. It is recommended that further studies should concentrate on factors affecting SDLR and LOC scores,

students' SDL perceptions and the problems students cope with in clinical areas in the fourth year.

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**Social  
Pedagogy**



## Counteracting Social Exclusion of Disabled Women in the Opinions and Assessments of Expert Milieus

### Abstract

In the article I have presented the opinions and assessments of experts/ practitioners working with handicapped people on the causes, fields of social exclusion, factors facilitating and impeding their social inclusion. The research described in the text presents a short report on the research conducted by me in 2010, which will be published in the book entitled *Danger of the Social Exclusion of Disabled Women*.

**Key words:** *marginalization, social exclusion, discrimination, causes of exclusion, social inclusion, disabled women, experts, practitioners.*

### Introduction

Disabled women constitute a category of handicapped people whose social situation is particularly difficult. The difficulties that handicapped women encounter have different causes and result from social roles which are stereotypically assigned to them. They experience various forms of discrimination (due to their disability and their sex). Social, psychological, communication, educational, transport, architectural, spatial, institutional and other barriers, which they encounter in their social functioning in everyday and professional life, are of significance here. The aim of treating them as women often justifies the applied discrimination actions and behaviors. It is commonly believed that they cannot fulfill the female roles and they are allowed to function within the identity of a disabled person, which is not

conducive to satisfying the needs and restricts or hinders them to use the rights to which they are entitled.

The aim of the article is to present opinions of experts/ practitioners concerning the causes, fields of social exclusion of women with disabilities, the factors conditioning them and actions which are conducive to their social exclusion. The way of perceiving the needs, discerning the possibilities and restrictions of handicapped women exerts an impact on the mutual relationships between the disabled people and practitioners working with them, underlies the actions conducted by them, but also outlines the direction in various solutions taken up in relation to them.

The discernment of opinions and assessments of experts on the issue of the social and legal exclusion of disabled women, factors hindering and facilitating their social inclusion and possibilities to take up actions by various entities and institutions in favor of incorporating them in the social life seems valuable from the cognitive point of view.

An expert interview was applied in the research. The research comprised 41 practitioners, including social employees, teachers, trainers of occupational therapy workshops, caretakers of people with disabilities in nursing homes, guidance counselors, two municipal representatives dealing with disabled people, two directors of nursing homes and the director of the municipal social welfare center, heads of the regional societies of the Polish Association of the Blind. All the participants have long-term professional experience in working with handicapped people with different types and degrees of disability (the longest seniority is 36 years, the shortest 2 years).

## **Report on the research**

The surveyed people pointed out that among the causes hindering the social functioning of handicapped women there were: their psycho-physical features (depending on the type and degree of disability), a delicate emotional-psychological structure of these women, weak community life skills, improper image of self, lack of acceptance of oneself and one's own disability. Experts also noticed external causes such as: negative attitudes towards handicapped women, stereotypes, prejudice, underestimation of their competence and skills, architectural, spatial and communication barriers, their isolation from society caused by being placed in nursing homes, lack of public awareness of their problems. Negative attitudes, according to experts, are manifested in miscellaneous ways in all the

three dimensions: cognitive, emotional and behavioral ones, in which they occur most frequently.

When the interviewed people were asked about the fields of life in which disabled women were exposed to social exclusion, they most frequently indicated the productivity sphere (their more difficult situation on the labor market than that of disabled men, especially on the open labor market), the sphere of consumerism (access to consumer goods), the social sphere (access to medical care, specialist doctors), the cultural sphere (architectural and mental barriers in cultural institutions), the sphere of politics (access to active participation in political life).

Sex and disability, in the opinion of the interviewed people magnify the problems of handicapped girls and women and if the disability is visible, it discourages contacts with such people in the professional, social and intimate sphere.

*Disabled women are perceived as asexual. Such women are deprived of the right to be a wife or a mother and all needs in the range of their sexuality are still a taboo topic. They are deprived of the possibility to fulfill social roles from the point of view of sex. They have no chance to fulfill themselves in these roles because they are not given the chance. It sometimes happens that even if they acquire education, they are deprived of the possibility to live independently. From the point of view of professional usefulness, they are perceived as worse than non-disabled women, who have lower educational qualifications and who are definitely less proficient. A lot of women with disabilities live with their families, they are professionally passive and they are completely dependent on the members of the families, not only from the financial point of view.*

Interview with an employee of the district disability evaluation board

*The link of disability with sex increases the negative social attitudes, people think that apart from being handicapped, she is additionally a woman – she is not attractive, she cannot fulfill any role even as a woman, a wife, a mother.*

Interview with the director of the social welfare center supervising nursing homes for the disabled

*I think that disability still arouses fear and misunderstanding. It is even more difficult for disabled women to cope with the feminine ideal promoted in the media, which may cause them to withdraw from social life. However, the lack of acceptance is the key issue. Labeling and not differentiating the types or degrees of disability, perceiving all handicapped women as a homogenous group is also a problem.*

Interview with the head of the occupational therapy division of the nursing home for people with eye injuries

*Handicapped women are excluded from the so-called male-female relations. I suppose it is due to the fear that they are not able to fulfill maternity duties and that is why they are perceived as inferior.*

Interview with the representative of the municipal office dealing with the issues of handicapped people

According to the interviewed people, the reasons for social exclusion are connected with the restricted possibilities of handicapped women and the maladjusted social conditions in relation to their needs and possibilities. The interviewed people pointed out that there was a low social awareness of the problems concerning handicapped women, there were negative stereotypes and prejudice against them (conviction about their low competence and small possibilities), there were various symptoms of a lack of tolerance and acceptance, labeling and tagging and discrimination. The discrimination of handicapped women, according to experts, hinders their ability to perform social roles (maternity, partner, professional), non-disabled people distance themselves from them and depreciate their values. It assumes diverse forms: their isolation, derision, ridicule, limitation of the rights to which they are entitled.

A few of the interviewed people drew attention to institutional discrimination, which results from the actions of institutions – especially social welfare institutions, courts, schools. In the practitioners' opinions, the situation of disabled women is particularly difficult on the labor market, as they are treated in a worse way by employers, they have a smaller chance to get a job, they have impeded access to higher ranks, they have lower wages, they cannot pursue certain professions. According to the practitioners, the obstacles these women face in fulfilling their professional roles and lack of access to work spaces in state offices is the dominant form of discriminating handicapped women.

Handicapped people are excluded, because society has little knowledge of disability, their needs and potential. Handicapped people are still perceived as "different", "often inferior".

Interview with a teacher

*The reason for the exclusion of handicapped women is: sex and, at the same time, disability – due to the stereotypical perception that they are incapable of living independently, thus they belong to the worse category of people, not being able to fulfill their social roles (of a wife, a mother). The actions undertaken here are often of disintegrative rather than integrative nature. Special treatment, on the one hand, favorable due to the factual limitations resulting from disability, on the other hand, exaggerated exposure of the dysfunction, which exerts an impact on the final level and comfort of the functioning of a handicapped woman in a given group and on her image in society – everyone sees, first of all, her disability and not a human being or a woman.*

Interview with the director of the social welfare center supervising nursing homes for the disabled

The factors causing the exclusion of handicapped women in different spheres of life are, in the opinion of the interviewed people, varied. Their individual features (type of disability, sex, lack of or a low education, low professional qualifications, lack of motivation to work, smaller availability and efficiency, low self-esteem) and their families (overprotectiveness of parents, lack of family support, dependence on parents and the stereotype that a handicapped woman is to live with her family of origin) cause the exclusion of handicapped women from the labor market. The reason for the difficult situation of disabled women on the labor market, according to the practitioners, is the economic situation in Poland (unemployment, requirements imposed on employees, big competition, few job offers for handicapped women), social barriers and also defaults occurring in the process of the social and professional rehabilitation. According to the interviewed people, women with disabilities themselves are to blame for being excluded from family life, the reasons for this are varied but, first of all, they are connected with their apprehension and fear of being rejected, of shouldering responsibility and of coping with family duties; restrictions connected with disability, the external appearance and smaller attractiveness and lack of preparation for performing family roles, weak family ties, lack of support from family members are, in the experts' opinion, significant. Experts claim that disabled women ostracize themselves from social life, first of all, due to their appearance, complexes, shyness, low self – esteem, lack of communication skills, but they are also excluded due to mobility problems and the need to be assisted by third parties. Negative attitudes towards them and architectural, transport and financial barriers do not help handicapped women to socialize. Disabled women themselves withdraw from cultural life as they do not see any needs in this sphere, they lack mobility, they are dependent on others and they lack experience, which they should have gained

at home. Social, architectural, transport and financial barriers do not encourage women to participate in cultural life. In smaller towns and in villages there are no cultural offers adapted to the needs and possibilities of disabled people. Experts claim that in our cultural circles women with disabilities are not expected to engage in politics, as the features of handicapped women do not correspond with the image of public media people. The interviewed people emphasized the negative attitudes of the Polish towards disabled women, marked by lack of tolerance, lack of tolerance for otherness, the asexual treatment of disabled women as a homogenous group of unfit and defective citizens. It is difficult for disabled women to come to grips with the contemporary ideal of a woman, to counteract their negative social image and undermine the fact of being perceived through the prism of limitations as a uniform and homogenous group (deprived of sex and the right to independently fulfill social roles).

According to the interviewed people, it is usually the case that disabled women exclude themselves from social life for fear of being unsuccessful, due to being hampered by their deficiencies, inability to accept their own disabilities, shame and low self-esteem.

*Disabled women exclude themselves from social life due to their own limitations and the “non-explored” disability issue, often due to the lack of support and possibilities, for example, to use therapeutic or psychological services.*

Interview with the director of the social welfare center supervising nursing homes for the disabled

Disabled women are excluded, first of all, by employers (mainly men in the open sheltered labor market); by non-disabled people who lack the experience in communicating with the disabled and who do not understand their needs; by family members (due to mercy, shame and lack of time for the disabled person); by all those who do not give them a chance to demonstrate their abilities and who do not support them in pursuing their independence.

*Disabled women are excluded by employers due to the notions concerning potential problems connected with employing a handicapped woman. Institution and office employees exclude them by not undertaking sufficient actions to promote the image of a disabled woman, limiting access to services rendered by these institutions, lack of support in local communities due to a stereotypical perception of disability. The family*

*members exclude them due to their own attitudes and stereotypes about playing family roles by handicapped women – fear, disbelief, overprotectiveness.*

Interview with the director of the social welfare center supervising nursing homes for the disabled

The interviewed people emphasized that the real needs of women with disabilities are often not reflected in legal regulations, they have to overcome big obstacles to obtain the benefits guaranteed to them by the law, because the financial means for this purpose are limited and the procedures of applying for them are very complicated. The practitioners also remarked that disabled women had hindered access to information and legal advice. As the experts observed, there is hidden discrimination of women in the regulations (as a result of a lack of sex differentiation).

All the experts unanimously admitted that the situation of handicapped women could be changed, yet it is a long-term process and it requires the commitment of a lot of entities, institutions and people in miscellaneous actions.

*Creating a positive image of disabled women facilitates their inclusion into social life, that is why social attitudes have to be changed, people must get familiar with the problems of disabled women and a lot of people must be engaged in the campaign against their discrimination.*

Interview with the employee of the information center for disabled people at the district family support center.

*There must be complex actions beginning with the change through education and information concerning social attitudes towards disabled women and creating their positive image as persons who are able to independently function in life and to perform social roles. It is important to expand the offer of the psychological and legal assistance, provide them with self-esteem during therapy sessions, consultancy, social work and in the course of other pedagogical and psychological interactions; enhance work on accepting their own limitations, pursue their own development. Local authorities need to undertake actions to promote disabled women as normal and rightful members of the local community.*

Interview with the director of the social welfare center supervising nursing homes for the disabled

The inclusion process of women with disabilities requires, first of all, their involvement in various actions which activate them and facilitate their education and allow them to acquire new professional and social competencies. The interviewed people unanimously claimed that the most important issue is work on accepting one's own disability – one's own limitations, gaining education by disabled women, acquiring new competencies and skills, their own activity and motivation to act. It is indispensable to expand the offer of psychological, legal support for disabled women and to support them in strengthening their self-esteem within pedagogical and psychological interactions. The attitude of the environment should be positive for miscellaneous social initiatives integrating and activating disabled women. The state is to play a dominant role in supporting disabled women against discrimination, because it has the responsibility for passing legislative actions in favor of the legal protection of women with disabilities, say the experts. The local self-government, according to the practitioners, is responsible for the development and functioning of the institutional infrastructure and is obliged to provide disabled women with adequate access to it.

The needs of disabled people should be discerned at each borough level (especially the situation of women and children), the needs have to be determined and then adequate activation programs with the participation of families, non-governmental organizations and associations of disabled people are to be assigned to them. The task of the media is to promote initiatives, projects, actions in favor of women with disabilities in order to change the social attitudes towards them. The role of experts is to conduct examinations and analyses in order to identify the real needs of disabled women, work out strategies to act and submit them to social politicians in order to take up adequate actions at the local, regional, and state levels.

The role of the legislation is to improve the legal regulations and encourage employment of disabled women and improve their material and economic situation and thus the quality of their life.

## **Summary**

The interviewed practitioners identified miscellaneous factors which exclude disabled women – they can be divided into primary and secondary ones. The primary factors are the limited ability of disabled women to carry out tasks and the exaggerated exposure of their limitations and dysfunctions; the secondary factors are negative social attitudes towards them, first of all, perceiving them in a stereo-

typical way (as if deprived of sex, asexual, without the right to perform social roles in an independent way), which limits or hinders access of disabled women to a lot of spheres of social functioning. The area in which the social exclusion of women with disabilities most often takes place is the labor market, on which different discriminatory practices commonly occur.

The proposals of the interviewed people concerning inclusion actions in favor of disabled women referred to various entities – institutions and people. The interviewed people addressed most of the proposals to state authorities and regional administration bodies.

Positive attitudes towards women with disabilities, the elimination of stereotypical perceptions, viewing them through the prism of their possibilities and not limitations, facilitate their social inclusion. It is necessary to consider the needs of disabled women in different strategies and actions at the local, regional, national and international levels and also to maintain the principle of equality of chances between disabled men and women.

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## Quality of Life in Childhood with Congenital Heart Disease

### Abstract

The objective of this study is to identify the socio-educational needs in childhood with congenital heart disease. Our study was carried out using a multi-method, it combines quantitative and qualitative data collected in Catalonia (Spain). The results obtained from the questionnaires and interviews with education professionals, children with congenital heart disease and their families have enabled us to establish categories. Analysis of these has provided knowledge of their socio-educational needs. This article highlights the need to consider this impact as well as its psychosocial and educational effect, and the need to focus school education on improving their quality of life.

**Key words:** *health education, qualitative research, quality of life, congenital heart disease, family.*

According to the Ministry of Health of the Catalan Government (Departamento de Salut de la Generalitat de Catalunya, 2008), congenital complaints diagnosed at birth (in eight days old or younger babies) affected between 3% and 4% of babies in Catalonia-Spain between 2003 and 2005. In 2005, cardiological diseases were the second most common congenital complaint, accounting for 18.61% of all defects, and 15.15% of perinatal mortality was attributable to this problem. These data show the importance of early diagnosis and treatment, as in many cases it is possible to change the natural history of the disease. Various studies corroborate the need for early neurocognitive intervention (Griffin; Elkin; Smith-Clinton 2003)

Medical and surgical breakthroughs have increased the percentage of children with congenital heart disease (CHD) surviving the disease. It is considered a chronic pathology, and as a result such children require socio-educational initiatives to improve their quality of life (Shuman 1999; Grau 2004). The social and psychoeducational needs of children with CHD are directly related to the adaptation processes arising from the disease itself (Chen et al. 2003; Birkeland et al. 2005). Various studies show altered cognitive development among these children, especially in the areas of language (expression and vocabulary) and motor functions (hypotonia) (Miler et al. 1996), which can lead to limitations on function and on everyday life (Limperopoulos et al. 2001). In overall terms, this means that in the school environment, there is a decline in grades in academic skills related to reading and arithmetic (Wray and Sensky 2001). The child's psychological development is also affected: there are behavioral and emotional problems (insecurity, shyness and low self-esteem, among other problems) (Chen et al. 2006). Research shows the need to consider the impact of this pathology in the psychological, social and pedagogical fields.

The study by Spijkerboer et al. (2006) with 113 children with CHD aged between 8 and 15, shows lower scores in the areas of motor function, cognitive skills and in positive emotional function compared to the control group. Whereas the study by Wray (2006) also showed evidence of neurological, intellectual and developmental problems in children with CHD, who suffered from hypoxia with possible brain damage, as well as other aspects affecting their quality of life: low self-esteem, low height, poor social skills, among other things. However, according to the children and their parents (Krol et al. 2003), this population's quality of life is not related to the severity of the disease, but instead to the underlying physical and emotional complications that arise from it (Walker 2004).

The purpose of this study is to identify the socio-educational needs of children with CHD to focus educational action in nursery and primary schools on improving their quality of life.

## **Method**

### **Participants**

This study was carried out between 2004 and 2008, and included 73 families (two data gathering techniques were used on 10 families), 8 education professionals (4 teachers with experience in the field, and 4 specialized professionals with experience in care for diversity) and 9 children in primary education (between 6 and 12

years of age, in the lower, middle and upper cycle) with CHD in three provinces of Catalonia-Spain (Barcelona, Lérida and Tarragona).

The descriptions of the 10 families, professionals and children with CHD are presented in Tables 1, 2 and 3 respectively.

**Table 1.** Descriptions of the families interviewed

Interview (Code)	Attended by	Mother's age	Father's age	Mother's education/profession	Father's education/profession
F1	Father/Mother	39	40	Pharmacy/Pharmaceuticals	3rd year sec. school/Iberia airlines
F2	Father/Mother	36	41	Primary school/check-out operator	Primary school/Tax inspector
F3	Father/Mother	38	40	Graduate in Library Science/Librarian	Economist/Economics teacher
F4	Father/Mother	35	43	Auxiliary nurse	Clerk
F5	Father/Mother	38	39	Public relations/fashion salesperson	Economist/Business consultant
F6	Father/Mother	54	54	Housewife	Mid-level business management
F7	Mother	40	47	Sec. school/Civil servant	Prim. school/Business/workshop
F8	Father/Mother	46	50	Sec. school-Tourism studies/shop assistant	Prim. school/Waiter
F9	Mother	37	40	Prim. school/real estate agent	Prim. school/Machinist
F10	Mother	48	49	Education/Teacher	Philosophy/Head of Department

**Table 2.** Descriptions of education professionals interviewed

EDUCATION PROFESSIONALS				
Teacher/tutor of the child with CC				
Interview (Code)	Age	Year taught	Academic training	Time of teaching the student
P1	41	P4	Teacher training	2 years
P2	56	Primary 1	Teacher training	8 months
P3	46	Primary 6	Teacher training	2 years
P4	52	Primary 4	Teacher training	2 years

Specialized professionals			
Interview (Code)	Age	Job	Experience in dealing with diversity
P5	45	Teacher specializing in physical education in school	No experience
P6	54	Clinical psychologist in practice of educational psychologists	Extensive experience
P7	45	School principal	Extensive experience
P8	42	Educational Psychology Advisory team in regional service	Extensive experience

**Table 3.** Descriptions of children with CC interviewed

Interview (Code)	Age	School year	Repeating year	People living in the home	No. of siblings / Position among siblings
Ch1	7 years	Primary 2	No	Parents and siblings	1 / 2nd
Ch2	12 years	Primary 6	No	Parents	2 / 3rd
Ch3	7 years	Primary 1	No	Parents, siblings and baby-sitter	1 / 2nd
Ch4	9 years	Primary 4	No	Parents and siblings	3 / 2nd
Ch5	8 years	Primary 3	No	Parents and sister	2 / 2nd
Ch6	6 years	Primary 1	No	Parents and siblings	2 / 2nd
Ch7	11 years	Primary 6	No	Parents and brother	1 / 1st
Ch8	10 years	Primary 5	No	Parents and brother	1 / 2nd
Ch9	8 years	Primary 2	No	Parents	Only child

The sample consisted of participants belonging to the Association for Help to those Affected by Children's Cardiopathies in Catalonia (AACIC), the mothers of the children admitted to the "Vall d'Hebron" Maternity and Children's Hospital in Barcelona and the "San Juan de Dios" Hospital in Barcelona facilitated access to the sample.

### Instruments

An interview was designed for education professionals (teacher/tutor of the child with CHD and specialized professionals), children with CHD and their families but a questionnaire was also designed only for the families.

The *interview* was produced as follows: Identification of the content; writing and categorization of the questions in the interview (open questions according to

content) and writing of guidelines for administration (a semi-structured interview, in which the interviewer can adapt the conversation, the form and order of the questions, as the priority is to achieve an informal and spontaneous dialogue). The following factors were taken into account: the objectives of the interview and the use to be made of the information from them were clarified, and it was emphasized that there were no correct or incorrect answers, as we were interested in finding out opinions in order to make improvements. A pilot test was carried out to determine which aspects could be improved and to establish the final wording. Four scripts for semi-structured interviews were produced, based on the population concerned: children, families and education professionals (cf. Table 4).

**Table 4.** Aspects covered in interviews with families and education professionals and children with CC and questionnaire with families

<b>INTERVIEW WITH FAMILIES</b>
Data for parents related to age, profession, education and genogram
<ul style="list-style-type: none"> <li>- Needs of the family and feelings-expectations of parents</li> <li>- Needs of the child with cardiopathy</li> <li>- Schooling</li> </ul>
<b>INTERVIEW WITH THE TEACHER</b>
Data on the academic year, training of the teacher, experience and time with student
<ul style="list-style-type: none"> <li>- Social relations</li> <li>- Adaptations of curriculum</li> <li>- Educational resources</li> <li>- Performance</li> <li>- Pace of learning</li> <li>- Assistance</li> <li>- Physical conditions of the school</li> <li>- Social climate</li> </ul>
<b>INTERVIEW WITH OTHER SPECIALISED PROFESSIONALS</b>
Data on the professional's training and centre where he/she works, and his/her experience.
<ul style="list-style-type: none"> <li>- Perception of how he/she thinks the congenital cardiopathy affects the child's learning process</li> <li>- Information / education on the disease.</li> <li>- Strategies for action used and results</li> <li>- Cooperation from the child, classmates, family and other professionals</li> </ul>
<b>INTERVIEW WITH CHILDREN WITH CC</b>
Data on the child related to age, family and school
<ul style="list-style-type: none"> <li>- Motivation</li> <li>- Self-image</li> </ul>

<ul style="list-style-type: none"> <li>- Style of confrontation</li> <li>- Adherence to treatment</li> </ul>
<b>QUESTIONNAIRE WITH FAMILIES</b>
<ul style="list-style-type: none"> <li>- Close and open questions related to the family, the diagnostic process, hospitalization, surgery, information received and available, adaptations and difficulties at school and in leisure activities</li> </ul>
<ul style="list-style-type: none"> <li>- Another information (Close-questions): Information received, difficulties, worries, behaviors and learning</li> </ul>

The following steps were used in producing the *questionnaire*: Identification of the most important variables based on documentary analysis and the answers to the pilot test in the interview with the families. The questionnaire consisted of nine open questions related to the family, the diagnostic process, hospitalization, surgery, information received and resources available, adaptations and difficulties at school and in leisure activities (cf. Table 4).

### Procedure

The data gathering procedures in the interviews were carried out by the researchers using the following criteria for inclusion: 1. There had to be at least two children per educational cycle: the lower, middle and upper cycle. 2. The cognitive level had to be sufficient to understand the questions asked, meaning that the decision was not to interview children in nursery education. 3. The children's parents had to be willing to answer the family interview. 4. The teachers and education professionals had to be available to answer the questions. The interviews were carried out on neutral ground (at the Association for Help to those Affected by Children's Cardiopathies in Catalonia, offices and education centers) and were recorded by voice recordings, and transcribed literally.

The data in the family *questionnaires* was gathered by researchers using three means of access, which we present here in ascending order of difficulty, to obtain a representative sample for the study: 1. returning the questionnaire by registered post, with a postage paid envelope provided; 2. in the waiting rooms of the outpatient surgeries of the pediatric cardiology services at the "Vall d'Hebron Maternity and Children's Hospital" and the "Sant Joan de Déu Children's Hospital" in Barcelona, and 3. by telephone. In all the three cases, a letter of authorization was included in the questionnaire, which was collected in person or electronically, in which the family gave its informed consent for the research data to be used.

## Data Analysis

Data analysis intentionally used a methodological approach allowing an open structure, in order to redefine the needs arising from the research as well as building a flexible tool suitable for the objectives, the context in which they were set and the data collection instruments used. The information was analyzed using two complementary approaches: content analysis and descriptive analysis. Content analysis took place using data from the *interviews*, using the program ATLAS. TI-V. 5.0 in professional QDA software (*Qualitative Data Analysis*). The objectives and indicators taken from the evidence made up the core working area of the program. The *Hermeneutic Unit Editor* was created, which included the data, reflections, codes, memos and conceptual structures. The audio data files (*Primary Documents*) were associated with the Hermeneutic Unit in order to compare the coded data with the same or different codes. Codes or memos were subsequently assigned to the passages of text. Finally, semantic or terminological networks were constructed using the codes created. These networks, and the codes, metacodes and memos were the basis for the theoretical generation of the results (cf. Table 5).

**Table 5.** Categories, examples of the categories analyzed and sample

CATEGORY	EXAMPLE WITHIN THE CATEGORIES ANALYSED	SAMPLE
School performance	“In general, performance is affected in terms of work, habits, the family situation, lack of attention etc; there are many varied factors. In specific terms, children with cardiopathies: the time they spend in hospital as they can be away for two months and it can be a disaster when they come back”.	Primary 6 Teacher
	“What is most difficult for me are the rolls in physical education”.	Boy, 3rd year primary school
Pace of learning	“It depends on each person’s efforts, their capabilities and the help given to them. With the child, it depends on whether his or her life is completely controlled by the disease, whether he or she is very ill and the medication he or she has to take”.	Primary 6 Teacher
Curriculum adaptation	“... there are some sessions that are very well adapted for her, if they are stretching and adaptation and things like that, but those requiring more stamina and speed, you have to adapt them a bit. ... I don’t let her rest, by which I mean sit down, but instead she walks or runs but more gently... she can do the classes, although not at the same pace all the time.”	Lower Cycle Teacher
	“Sometimes they make me rest when I’m all right, before I get tired or when I’m a bit tired and go round the playground”. “They don’t ask me to do the same as my classmates in physical education, because I’ve got a bad heart”.	Boy, 5th year of primary school

Educational resources	“For example, when he is absent a lot they give him two hours of math and Catalan daily, but it doesn’t take into account the time spent by the person who prepares it. This child still has half a cycle to pass, but when I asked his parents they didn’t want him to repeat the year, because his family is more concerned with the social side rather than academic issues”.	Primary 6 Teacher
	“I have a problem with the physical and architectonic aspect, which won’t be a problem next year because they’ve promised us a lift up to the floor; so there won’t be any problems. Now, when the girl arrives... we’ll do what we can”.	Nursery Education Tutor
School attendance	“The operation and recovery did not affect her school life. We were able to choose when the operation took place. We did it on the last day of June and we had July and August to recover”	Mother of a girl in the 4th year of primary school
Social relations	“For example, in the physical education they can’t do, in relationships, that part that the children can’t do.... It isolates them from relating to others”.	Professional Psychoeducational Advice Team
	“I couldn’t make an effort. Once I tried to carry a very heavy file and they carried it for me”.	Girl, 3rd year primary school

Descriptive analysis was carried out with the data from the *questionnaires*, using the program SPSS-V. 15 (*Statistical Package for Social Sciences*) and the parameters of frequency, mean and standard deviation were obtained.

## Results

This article presents the results obtained in the interviews and questionnaires with the families, education professionals and children with CHD, on the socio-educational needs of children with CHD. Six categories were established within this dimension: *school performance*, *pace of learning*, *curriculum adaptation*, *educational resources*, *school attendance* and *social relationships*. Table 6 shows an example of each category illustrated by the data.

### School performance

The *families* reported that their children’s performance did not differ from that of their peers; in one specific case the parents of a child with CHD claimed that their child performed better. For other parents, performance-related problems did not arise at school but instead at home, when doing homework. In one particular case, the parents said their daughter was slower in finishing her schoolwork. In short,

children with CHD showed a wide variety of responses to the various learning areas in which they had difficulties, and presented the same difficulties as their peers. In the opinion of the *education professionals*, the school performance of children with CHD was affected by periods of absence due to hospitalization and medical check-ups, among other factors due to: the evolution of the disease, the number and type of operations. As for the school performance of *children with CHD*, only one of the girls interviewed said she had difficulty doing somersaults in physical education.

### **Pace of learning**

Some *families* referred to their children's difficulties in following classes and general enjoyment. Two families said that the pace of learning is slower, one in overall terms and the other with regard to the processes of reading, problem solving, written language and development of psychomotor activity.

Meanwhile, some of the *education professionals* stated that the pace of learning is slower in children with CHD, due to the medication they have to take and the disease itself. However, one professional in the Nursery Education cycle was of the opinion that the pace of learning among children with CHD depends on factors that are not necessarily related with the disease. In one case, stimulating the pace of learning using the student's self-esteem was proposed. The *children with CHD* did not mention this category.

In short, there is agreement on slowness in doing schoolwork, although there is a disparity of opinions among the education professionals as to the reasons for this.

### **Curriculum adaptation**

Two of the *families* interviewed said that their children needed no adaptation of any kind. In one specific case, the parents said that the only adaptation needed was in physical education. In this respect, they said that they saw positive results after the curriculum had been adapted. The *education professionals* were of the opinion that children with CHD did not require adaptations to the curriculum, and if these were needed, it was in physical education, in terms of the degree of effort, stamina and speed. However, they said that no adaptations had been made to stretching, warm-up activities and floor activities.

These same professionals stated that when carried out, they need to be more closely related to the personal characteristics of the students. The professionals reported that they had not made any curriculum adaptations in terms of objectives and contents. One of the *children with CHD* specifically mentioned the adaptations for him in the physical education class.

In short, although general adaptation of the curriculum is not always considered necessary, adaptation of some aspects of physical education does seem to be a clearer issue.

### **Educational resources**

A distinction was made between different types of educational resources: human, structural and organizational.

The *parents* said that having the human and structural resources was positive for their children, and described psychologists and teachers, among others, as human resources, and infrastructure, ramps and lifts as structural ones. Among human educational resources, the *education professionals* mentioned the Psychoeducational Advice Team (EAP), caregivers, educators and special needs teachers, and on one occasion referred to the need for special educational resources during school trips. They also mentioned structural educational resources on two occasions. The structure of the school, and particularly the stairs, was mentioned on two occasions, as it was a difficulty for these children, and they highlighted the need for a lift in the school. In some cases, the education professionals remarked that the school organization should be adapted to the needs of the students (organization of the assignment of spaces, making travel possible, adoption of an emergency plan). The *children with CHD* made no reference to this category.

We found that the various groups of participants all mentioned various types of educational resources adapted to the particular needs of each child.

### **School attendance**

The *family* emphasized that when the surgery had taken place during a holiday period, the interference due to absence from school was minimized. The *education professionals* said that this depended on each case; sometimes these children attended regularly and were only absent for medical checkups, and on other occasions, the periods of absence were longer due to hospitalization. The *children with CHD* made no comment on this category.

### **Social relationships**

The *families* felt that the social relations were very positive at school, and with the peer group and teachers in particular. The *education professionals* were of the opinion that relations with peers depended more on the personality and social skills of the child with CHD concerned than on their illness. They mentioned overprotection and isolation in the physical education class as an influence. The *children with CHD* said they had good relations with their teachers and

peers, and received help when undertaking school activities with which they had difficulties.

## **Discussion**

Our research showed socio-educational needs among children with CHD. It is essential to be aware of these and to improve the quality of life, thereby once again demonstrating the results obtained by other authors in their research (Walker et al. 2004; Wray and Maynard 2005; Goldbeck and Melches 2006, 2005).

These needs are perceived differently depending on the person interacting. Even though they are all different, they are all focused on achieving patterns of normality in everyday life from the academic/educational and social/relational perspective.

When the education professionals refer to the needs of the child with CHD in a school context, they particularly emphasize their physical needs in order to prevent risk situations, especially in terms of adapting the organization and the physical conditions of the school to their characteristics. Conclusions along these lines were mentioned in the study by Howard et al, which highlights the importance of the school atmosphere, and the strategies used to adapt to the needs related to the health of these children (Taras and Brennan 2008).

These results suggest the relationship between physical activity and school performance, as mentioned by Chomitz et al. (2009) in their study of physical fitness and academic achievement. The results of our study clearly show a wide variety of responses in terms of the various learning areas which this population presents.

Likewise, in our research both the families and education professionals felt that the pace of learning of the child could be slower, due to medication, the disease itself and hospitalization, absences from school due to the development of the illness, and the number and type of surgical procedures. Wray and Sensky (2001) reinforce these conclusions in their study of the effects CHD on cognitive function and academic capacity after cardiac surgery in children with CHD.

## **Limitation**

Our study contributes to the knowledge of the educational focus and work done in the school, although it does have two limitations. The first one is in terms of the sample, due to the difficulty of access to interviewees, various agents involved, which is in all likelihood due to the illness they suffer from. The second limitation

concerns the results obtained with regard to academic/school performance, and the benefits of coordination between the agents involved. With regard to the latter, other studies (Evans et al. 2008; Lawoko and Soares 2002) contribute to describing the importance of coordination between those interacting with the child or young person with CHD.

In other studies, the school performance by students with CHD did not change only in terms of the place of learning, expressed in terms of the speed of processing knowledge, but also in terms of deficiencies in visual, spatial and motor skills (Griffin et al. 2003) and in the delay in growth and premature development (Chen et al. 2003).

## **Conclusion**

The needs analysis of children with CHD in this article has highlighted the importance of the physical, psychosocial and educational impact of hospitalization and surgery.

It is essential that all the agents involved are aware of these needs and their impact to benefit the quality of life of children with CHD and that this is in turn coordinated between all the people involved, education and healthcare professionals, families and the children with CHD themselves.

### **Implications for school health**

Congenital heart disease is one of the most frequent anomalies in children, leading to specific socio-educational needs. These needs are identified in the study in order to focus educational work at school and hence to improve their quality of life.

### **Human Subjects Approval Statement**

The research is approved by the following institutions: Rovira i Virgili University, University of Barcelona, University of Lleida and Autonomous University of Barcelona. The participants in the research, including families, children and teachers, have agreed to include the information in the article.

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## Self-education of Students of Pedagogy and Their Social Roles

### Abstract

The article presents the results of research on the relationship between the way in which students of pedagogy understand self-education and perform their social roles. In the research, the social roles of a worker, a parent and a student (duration of studying) were taken into account. The analysis used was three-way ANOVA.

**Key words:** *self-education, social roles.*

### Preface

The concept of self-education can be understood in a narrow and wide ways. In the narrow sense, it relates to the intellectual development of one's personality. In the broad sense, it applies to the whole development of human personality and is equated with the concept of self-upbringing. In broad terms, self-education takes place in all areas of man's life activity. It may relate to areas such as, e.g., intellectual, social – moral, art – aesthetic areas or the field of everyday life (C. Maziarz, 1966, p.24). Self-education in the broad sense may be a part of human lifestyle. It relies not only on looking for opportunities to learn in conditions in which man lives, on adaptation to living conditions. It also involves, perhaps most importantly, active modification of these conditions in such a way as to conduce the development of an individual (D. Jankowski, 2006, p.61). Self-education can be understood as “a learning process carried out deliberately, with the possibility of using different forms of help from other people or institutions. It is a process of self-managed learning, the objectives, contents, forms, sources or methods of which are selected and

determined by the learner” (J. Pólturzycki, 2002, pp.209–210). In 2008, I conducted a study on self-education that was a wide concept, as a part of the lifestyle of students of pedagogy. The factor analysis of the collected data allowed to distinguish five different ways of students’ self-education (A. Kozerska, 2008). These are:

**The first factor:** Learning that has its source in the interest in current, cultural, political and scientific events,

**The second factor:** Learning through the implementation of tasks assigned by teachers,

**The third factor:** Learning through meetings and cooperation with others,

**The fourth factor:** Learning on one’s own (without the company of other people) about areas not related to the studied specialization (gaining knowledge, skills, work on one’s own character),

**The fifth factor:** Learning on one’s own (without the company of other people) about areas related to the studied specialization exceeding the topics discussed in class.

Depending on the areas that are dominant in the case of a person, one can talk about various lifestyles of students connected with self-education, or about self-education styles.

**The concept of a social role** is defined in different ways. Znaniecki (1974, pp.110–111) understands it as a “personal model”, Szmatka (1980) defines a social role as a “system of interpersonal behaviors of individuals”, while Poznaniak (2000, p.90) understands this term as “a collection of diverse requirements and regulations relating to the way in which a person occupying certain social positions should behave”. The functioning of an adult in society is determined by the roles he/she takes. At every stage of life, an individual participates in various social roles. One can talk about a complex of roles specific to different stages of human life. Human activity during early adulthood focuses on personal life, family and work. Individuals studying at university function as students and this role is associated with learning within the studied specialization under the supervision of a university teacher and with self-education in this field. A studying adult can operate in several other social roles, which include, among others, the role of a wife / husband, the role of a mother / father, the role of a worker, the role of a daughter / son. Providing a number of roles at the same time may lead to a role conflict. The conflict arises when the demands of each role are mutually exclusive, which prevents the realization of each of them in a satisfactory manner (Szmatka, 1974, p. 77). It can be assumed that the performance of different social roles by students depends on how they understand self-education. Besides, learning of a social role can be educational. It may stimulate educational activity, and affect the lifestyle of an individual.

## **Aim of the research**

The aim of the research was to determine the relationship between the fulfillment of social roles by students and their self-education activity.

In the analysis, the roles of a worker, a parent and a student were taken into account. It was tested whether students performing these roles (or in the case of the role of a student – performing this role for more than three years) differ in terms of self-education from students who do not act as a worker or a parent, and in the case of the role of a student – performing this role for a short time – three years at the longest. The study, conducted in January 2008, included 244 students of pedagogy at Jan Długosz University in Czestochowa. All the respondents were studying in the extramural system. For measuring the activity of student self-education, a questionnaire was used containing 22 statements. Each examined person, on a scale from 1 to 5, determined the extent to which a statement described his/her daily behavior connected with conscious initiation of the learning process. These are some examples of statements that made up the questionnaire: “*I regularly read scientific or popular – scientific magazines*”; “*I’m interested in political problems of my country and the world*”; “*In my free time I regularly read belles-lettres*”; “*I spend a lot of time preparing for classes at university*.” Self-education was therefore examined from the students’ perspective. The statements in the questionnaire were grouped according to the results of factor analysis performed on the data derived from the questionnaires completely filled by the respondents (cf. Kozerska, 2008). Each factor, separated in this way, is one of the ways of the students’ self-education and is analyzed later in this article.

In order to test the hypothesis that the social roles students play differ depending on the way in which they understand the self-education process, three-way analysis of variance was conducted in the scheme 2 (Job: working, not working) x 2 (Mother / father: has children, has no children) x 2 (Student: length of study up to 3 years of study, length of study over three years). As dependent variables, five ways of self-education were adopted.

## **Results of the research**

The students performing different social roles will be compared in terms of self-education within each of the five factors. Data analysis was performed on standardized data<sup>1</sup>.

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<sup>1</sup> Within each of the factors for all respondents: M=0, SD=1

### 1. Learning that has its source in the interest in current, cultural, political and scientific events (factor 1)

This kind of self-education deals with issues related to participation in cultural events, reading popular-scientific and scientific, or journalistic-informative magazines, watching popular-scientific and scientific television programs. The analysis takes into account the level of interest, declared by the students, in political problems of their country and abroad and the level of cognitive involvement they have when going on a trip.

**Table 1.** Self-education in current, political and scientific events, and social roles performed by students – descriptive statistics

Worker	Mother/father	Student	Number of people (N)	Factor 1	
				M	SD
Yes	Yes	1–3 years	25	0.29	0.98
		4–5 years	25	0.18	0.99
	No	1–3 years	63	-0.04	1.02
		4–5 years	65	-0.06	0.94
No	Yes	1–3 years	6	-0.06	1.40
		4–5 years	4	-0.33	1.94
	No	1–3 years	22	-0.27	0.83
		4–5 years	15	0.07	0.96

**Table 2.** Self-education in current, political, scientific events and social roles performed by students – the results of the ANOVA

Source of variance	df	MS	F	p
WORKER (A)	1	1.45	1.44	0.23
MOTHER/FATHER (B)	1	0.22	0.22	0.63
STUDENT (C)	1	0.01	0.01	0.94
AxB	1	0.96	0.96	0.33
AxC	1	0.06	0.06	0.80
BxC	1	0.76	0.76	0.38
AxBxC	1	0.43	0.43	0.51
Error	217	1.01		

The obtained results do not confirm the relationship between the social roles performed by the examined students and their self-education within the area.

The views expressed by the respondents on the extent to which learning takes on current political, cultural and scientific issues, have no connection with their professional work, having children, and there is no connection between the students' length of study and self-education in the considered area.

## 2. Learning through the implementation of tasks assigned by academic teachers (factor 2)

The statements related to this factor are connected with the students' systematic learning of what they discuss in class, use of many sources of information during preparation for classes, amount of time spent preparing for classes.

**Table 3.** Self-education related to the implementation of tasks assigned by academic teachers and social roles performed by students – descriptive statistics

Worker	Mother/father	Student	Number of people (N)	Factor 2	
				M	SD
Yes	Yes	1–3 years	24	0.52	0.84
		4–5 years	24	0.14	1.07
	No	1–3 years	64	–0.17	1.01
		4–5 years	66	–0.21	0.98
No	Yes	1–3 years	7	0.71	0.96
		4–5 years	4	0.21	1.56
	No	1–3 years	24	0.34	0.84
		4–5 years	15	–0.28	1.05

**Table 4.** Self-education related to the implementation of tasks assigned by academic teachers and social roles performed by students – the results of the ANOVA

Source of variance	df	MS	F	p
WORKER (A)	1	0.81	0.84	0.36
MOTHER/FATHER (B)	1	6.02	6.20	<b>0.01</b>
STUDENT (C)	1	3.94	4.06	<b>0.05</b>
AxB	1	0.05	0.05	0.82
AxC	1	0.80	0.83	0.36
BxC	1	0.08	0.08	0.78
AxBxC	1	0.36	0.37	0.55
Error	220	0.97		

The results showed a statistically significant main effect of the variable MOTHER/FATHER and the variable STUDENT. This means that the students acting as mother or father are different from the students not performing this role in terms of involvement in self-education related to the implementation of tasks assigned by academic teachers. The persons acting as a parent describe themselves as more involved in preparing for classes than the persons with no children.

The average score in the group of parents is  $M = 0.40$ , whereas in the group of childless persons  $M = -0.08$ . A relationship between the length of studying and the involvement in self-education within the second factor was found. The students with a shorter length of study (three years at the longest) described themselves as more involved in preparing for the course ( $M = 0.35$ ) than the students with longer experience of studying ( $M = -0.04$ ).

### 3. Learning through meetings and cooperation with others (factor 3)

It is participation in various social, political or religious organizations, devoting time to voluntary work, and participation in events of touring, and participation in organized training courses.

**Table 5.** Self-education connected with meetings and cooperation with others and social roles performed by students – descriptive statistics

Worker	Mother/ father	Student	Number of people (N)	Factor 3	
				M	SD
Yes	Yes	1–3 years	26	0.22	1.10
		4–5 years	27	-0.01	0.87
	No	1–3 years	62	-0.05	0.99
		4–5 years	66	0.08	1.08
no	Yes	1–3 years	6	-0.4	0.69
		4–5 years	4	-0.43	1.08
	no	1–3 years	21	-0.47	0.51
		4–5 years	14	0.17	1.10

As the data in Table 6 show, the students working professionally differ significantly from those not working in terms of involvement in the activity of self-education within the third factor. The persons acting as workers describe themselves as more involved in this area ( $M = 0.06$ ) than those not employed ( $M = -0.28$ ).

**Table 6.** Self-education connected with meetings and collaboration with others and social roles performed by students – the results of ANOVA

Source of variance	df	MS	F	p
WORKER (A)	1	2.87	2.94	<b>0.09</b>
MOTHER/FATHER (B)	1	0.20	0.20	0.65
STUDENT (C)	1	0.43	0.44	0.51
AxB	1	0.82	0.84	0.36
AxC	1	0.80	0.82	0.37
BxC	1	1.65	1.69	0.19
AxBxC	1	0.15	0.16	0.69
Error	218	0.98		

#### **4. Learning on one's own (without the company of other people) about areas not related to the studied specialization (gaining knowledge, skills, work on one's own character) – factor 4**

The next considered area is connected with self-studying of books whose subject matter is different from the studied specialization, taking up systematic, independent learning, which is not associated with the specialization of studies. In addition, this factor is composed of systematic reading of literature and an interest in film.

**Table 7.** Self-education relating to areas unrelated to the studied specialization and social roles performed by students – descriptive statistics

Worker	Mother/ Father	Student	Number of people (N)	Factor 4	
				M	SD
Yes	Yes	1–3 years	24	0.36	0.94
		4–5 years	26	-0.22	0.96
	No	1–3 years	65	-0.01	1.03
		4–5 years	65	0.15	1.00
no	Yes	1–3 years	7	-0.37	1.05
		4–5 years	4	-1.07	0.69
	no	1–3 years	22	-0.24	0.81
		4–5 lat years	15	0.14	1.06

**Table 8.** Self-education relating to areas unrelated to the studied specialization and social roles performed by students – the results of ANOVA

Source of variance	df	MS	F	p
WORKER(A)	1	5.39	5.55	<b>0.02</b>
MOTHER/FATHER (B)	1	2.97	3.06	<b>0.08</b>
STUDENT (C)	1	0.88	0.91	0.34
AxB	1	2.90	2.99	<b>0.09</b>
AxC	1	0.03	0.028	0.87
BxC	1	5.37	5.53	<b>0.02</b>
AxBxC	1	0.17	0.18	0.67
Error	220	0.97		

The conducted analysis showed a statistically significant main effect of the variable WORKER. The students acting as a worker to a greater extent are involved in independent learning including areas unrelated to the studied specialization ( $M = 0.07$ ), compared to non-working persons ( $M = -0.39$ ). There was also a main effect of variable MOTHER / FATHER. The students acting as mother or father, to a lesser extent take the activity within factor 4 ( $M = -0.33$ ) compared to those without children ( $M = 0.01$ ). It was also observed that there was an interaction between variables WORK and MOTHER / FATHER. The persons not working and having children are clearly different from the other examined groups – they take up self-education in the areas that are not connected with the studied specialization the least ( $M = -0.72$ ). There is also a statistically significant interaction effect between the variables MOTHER/FATHER and STUDENT. The students with a shorter length of studying who have children are similar in terms of self-education activity in the area related to factor 4 ( $M = -0.01$ ) to the students with a shorter length of studying without children ( $M = -0.12$ ). However, those studying longer (more than three years) with children rather not engage, or engage to a small degree in learning something that is not connected with the studied specialization ( $M = -0.65$ ). This group differs significantly from the others. The students with long experience of studying who are childless take self-education within factor 4 to an extent similar to those with a shorter length of studying ( $M = 0.15$ ).

### 5. Learning on one's own (without the company of other people) about areas related to the studied specialization exceeding the topics discussed in class – factor 5

Self-education consists of independent forms of activity that go beyond the requirements of teachers for studying students: the study of books related to the field of their studies, greater knowledge about the learning methods and systematic improvement of methods of studying.

**Table 9.** Self-study in the areas related to the studied specialization beyond the topics discussed in class and social roles performed by students – descriptive statistics

Worker	Mother/father	Student	Number of people (N)	Factor 5	
				M	SD
Yes	Yes	1–3 years	24	0.50	0.81
		4–5 years	27	0.01	1.01
	No	1–3 years	64	-0.11	0.99
		4–5 years	64	0.02	1.00
no	Yes	1–3 years	6	0.38	0.82
		4–5 years	4	0.53	2.01
	No	1–3 years	22	-0.24	0.83
		4–5 years	14	-0.44	1.06

**Table 10.** Self-study in the areas related to the studied specialization beyond the topics discussed in class and social roles performed by students – the results of ANOVA

Source of variance	df	MS Effect	F	p
WORKER(A)	1	0.06	0.06	0.81
MOTHER/FATHER (B)	1	7.64	7.84	<b>0.01</b>
STUDENT (C)	1	0.24	0.25	0.62
AxB	1	1.54	1.58	0.21
AxC	1	0.14	0.15	0.70
BxC	1	0.14	0.14	0.71
AxBxC	1	1.48	1.52	0.22
Error	217	0.98		

As shown in Table 10, analysis of variance allowed to detect the main effect of the variable MOTHER / FATHER. The examined people acting as parents described themselves as more involved in self-education in the area related to the studied specialization and beyond the topics discussed in class ( $M = 0.36$ ). For comparison – in the group of childless people  $M = -0.20$ .

## **Conclusion**

The study looked for determinants of self-education of pedagogy students. The independent variables associated with the type of social roles were taken into account. The analysis showed that the students acting as parents (28% of the tested group) significantly differed in terms of self-assessment when talking about self-education from the people not performing this role in society. The students – parents to a greater extent than the childless ones considered themselves as engaged in self-education related to the studied specialization. They saw themselves as people devoting a lot of time to preparation for classes and performing tasks assigned by teachers. The students – parents described themselves as engaged in independent learning related to the specialization they study that goes beyond what happens in the classroom. Perhaps this is somewhat related to the specialization which they study – studying pedagogy helps in learning the role of a family member. Currently, acting as a parent requires continuous training, inter alia, in pedagogy and psychology. Such knowledge can be gained not only during classes connected with the studied specialization. Distributors of such knowledge are different types of educational publishers, but also the media, friendly people, teachers. Such knowledge can also be gained in everyday situations and in contact with one's own child. The students – parents more rarely than the childless students take self-study that is not connected with their studied specialization. They read books whose subject matter is different from what they study more seldom. To a lesser extent than the childless students they are interested in film. Taking into consideration that the average age of all the respondents' children is 4.9, when some of the examined students have two or three children, it can be expected that this situation may be due to lack of time for this type of activity. In situations where performing at the same time the role of a parent, a student, and – often – a worker, self-education in the field unconnected with the studied specialization is the luxury which many people cannot afford.

The students acting as workers were 77% of the sample group. To a greater extent than the students not working professionally, they described themselves as

individuals involved in the process of self-study in areas unrelated to the studied specialization. They are more likely to read literature and are often interested in the theatre, they go to art exhibitions or to the concert hall. The effect of the interaction between the variables WORKER and MOTHER/FATHER is interesting. It turned out that the students with children, not working professionally, rather did not take up (or did it to a very small extent) systematic self-study in areas not related to the studied specialization. However, the students with children, working professionally, were very similar in terms of self-education activity unrelated to this specialization to the working and childless people, and not working but the childless ones. For the people with children work seemed to be a motivating factor in their effort in learning. Taking into account the age of the respondents, one can say that they are just beginning their careers, do not yet have professional experience, they are required to keep improving their knowledge, which allows for solving practical problems they face. This knowledge is not only deepened on their own (without the company of other people) but also in collaboration with others. As the analysis of the data shows, the people working professionally often participate in organized courses and training. More often than not working students they are members of social, political, religious organizations, and, more often than not working people, they devote their free time to volunteer work.

Another social role considered in the article is the role of the student, and more generally – the amount of time they act in this role (length of studying). This variable differentiates the individuals when talking about self-studying related to the implementation of tasks assigned by teachers. The students with longer experience of studying (48%) describe themselves as less involved in this type of learning compared to those entering college. The students with more experience of studying focus less on the obligatory sphere of a student, to a lesser extent, their attention is focused on taking up their duties in this role. In the area of learning that goes beyond the guidance of teachers, they are similar to the students with a shorter length of studying. As far as self-study unrelated to the studied specialization is concerned, the interaction between the variables STUDENT and MOTHER / FATHER looks interesting – in this type of person at least engage the students with long experience of studying, having children.

Social roles performed by students do not differentiate them in terms of self-study in the current political, cultural and scientific areas. It is the only one of the highlighted areas of self-education which has no connection with such independent variables.

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## The Sense of Pedagogical Self-Efficacy of Parents at Varied Levels of Gender Role Development

### Abstract

This article focuses on the question concerning the significance of the differences between the statistical average of parents' sense of pedagogical efficacy with regard to their level of gender role development. Quantitative strategy, theoretical exploratory type, experimental schematic, data collection methods: situational and paper-pencil testing, random sample selection, data analysis: one-way ANOVA – these are the main methodological parameters of this study. The result shows that the level of gender role development explained over 19% of the variation in the sense of efficacy.

*Key words: gender role, development, pedagogical self-efficacy, parents, children, education.*

### Empirical Context and Theoretical Basis for Research

The idea for the research topic formulated above came about as the result of a critical analysis of research which I previously carried out and published elsewhere (Rubacha 2009, pp. 240–248). Briefly, something about this research: I designed it as a study in a quantitative strategy, exploratory in an experimental schema. In a statistical sense, it was based on the Three Way Analysis of Variance (ANOVA) model. The dependent variable was the parents' sense of pedagogical efficacy, and the parents' age, sex, as well as level of self-realization were considered within its scope. I expected three main effects on the dependent variable, age, sex, and level of self-realization, adding to them simple effects and the following four

interactive affects: age x sex x level of self-realization, age x level of self-realization, sex x age, and sex x level of self-realization. The results, however, yielded two main statistically significant effects: age and level of self-realization, as well as the interaction of these two variables. In total, age explained 19.5 % of the variation in self-efficacy, the level of self-realization accounted for 6.98%, while the interaction of these two factors accounted for 58.8%. What particularly aroused my suspicion was the lack of any influence of sex. Sex, of course, was in this study defined in a physical sense and measured on the basis of national identification numbers as declared by the participants. Later, after publishing the study, I realized that if a man reveals himself in a self-description to have the majority or even half of the characteristics typical of females (or vice versa), then we are not necessarily studying what we think we are studying. Thus, the discrepancy between sex and gender can act as a confounding variable in a statistical model of the examined phenomenon.

In this manner, the general problem formed the basis for several new research questions. In the present article, I will focus on one of these, that is, the question concerning the significance of the differences between the statistical average of parents' sense of educational efficacy with regard to their level of gender role development.

The level of gender role development is a variable derived from Block's theory (Block 1976, pp.63–78), itself an extrapolation of Loevinger's theory of ego development (Loevinger, Wessler 1976) in areas connected with femininity and masculinity in Bakan's understanding. Bakan described two cultural modalities associated with the performance of social roles, which emerge from studied self-descriptions as stereotypical male and female characteristics. Femininity is described by such adjectives as: dependent, submissive, sensitive, unstable, focused on family life, allocentric, etc. Masculinity, on the other hand, is described respectively by: independence, insensitivity, stability, domination, focus on the world external to the family, egocentrism (Bakan 1966), etc.

J. Loevinger, on the other hand, distinguishes seven developmental stages of ego identity: the pre-social, the impulsive, the self-protective, the conformist, the conscientious, the autonomous, and the integrated. The simple distinction between "I" and "not I" corresponds with the first three stages. The conformist stage is defined by intensive learning to respond to the expectations of social groups, as well as building identity modeled on influential people. The conscientious stage is defined by an attempt to go beyond the previously assimilated patterns in the direction of one's own preferences. However, this attempt proves unsuccessful because it bases itself on the fear of rejection. Still, it signifies the beginning of becoming

aware of one's individuality. The autonomous stage is reached when this process gains enough momentum so that the individual is able to exhibit his or her own individuality, thereby attaining the integration of all the elements, both social and individual, of the ego. This integration creates a unique identity, the mature identity of the individual (Loevinger, Wessler 1976).

Both conceptions, cultural modality and ego-identity, are taken up in J. Block's analysis, which forms a theoretical synthesis beginning with the conformist stage. Now, at this stage, the individual fulfils his or her role in society in conformity with the stereotypes for his or her respective sex. Girls are extremely feminine and boys masculine. This state continues until both sexes have realized that they are not capable of meeting, in all areas, the cultural expectations for their respective sex. Then, the conscientious stage is reached when girls and boys feel incommensurability of their personal preferences with cultural expectations. Attempts to cope with the conflicting demands of culture – yielding individuality victorious – characterize the autonomous stage. At this point, both girls and boys communicate their distinguishing sexual characteristics to society. Ultimately, it is possible to reach the integrated stage, a balance between male and female characteristics, which can be described in terms of androgyny. Some characteristics of one's own sex weaken while other characteristics (associated with the opposite sex) strengthen. For instance, women cease being dependent and become more independent, etc. In terms of social agency, the most mature and effective form, according to Block, is an integration of male and female characteristics (Block 1976, p.72).

Thus, in this study, the level of gender role development will be conceptualized as a four-fold variable: conformity, conscientiousness, autonomy, and integration (also known as androgyny).

The second variable is self-efficacy, understood here – as in the 2009 study – in terms of an individual's beliefs about his or her personal ability to meet various conditions to achieve intended results. Understood in this way, an individual's sense of self-efficacy, with regard to his or her pedagogical experience in the role of parent, allows us to estimate parents' beliefs as to their own potential to achieve recognized educational standards with regard to their own children. It should be added that Bandura treats the sense of self-efficacy as one of the factors of effective agency (Bussey, Bandura 1999, p.691).

On the basis of both these conceptualizations, studies were designed in which the dependent variable was the sense of efficacy, while the constant variable was the level of gender role development. We should keep in mind that the results, which indicate the essential difference between the means of self-efficacy due to

the level of gender role development, are an argument against the inappropriate rendering of gender as sex in the 2009 study. Yet, above all, they are an argument for avoiding “obvious” conceptualizations of gender in psychological and pedagogical research.

## **Method**

Quantitative strategy, the theoretical exploratory type, experimental schematic, data collection methods: situational and paper-pencil testing, random sample selection, data analysis: one-way ANOVA – these are the main methodological parameters of this study. How were variables measured? The sense of efficacy was measured with the use of situational testing: each participant was given three educational situations concerning his or her child along with difficult educational problems to solve. The conditions for the parents’ participation were set, and each parent was asked to judge the possibility of dealing with the problem in such a manner as to find an effective solution consistent with pedagogical standards. The average score (recorded on a scale of one to three) – the index of the participants’ sense of educational self-efficacy – was derived from the participants’ judgment of these three situations, which gives us the measurement of the interval scale, a prerequisite for the application of ANOVA as a method for analyzing data.

The second variable was measured with the help of The Gender Role Development Test (Test Rozwoju Roli Płciowej – TRRP) in the version for women and men, which was designed by M. Chomczyńska-Miliszkievicz, and based on J. Block’s theory. The test is fully standardized: the discriminating power of items ranges from 0.31 to 0.78 for the point-biserial correlation coefficient, reliability, according to the Spearman-Brown formula, is at 0.75, and theoretical accuracy, measured by Pearson’s product-moment correlation coefficient (along with the results from Kuczyńska’s Psychological Gender Inventory Test – Inwentarz Płci Psychologicznej (Kuczyńska 1992) – based on Bem’s theories (Bem 1985, pp.179–226)) is at 0.48. All the coefficients are statistically significant. The sten (Standard Ten) norms were also calculated, therefore the measurement is found to be on the interval scale (Chomczyńska-Miliszkievicz 2002, pp. 185–190).

30 participants (15 women and 15 men) presenting particular variants in gender role development were randomly selected from a random pool of 212 parents – half of them women, and half men. Both randomized trials were performed on a sample population from the Kujawsko-Pomorskie region.

## Results

The data obtained was subjected to one-way ANOVA on the basis of the homogeneity of variance (Levene's Statistic). Table 1 shows the averages and standard deviations for the sense of efficacy for each particular level of gender role development. The highest sense of efficacy occurred in the group at integrative-level (androgyny), followed by the conformity-level group. By far, the lowest occurred in the group at the conscientious-level, and subsequently in the group at the autonomous-level. ANOVA (Table 2) confirmed the statistical significance of these relationships. Eta square – effect size revealed, however, that the level of gender role development explained over 19% of the variation in the sense of efficacy.

**Table 1.** Means and standard deviations of self-efficacy for variances of the level of gender role development.

Dimension of Level gender role development	Mean	N	Std. Deviation
1.00 (the conformist)	2.1667	30	1.31525
2.00 (the conscientious)	1.1667	30	.37905
3.00 (the autonomous)	1.8667	30	.93710
4.00 (the integrated)	2.5000	30	1.19626
Total	1.9250	120	1.12394

Source: own research

**Table 2.** Anova results for self-efficacy and the level of gender role development

Sources of variance		Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)	29.025	3	9.675	9.252	.000
	Linearity	12.615	1	12.615	12.064	.001
	Deviation from Linearity	16.410	2	8.050	7.846	.001
Within Groups		121.300	116	1.046		
Total ETA SQ = 0,193		150.325	119			

Source: own research

This result shows that if we replace sex with the cultural idea of gender, then the variable takes an active part in explaining the parents' sense of pedagogical efficacy. The strongest sense of efficacy occurred in the group of participants who had

reached the androgynous level of gender development. This result coincides with the hypotheses that assert the high social functionality of androgyny. One might think that having a balance between male and female characteristics is conducive to solving pedagogical problems, because these problems may be considered to have both male and female nature. Educational activity is cultural activity due to its aims, but also due to its sources. And femininity and masculinity are – as Bakan put it – modalities of culture. This does not at all conflict with the thesis regarding the functionality of stereotypes, as both feminine and masculine characteristics encourage particular cultural effects, interpersonal as well as educational ones. However, the presence of these stereotypical traits in androgynous individuals modifies the thesis regarding the functionality of stereotypes to the following form: the relative functionality of stereotypes. One can claim that this conclusion indirectly follows from the data obtained by the conformist-level individuals in the performance of gender roles. The conformist-level parents have the second highest mean value, yet a value much lower than the average androgynous parent. A sense of efficacy is also built on the basis of an individual's previous experiences. Thus, it may be the case that the problems between conformist-level mothers and boys, or conformist-level fathers and girls, are caused by negative experiences, in effect lowering the average sense of educational efficacy. This, however, was not studied. On the other hand, the standard deviation of this sample group is somewhat lower than the androgynous group, and thus the average is slightly more uniform. "A little more" is an apt description, because the difference is quite small. Yet, in terms of value, androgynous parents are more strongly scattered than conformist parents when it comes to the sense of pedagogical efficacy.

The lowest average for the sense of efficacy was attained by the individuals who still experience difficulty in defining themselves in terms of androgyny, but who also no longer see themselves in terms of conformity in relation to gender roles. This is clearly a crisis phase, which is hardly conducive to building self-confidence, especially in a domain such as parenting, which is heavily burdened with responsibility for others. This low sense of efficacy can be considered quite dangerous for the children themselves, because it includes two out of the four stages of parents' gender role development, which can last quite a long time, and which do not at all have to be revealed in adolescence, and often appear in early, and even middle adulthood. It is a difficult matter to interpret, since we still do not know in fact how the crisis-phase functionality of adults influences the development of their children... seemingly negatively, if we assume that the sense of efficacy is an indicator or the basis for effective action. However, there is an insufficient amount of data to formulate such theses unequivocally.

Finally, referring to the problem discussed in these studies, one can assume that gender is a modifying factor in parents' sense of educational efficacy, whereas we cannot always say this about sex.

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## Personal Narratives of School Educators on Supporting the Development of Gifted Students

### Abstract

The article presents results of research conducted with the participation of professionally active school educators, working in primary and lower secondary schools in the province of Silesia. The research model assumes that development support concerns the following question about relationships: “who provides support?”, “who is supported?”, “what is the purpose of the support?”, “when?”, “how?” and “what is the result?” A “collective case study” qualitative method was employed in the form of the narrative interview. The research focused on educational experience of school educators in the process of supporting gifted students.

**Key words:** *development support, gifted student, narrative experience of school educators.*

### Introduction

Analyses results of psychological and educational determinants of the development of children and youth prove that support provided by educational institutions is related to the professional competences of those providing assistance (*i.e.* school tutors). Supporters should be trustworthy, highly empathic and responsible and have a positive attitude to students. In short, they require a high level of communication and social skills.

## **Methodological assumptions**

L.M. Brammer (1984) noted that effectiveness of development support is determined by trust and faith in the child's willingness and capabilities, and the tutor's self-trust and self-confidence confirmed in practice. In my research I adopted this assumption. Supportive conditions are created best if a person providing assistance is self-aware and aware of their own value system, is skilful in handling the emotional problems of others, has a satisfying private life (can serve as a role model, a master), is interested in people and changes in society, acts according to norms and ethical values that fit the situation and are accepted by society, is ready to take responsibility for their own behaviour and the behaviour of persons in their care (Brammer, 1984 as cited in: Porzak, 1994, p. 18).

Successful support depends on the specific conditions that arise from the competencies of supporters (Rogers, 1984) and the environment in which it takes place. The research model assumes that development support concerns the following question about relationships: "who provides support?", "who is supported?", "what is the purpose of the support?", "when?", "how?" and "what is the result?" (Kielar-Turska, 2003, pp. 20–21). Therefore, the following statement of the research problem was developed: *What is the experience of school tutors in the area of psychological and educational work with gifted students?*

## **Research methodology**

Open-ended, in-depth interviews concerning reflections and experience of psychological and educational support of gifted students in school were conducted with 33 professionally active tutors. The group consisted of 32 women and 1 man. The interviews were conducted in single, one-hour sessions at which the respondents were requested to share their personal experience and reflections on working with gifted students. At the interviews, the participants expressed their opinions as the researcher simply suggested specific narration areas in order to elaborate particular issues.

In the research I introduced a similar analysis to collective case study. This means interpretation not of individual pieces of information, but a collective or instrument case study as described by R.E. Stake. In this method a researcher conducts parallel research on several subjects in order to understand a particular phenomenon.

## **Research results**

Reconstruction of the interviews identified four problem areas (narrative passages) experienced by school tutors who work with gifted students. First, the narratives focused on assessment of actual activities undertaken at school, and on problems encountered while working with gifted students. Second, the respondents assessed cooperation with Psychological and Education Counselling Centres and third, collaboration with parents of gifted students. The fourth area concerned prospects and opportunities of improving psychological and education activities undertaken in school to support development of gifted students.

Analysis of the most common problems experienced in practice shows that most respondents believe the situation of gifted and particularly talented children is not the best. In their narratives the tutors often state that working with talented students in school takes place only on paper (in the records of school documentation), and sometimes at the meetings of special interest groups, although most of these are only compensatory activities for poor or average students.

Justyna – school tutor in a primary school, 9 years of work experience:

*...Until now, in the school where I work, there has been practically no work with gifted students. Short preparations for the school contest or local competitions are the only exceptions.*

Hanna – school tutor, primary school, 16 years of work experience:

*...Until now, schools have been oriented towards the average student's education; a gifted student was expected to manage on their own. I think that we are not prepared to approach each student individually, which is necessary in the case of gifted children. Teachers are focused on the implementation of the curriculum and do not have a chance to develop gifted children's subjects of interest. The reason is quite prosaic: a lack of time. Many teachers are of the opinion that the only thing they can do for such demanding children is to grant them excellent grades. It is an obvious misunderstanding.*

Agnieszka, primary school, 7 years of work experience:

*...Analysing both my work and the work of my colleagues I can definitely state that we usually devote much more time to children with difficulties. For them various activities are organized, individual plans of corrective and compensatory activities are developed, and gifted students have to manage on their own.*

Bogusia – school tutor, primary school, 18 years of work experience:

*... The attitude of many teachers and school tutors towards outstanding students, students with high intelligence and creative potential leaves much to be desired. Therefore, gifted students in most schools in Poland are invisible, not noticed, or even discriminated against. So far, no one has been interested in this issue since it is assumed that gifted people will develop their talents, regardless of environmental determinants and the extent to which their education needs are met. (...) Work with gifted students should become a distinct domain of the school, which so far has been oriented to general education and working with average students. In school, gifted children were either not noticed or neglected.*

Maja – school tutor, lower secondary school, 8 years of work experience:

*Special interest groups and extracurricular activities are the only offer for gifted students. In fact, most of these lessons boil down to doing homework or they are treated as compensatory classes and attended by the poorest students. So, in practice a gifted student does not receive anything. (...) Not all exceptionally gifted children can enhance their potential. School causes distress and creates development obstacles for them. Due to the fact that there is a lack of a proper attitude to them, they have to struggle to adapt. Frequently they are not able to have appropriate relations with their peers, which lowers their self-esteem. I know of only one teacher who allows students to develop their talents and makes them feel self-confident. In school, most of the teachers know too little about gifted students and how to help them.*

The narrations presented above paint an honest and true picture of school life, seen through the eyes of its participants. As seen in the quotations, school is a good place for an average student, who meets curriculum requirements easily. If there are any additional activities aimed at development support, they are focused on poor students and the ones who have difficulties meeting their obligations.

Some respondents critically assess psychological and education activities oriented at gifted students. They openly and directly admit that they do nothing or very little in this area. It is quite disturbing that educational work with gifted children is discussed relatively rarely. If it is a subject of discussion at all, it is mentioned at the meetings of problem-solving teams, at which “participants are mainly focused on difficult students or possibly (sic!) on gifted children”.

Maja – school tutor, lower secondary school, 8 years of work experience:

*...In school, psychological and educational activities do not practically exist. In most cases, it's mainly about organizing special interest groups, school sport clubs and involving gifted children in contests, while there are not any psychological or educational activities directed to such students. Sadly, it looks like this in most schools I know.*

Marcelina – school tutor in a lower secondary school, 11 years of work experience:

*...As far as gifted students are concerned, I have to say honestly that too little energy is devoted to this group. The greatest attention is given to children suffering from disorders and students with specific learning difficulties. In fact, working with gifted children boils down to development of their talents in special interest groups.*

Magdalena – school tutor, primary school, 24 years of work experience:

*...Unfortunately, in our school, gifted children never make use of psychological and educational support as, in fact, it is reserved primarily for students with behaviour and learning issues.*

The uncomfortable position of gifted students in school, visible in the narratives analysed, results from making distracting demands and “using” academically gifted children in many areas by teachers of various subjects. A gifted student is usually involved in the largest possible number of contests, which do not necessarily directly relate to their interests and abilities. Teachers exploit gifted students not taking their real needs into account:

*In our school these poor children attend all meetings of special interest groups, because this is how their teachers want to show off. In most cases, they've got enough of it, they're exhausted and don't feel sufficiently strong to do anything”; “at present, teachers are expected to organize additional activities and therefore they make gifted students do everything, ignoring their needs completely. It's sad.*

In the opinion of the studied tutors, an incorrect procedure of awarding scholarships to gifted children, financed by local government units, is one of the biggest problems.

*Scholarships granted by the city hall are addressed to gifted students, but on condition that their grade point average is high. Therefore, in fact, it is not their real talents that*

*are rewarded. Sometimes – absurdly – at the teachers' meeting, pressure is exerted upon a teacher to give a higher mark to a student who is excellent at maths but whose biology is shaky. If a student did not get a higher mark, his grade average would not be sufficient to receive a scholarship and our school boasts of such students.*

In their narratives, many school tutors express their negative opinions about teachers, their competencies, activities and ability to work with gifted students. The respondents willingly and on their own initiative provided numerous examples of inappropriate behaviours or attitudes towards gifted students.

Aleksandra – has worked as a school tutor for 12 years, primary school:

*Being a gifted student you have to be very lucky to meet wise, involved teachers who will help and support you.*

Joanna – school tutor in lower secondary school, 13 years of work experience:

*...Due to haste, highly gifted students are lost somewhere in the sea of unexceptional students. Very often teachers do not notice such students, yet society is still waiting for them. It is awaiting new discoveries, technological development, and achievements in many areas. However, in schools all attention is paid to students with difficulties, disorders, diseases and adjustment problems. As a result, gifted children are left on their own.*

Marta – has worked as a school tutor for 15 years, primary school:

*...The need for appropriate care and education of highly gifted students is often ignored and passed over in silence. It results from the fact that, like children with learning difficulties, gifted students also require additional work. They can be perceived as difficult students who require individual work conditions. Unfortunately, there is no hope for that in today's school. The easiest approach for the teachers is to normalize tasks and adjust them to the level of average students. Furthermore, there are many more students with learning difficulties than gifted students and that is why it is more important for the teachers to focus on them, since better pupils will manage on their own anyway. It quite frequently happens that gifted students are partially ignored in class, since they do not have problems with learning or behaviour. By such omission we have wasted many talents on the way. You could honestly say that we just ignored these children's needs.*

Małgorzata – 13 years of experience as a school tutor in a primary school:

*... Unfortunately, as far as my experience is concerned, despite many lofty goals and objectives, the position of a gifted student is not easy in the contemporary school. I know from my talks with teachers that they had to unify their work to have all the students subject to more or less the same activities so that they acquire specific knowledge and skills. In such a situation gifted students have no opportunity to use their intellectual potential and, in consequence, cannot develop their capabilities.*

On the basis of authentic examples and experience of the respondents, one may conclude that involvement of teachers in work with gifted students deserves a negative assessment. In the narratives quoted above allegations against teachers are quite explicit. They concern lack of motivation to work with gifted students, reluctance to engage, undertake additional activities or involve themselves in work with this group of pupils. They also show that teachers lack knowledge of psychological principles relating to teaching gifted students as well as of managing their work effectively and motivating them to learn.

Małgorzata – 13 years in service, school tutor in a primary school:

*... Teachers praise gifted students too rarely, and too often criticise them for underachievement, as in their opinion criticism is a better motivation to act. However, it's wrong. It's the school's responsibility to build students' self-esteem by noticing their achievements and sharing their successes. Gifted students are often exploited – a teacher does not take their harmonized – mental, emotional and social – development into account, but wants to transfer as much information as possible. Such activities are directed only at increasing students' chances to win contests and do not lead to satisfaction of their psychological needs.*

Irena – school tutor in a primary school, 11 years of work experience:

*... I can remember one negative experience in which gifted students were involved. In one form, there were three gifted girls – very active from the very beginning. They participated in many contests and won all of them. After some time, when the three of them wanted to participate in the next contest on the knowledge of the Polish language, to their surprise, their teacher decided that they couldn't participate as it was necessary to activate other students. By the way, she had to select "volunteers" herself as nobody wanted to participate. As might have been expected, they did not succeed. However, the gifted girls were very discouraged and they would not participate in contests any more. I have to admit that they lost motivation to develop their interests. It's very sad that teachers make such significant education errors.*

Katarzyna – school tutor, 9 years of work experience, primary school: *“at school there is nothing but pure functionalism. We need mathematicians for a contest and we don’t have them, so we put pressure on our students. However, we can’t talk about any real individualisation – we do not check the actual potential of a child, we don’t ask “what is it about this child?” In fact we do not make any diagnosis. Generally, for teachers it’s all the same. If you ask them whether they have any gifted students in class – they can’t name them”.*

In their narratives, the school tutors mentioned several positive examples of their activities with gifted students. These were focused on making applications to Psychological and Education Counselling Centres. If a student is diagnosed with above-average capabilities, the centres usually recommend an individual learning programme. Apart from a teacher of a given subject, in addition a school tutor, a psychologist and a methodology counsellor may also be involved in such a programme. Some of the school tutors declared that this is the form of work with gifted students that they are involved in.

Agnieszka – school tutor in a primary school, 7 years of service: *“...I supervise implementation of an individual curriculum for two gifted students who are subject to such a programme after their diagnosis issued by the Psychological and Education Counselling Centre. My job is to organize meetings with the students and conduct interviews during which we discuss various emerging problems or difficulties”.*

Elżbieta – school tutor in lower secondary school, 12 years of work experience: *“... Sometimes gifted students who have temporary difficulties, for example in the implementation of an individual curriculum, are directed to the school tutor by a teacher or parent. If they are open to cooperation they have a chance to learn how to deal with failure. Then, we have an opportunity to talk about subjects from the area of emotional intelligence”.*

Many school tutors mentioned numerous psychological problems faced by gifted students as a difficult part of working with them. The tutors claim that gifted students are frequently involved in various conflicts within their peer group. Sometimes they do not reveal their capabilities on purpose, as they are afraid that they will not be accepted in a class. What is really striking here is that in such situations the school does not implement any educational activities. Most of the respondents claim that if a gifted student needs support then it usually results in stigmatization – s/he becomes a “difficult” student. What is even worse, the

respondents did not provide any precise information on activities undertaken in such cases.

Anna – 9 years of service as a school tutor in lower secondary school: “... *Many students feel isolated from their peers and rejected for being a top student, while acceptance of a group is a need of all students. A school tutor along with the form supervisor should make all efforts to make the life of gifted students in a school community easier. In practice, we do almost nothing in this respect. We only talk to the students. In my opinion, it’s sad.*”

Elżbieta – school tutor in a lower secondary school, 12 years of work experience: “... *Gifted students need support as they often feel lost. It happens that they are specialists in one area, but as far as their relations with peers and handling emotions are concerned, they are immature children. Sometimes they are rebellious and stressed since their parents demand a lot from them and constantly raise standards. There are as many individuals as students.*”

Aurelia – 14 years of service as a school tutor in a primary school: “...*Sometimes gifted children end up in my office because they need support in stressful situations and have problems with interpersonal relations. I’ve an impression that sometimes they face a dilemma: if they disclose their special talents they might get a label of a nerd. The peer group has a great impact on them. Sometimes to be accepted they choose not to be too active in class. What do I do then? I talk to them.*”

Joanna – school tutor in a lower secondary school, 13 years of work experience: “...*In most cases highly gifted children are rejected and isolated by their peers. However, it does not mean that they do not have a need to belong to a group. Identification with a group is crucial for them even though they behave as if they wanted to isolate themselves. Peers often hold it against them, saying that they act in a superior manner, are conceited, egoistic and not tolerant for the poorer ones. Such peer comments – more sensitive or less so – must have an impact on their emotional and social development. Sometimes they inhibit the development of their own interests.*”

In the above-quoted narratives of school tutors it is shocking and alarming that in the case of specific emotional and social problems of gifted and talented students, teachers are helpless and do not have any pedagogical measures they could implement in such a situation. Out of 33 respondents only one school tutor had a positive opinion about activities undertaken in her school in relation to gifted students.

The process of identifying gifted students is yet another problem specified by school tutors in their narratives. Stereotypically, many teachers think about gifted

students only in terms of good school performance, extracurricular knowledge and intellectual abilities. Teachers and school tutors have their own theories about gifted students, which in practice results in the exclusion a large number of students with potential abilities or talents from this category. Gifted children are primarily seen through the prism of logical thinking ability, as well as extracurricular knowledge and skills. In a subjective diagnosis of a gifted student various aspects of abilities and talents are completely ignored. In fact, children's special capabilities are seen only as tangible achievements, but also as their potential which could be disclosed in favourable conditions. Unfortunately, the school environment does not guarantee such conditions and therefore outstanding potential of many students cannot be discovered.

Karolina – school tutor, lower secondary school, 7 years of work experience:

*...In fact, in school we do not use any methods, tests or any other means which could reliably and unambiguously identify children's abilities. We do not conduct a wide-ranging diagnosis. We base judgements only on our experience which, in my opinion, is the main reason for not indentifying gifted students.*

Aneta – school tutor, primary school, 8 years of work experience:

*...I think that, generally, identification of gifted students is a problem area. Based on my observations I must admit that each teacher defines a gifted student differently. For example, for one educator, a child with any kind of interest is a gifted student, for another one this definition includes the best learning achievements, while for another one a gifted student must have outstanding creative talent.*

Małgorzata – 13 years of service as a school tutor in a primary school:

*...Gifted students lack teachers' favourable attitude towards them. We still deal with a stereotype, according to which a gifted child must be obedient, diligent, adjusting to the school's requirements without a word of complaint, not creating any learning or behavioural problems. Thus, it means that a gifted student only has good learning results, does not ask difficult questions and does not have strange ideas.*

Ewelina – school tutor in a lower secondary school, 18 years of work experience:

*...Teachers have no knowledge whatsoever about the characteristics of a gifted student. For most of them, only students with excellent learning results can belong to this cat-*

*egory. They completely ignore unconventional, creative students who have uncommon interests and original ideas.*

At the same time, some of the respondents talked about the need for a reliable system of identifying students' abilities and aptitudes. The narratives indicate that even school tutors, in their assessments of a gifted student, base it on the opinion of the teacher, who taught a student in the integrated education during the first years of school. The analysis also demonstrates the need for professional development of the respondents in the scope of diagnosing students' abilities and aptitudes.

Elżbieta – school tutor in a lower secondary school, 12 years of work experience:

*... We have a lot to do in the case of gifted students. We should undertake concrete, well-planned activities, and introduce a system of support and assistance. This should be based on a reliable diagnosis in the first years of learning, so we could identify school talent at the very beginning.*

The next problem area, identified by the analysis of the narratives, is cooperation between a school tutor and Psychological and Education Counselling Centres, assessed by the respondents. They were not very open about this issue and in most cases they just expressed their negative opinion in a few words about collaboration of a school and a centre. The comments of the tutor with the longest service (22 years) and another one who has worked at school for 8 years provide good examples:

Ewa – school tutor, primary school, 22 years of work experience:

*...In practice, our cooperation with a Psychological and Education Counselling Centre is focused exclusively on students with various problems while gifted pupils are totally ignored.*

Maja – school tutor, lower secondary school, 8 years of work experience:

*Cooperation with a Psychological and Education Counselling Centre is limited to sending a student to do tests there. A diagnosed student is offered additional lessons with a selected teacher and can work according to an individualized syllabus. However, it is a very rare situation.*

The quotations show that in practice school tutors do not cooperate with the centre in supporting gifted students. All activities in this field are limited to receiving a diagnosis of the student's abilities and aptitude.

The next problem area, identified by the analysis of the narratives, is cooperation between school and parents. Unfortunately, most of the remarks are negative or are just wishful thinking. In fact, cooperation between a school tutor and the student's family environment is rather incidental. School tutors claim that parents do not show any interest in supporting their children's abilities. This problem appears in families of lower economic status and environments at risk of marginalization.

Beata – school tutor in a primary school, 18 years of work experience:

*... In practice, we do not cooperate with parents of gifted students at all. I do not really recall even one such situation. Most of my students have behavioural or learning difficulties”.*

Jolanta – 4 years of service as a school tutor, primary school:

*I'd like to cooperate with the parents more actively, but it's wishful thinking, I'm afraid. They know most about the child and can make a difference.*

Based on their experience, the respondents provide negative examples of attempts to start cooperation with parents. As they claim, in most cases parents shift the responsibility onto the school and do not understand the problem. Thus, we deal here with a conflict between school and family.

Patrycja – 8 years of service as a school tutor in a primary school:

*I remember one gifted student who was lazy, stubborn and despite his extraordinary abilities would not participate in any contests. Even talking to his parents did not change anything, as they were not interested in what was going on in school; they had no time for it.*

Hanna – school tutor, primary school, 16 years of service:

*... My discussions with parents showed a fairly depressing picture. Most of them are of the opinion that the intellectual potential of their children is very frequently wasted. Parents think that even when the school introduced some kind of a programme of gifted children support, it functions only on paper. I talked to parents who had filled in questionnaires concerning their children's abilities at the beginning of the school year. They expected concrete proposals and interesting offers for their educationally promising children. Unfortunately, time passed and nothing but participation in various contests (however, without additional help of the teachers) was offered to them. In such circum-*

*stances, students whose parents support their learning, achievements and development outside school should be considered lucky. It's sad, but true.*

## **Summary**

In their narratives many tutors mentioned that *in school it's only said..., assumed..., decided..., but I see it totally different*. The respondents provided many examples of inappropriate or wrong communication between teachers and gifted students, inefficient organization of the teaching and educational process and lack of coordinated support (parents, teachers, school tutor and student) for student abilities and aptitudes. Analysis of individual narratives and the fact that there are no (or only a few) records, made it possible to conclude that cooperation between the school and family of a gifted student is also unsatisfactory. The respondents' narratives confirm such irregularities and, in fact, a kind of school helplessness, since there are no efficient ways to encourage the student's parents to cooperate. Based on the analysis of the narratives, especially those dedicated to the enhancement of cooperation between school and gifted students, it is impossible not to notice caution and fears related to the introduction of new regulations and new solutions in the area of work with gifted students. The new provisions came into force on 1 September 2011 in lower secondary schools and, at a later time, they will be binding for primary schools. Even though the tutors can see many ways to improve this area of school activity, they are afraid to undertake additional effort in the face of resistance and frequent unwillingness to change well-known methods. Many of them have negative experience from the past, which makes them cautious about the planned changes.

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## **Policy – Driven Professionalism in the Education Workforce: England 2004–2010**

### **Abstract**

In England over the period 2004–2010 there was significant change in the education and training for those working with children and young people to meet policy objectives. This article aims to briefly outline some of the impacts for ‘associate professionals’ who were working in educational settings during this period, and to discuss how these changes may influence their professional status in the longer term. In addition, the article seeks to draw attention to the ways in which policy can reinforce or undermine workforce professionalism, and the variable resources that professions may have to manage these processes. The intention is to provide an insight into processes in one European country that may be of interest to other countries where reform to the organisation of care and education for children may be in development, for example through the development of pre-school infrastructure to meet policy and labour market objectives (i.e. ‘Program MALUCH’ in Poland), as outlined by the Polish Ministerstwo Pracy i Polityki Społecznej (2011).

*Key words: professionalism, education policy, workforce development.*

### **Introduction: Policy, professionalism and workforce remodelling**

There was substantial policy driven intervention which aimed to reshape the practice of those working with children and young people over the period 2004–2010 in England, with key policy set out in the Children’s Workforce Strategy (HM Government 2005a) as part of the Every Child Matters agenda, which aimed

to drive ‘radical change in the whole system of children’s services’ (HM Government 2004). This can be seen as primarily a consequence of new educational and social care policies that aimed to transform the environment in which children grow up through investment in schools and early years settings and remodel the workforce with the introduction of new ‘associate professionals’ or ‘semi-professionals’ (Edmond and Price 2007) working alongside, or in connection with, more established professions, including teaching and social work. Government policy was therefore a key factor influencing professional standards for those working with children and young people in this period, in an externally-driven pattern that contrasts with modes of organisation in the more autonomous ‘traditional’ professions, who have greater discretion over their professional standards (Evetts 2005). Indeed, many of the more established roles that were affected by this policy agenda have themselves been ‘professionalised’ as part of the growth of the welfare state, for example in the case of school teaching (Tomlinson 2001). The ambitious policy agenda of the New Labour era changed the profile of the workforce, particularly in early years provision (up to school age) and in schools themselves, with new or remodelled roles such as Learning Mentors, Parent Support Advisers, Behaviour Support Workers and Teaching Assistants in schools and a range of early years workers, including Early Years Professionals, who were encouraged to work towards Early Years Professional Status (EYPS). In schools, the introduction of these roles has impacted on teachers’ traditional pastoral responsibilities and led to Teaching Assistants assuming ever greater pedagogical responsibilities (Edmond and Price 2007), with potential impacts on overall achievement for children (Blatchford et al. 2004, 2009), although there may well have been substantial benefits for teaching staff and individual students.

### **The impact of policy on educational provision for practitioners**

The extent of policy reform and barrage of policy initiatives led to many existing staff experiencing greater structure to their learning opportunities. Those interested in or currently working with children and young people were encouraged to enrol on 2 year Foundation Degrees and competence based qualifications for those in work (National Vocational Qualifications), and an expansion in accreditation resulted in Foundation Degrees in ‘Education’ becoming the most numerous of all subjects (Edmond et. al. 2007), taken up primarily by a chiefly female student body already in employment in schools or in settings for pre-school children (Harvey 2009). Many of these Foundation Degrees , which often lead on to a ‘top-up’

year for a full Bachelor's degree, rely substantially on 'in-service' learning in the workplace, and although a considerable improvement on the situation for staff before 1997, still raise concerns about the development of a robust professional approach (Edmond et. al. 2007) at an extended 'higher' level, with some claiming that Foundation Degrees share more in common with Further Education than Higher Education (Ainley 2004).

Providers of Higher Education clearly responded to the specifications set by government and government sponsored agencies in terms of adapting existing degree level programmes, or developing new ones, to meet the policy challenge, as can be evidenced by the speedy transition towards Foundation Degrees in this area (Harvey 2009). The 150 'top tier' Local authorities in England, in response to new policy introduced by the government, were charged with the development of their local workforces through in-service education and training (HM Government 2005a), and are also recruiters of any of those who have undertaken pre-service education and training. This led to a range of different approaches to workforce development across local authorities, and different implementation outcomes reflecting the specific circumstances of services for children and young people in local areas. Some partnerships between higher education institutions and local authorities have also emerged to meet new local demand resulting from government policy (Harvey2009). A key factor influencing the content and structure of Foundation Degrees has been the growth of sector endorsement through the Early Years Sector Endorsed Foundation Degree initiative, which began in 2002 and provided a nationally-recognised framework within which higher education institutions could design programmes (Knight et. al. 2006) and prepare students for Early Years Professional Status (EYPS). Over 300 Foundation Degrees became available in Education (Edmond et al. 2007) and there were 4915 entrants to Foundation Degrees in Education in 2005–06 across all higher education institutions and further education colleges, accounting for 18% of all Foundation Degrees (HEFCE 2008). 2290 of these entrants were on programmes with titles related to early years and early childhood studies and 1220 on programmes relating to teaching support. There were also 1485 entrants to 'Social Work' programmes, many of which related closely to employment in children and young people's services, with about 40% developing youth work practitioners (HEFCE 2008). In policy terms, the mass enrolment on part time courses of employed staff in roles that were previously only loosely related to any 'licence to practice' can be seen as having been a useful means of making progress towards the previous government's policy objective of 40% of adults qualified to higher education level by 2020, as recommended by the Leitch Review of Skills (HM Treasury 2006).

## **Knowledge, values and identity for the associate professions**

The bodies of knowledge that form the basis for these new ‘associate professional’ identities could be seen as closely intertwined with welfarist and social democratic ideologies and the particular policy context developed by the New Labour government over this period. Professional formation also incorporated the requirement on new staff to adopt values that are seen as necessarily concomitant with becoming a member of the children and young people’s workforce. This promotion of appropriate values, as expressed in the Common Core of Skills and Knowledge for the Children’s Workforce (HM Government 2005b) and embodied in the Common Induction Standards for the Children and Young People’s workforce (CWDC 2007), can be seen as a cornerstone of the policy objective of embedding a professional identity. However, the standards could be seen as both externally imposed and superficial if not subject to ongoing critical reflection as part of in-service professional development, with rigorous processes of analysis and challenge to provide practitioners with confidence to make value-based decisions, often in complex and emotionally-charged scenarios.

Whatever the validity and appropriacy of the value system, any uncritical adoption of values and behaviours is problematic as may not result in the level of individual development and critically aware professionalism necessary to perform effectively. The creation of ‘pedagogical teams’ or ‘teams around the child’, was intended to bring together professionals sharing these child-centred values, but if this is imposed through policy, rather than allowed to develop through the development of a professional body of knowledge owned by practitioners there may be risks to the integrity and function of the teams, in addition to the potential for conflict with other professional value systems. Furthermore, if the government-sponsored value system is undermined by new policies that emphasise different priorities, the result would be detrimental to professionalism, just as a lack of control over the character of professional formation weakens professional identity and influence (Friedson 2001).

When responsibilities are allocated, or dispersed, across a range of workers, professional identities and relationships change. Political parties in the U.K. often speak of creating circumstances in schools where teachers are unburdened of bureaucracy so that they can concentrate on teaching (i.e. DfES 2004), but the role specified for teachers also appears to have taken on technocratic aspects that contrast with traditional notions of teacher professionalism (Patrick et al. 2003, Furlong et al. 2000), particularly as teacher status itself has increasingly been separated from its roots in traditional classroom-based initial teacher education

and acquired some aspects of competence-based approaches, for example in school centred training (Furlong et al. 2000). Indeed, school-centred training is likely to substantially increase under the new coalition government in the U.K. (SCETT 2011), so this pattern of moving teacher education out of higher education institutions may continue.

### **The sustainability of the associate professions**

Although degree level qualifications may increasingly have been achieved by large numbers of those working with children and young people during 2004–10, and by new entrants as part of initial formation, there may be a risk that the professional groups are not self-sustaining or in possession of control over a body of knowledge or sufficient autonomy to the degree necessary to be considered viable as a profession (Friedson 2001). The educational processes associated with the acquisition of these skills may exhibit more of the characteristics of ‘trainability’ (Bernstein 2000:59) than the criticality that may serve the development of greater professional demarcation and autonomy. Both the teaching and social work professions have been subject to these criticisms in the past, primarily because they are engaged in work on the basis of knowledge assumptions that are subject to political interference, shaking the foundations of the profession and leaving staff, service users and the public less confident in the latest teaching methodology or social work intervention (Bangs et al. 2010).

It is conceivable that new developments in policy, changes in government, or new knowledge or practice paradigms, result in the failure of some of the new associate professions as a consequence of a new phase of ‘workforce re-modelling’. This may occur as a consequence of the policies of the new UK coalition government from 2010 onwards, weakening the position of many of those who have committed themselves to developing their skills in working with children and young people. Just as teachers and social workers have struggled to resist changes made to their roles and responsibilities, new professional groups may struggle. Without a widely accepted claim to expertise, a practice tradition or body of knowledge, it is possible that some of the associate professions will become redundant, lacking the means to engage in the debate with more powerful groups. It is questionable whether sufficiently strong identification with the roles is sufficient to ensure longer term continuation in their current forms. A further possibility is the transfer of staff into new roles formed by new policies and strategies which may be based on the ideological assumptions of new political forces or changing social norms. The

associate professionals, unable to influence the policy evolution are thereby liable to be compelled to adjust or replaced by new cadres, with significant consequences for the value of any educational provision they have engaged in and the skills they have developed. Many of these skills and competencies may be applicable in new working contexts, but the risk of this not happening is far greater than for other older professions such as teachers and social workers, let alone lawyers and doctors. We might suggest therefore that the skills prioritised for the children and young people's workforce over the last 15 years could become dependent for their longer term validation on the specifics of the policy context.

There is a risk of immaturity of career structure within each of the associate professions, meaning that individuals may need to take further initial formation competency-based qualifications to progress to related higher level occupations in the sector, for example between Teaching Assistant and Teacher without full acknowledgement of prior qualifications and experience. Similarly, transferability between the associate professions and progression paths within the sector are underdeveloped (Edmond and Price 2007). Any significant requirements to re-train at the same level undermine claims that staff have undergone longer term skill formation that has longer term value. Such a scenario would indicate that the substantial growth in degree level programmes for the children and young people's workforce primarily met the objectives of policy rather than individual learners or perhaps the children, young people and families with whom new associate professionals were asked to work. Although there have been attempts to devise a 'common core of skills and knowledge' for the children and young people's workforce (HM Government 2005b) to support integrated working between the various associate professionals as a means of constituting an accepted body of knowledge and practice which the 'team around the child' could adhere to if not own, this attempt at integration may already be substantially put at risk by the policies of the new coalition government.

## **Concluding remarks**

Overall, the pace of change and the lack of time available for professional identities to form and develop a body of independent valuable knowledge could put good practice at risk in contexts that are dense with complex human relationships and have considerable influence on child development. The example outlined above involved the delivery of an ambitious programme of investment in workforce development that will continue to influence practice in early years education and

schools in England for some time to come. The desire to achieve policy objectives through the creation of new groups of ‘professionalised’ workers using values that are policy-driven rather than organically developed, may have significant consequences for the durability of these emergent professional identities, which may be forcibly reshaped as new policy agendas emerge. Policy-driven professionalism by governments impatient for change may therefore undermine both the longer term professionalism of the workforce and the achievement of policy, particularly if staff feel unable to act as autonomous professionals with the confidence to take responsibility for vital decisions.

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## **Strangers When We Meet: A Case Study of Malaysian Students' Perceptions of Their International Peers**

### **Abstract**

Internationalization of higher education is becoming an important topic for studies in educational research. For the most part, these studies have been done in the context of economically developed countries that are traditional exporters of higher education. The present study is different. First of all, it was conducted in a public university in Malaysia, a developing country and a net importer of higher education. Secondly, it focused on the attitudes of the host country students towards their international peers, which has been a less explored area in educational research. The findings of this exploratory study revealed that despite an overwhelmingly positive attitude towards the international students expressed by the respondents, social and academic-related interactions between the local and foreign students were almost non-existent. The study gives some recommendations for institutional policy improvement and highlights some directions for future research.

*Key words: higher education, internationalization, Malaysia, peer perceptions.*

### **1. Introduction**

Internationalization of higher education, or cross-border education, has been a hot topic among educational researchers in the past decade. Internationalization can be defined as “the growing border-crossing activities between national systems of higher education” (Teichler, 2004, p. 5). Internationalization of higher education,

which involves “physical mobility, academic cooperation and academic knowledge transfer as well as international education” (Teichler, 2004, p.7), has been linked to globalization, the concept of the borderless world and the free movement of people, services and goods. Researchers realize that cross-border education is a complex multifaceted phenomenon that involves academic, social, and cultural aspects and brings many challenges (Kondakci, Van den Broeck and Yildirim, 2008).

Countries that have been importers of transnational education, such as Malaysia, are increasingly striving towards becoming major regional higher education hubs (Lee and Healy, 2006). For several decades, since the country’s independence from Britain in 1957, Malaysia has participated in cross-border education as a sending nation. The demand for higher education could not be satisfied domestically due to a limited number of institutions of higher learning and the absence of private providers of higher education until the early 1990s. In order to produce the local cadre for the government and industry, many indigenous Malays received scholarships to study abroad, mostly in English-speaking countries, such as Australia, the United Kingdom, and the United States.

In recent years, while remaining a net importer of higher education, Malaysia has been aiming to change its status in cross-border education regime and become a major provider of education in the region. One of the important targets has been to attract foreign undergraduate and graduate students to study in Malaysia. The primary markets for cross-country education in Malaysia have been China and South-East Asian countries (Morshidi, 2006). However, more recently, Malaysia has embarked on a quest to attract students from various parts of the world, including Turkey, European countries and the Middle East. One may argue that partially this drive is stimulated by the need to improve international rankings of the domestic Institutions of Higher Learning, which is a recent phenomenon in the international higher education. University rankings by the Times Higher Education (THE), formerly known as the THES-QS World University Ranking, are avidly watched and discussed by Malaysian policymakers, educationalists, and the relevant stakeholders. Among the various requirements that universities have to fulfill in order to achieve a higher ranking is the number of international students studying in their campuses.

Besides helping to enhance the international standing of the local providers of higher education, the benefits that international students bring to their host countries and institutions are manifold. They include a richer cultural diversity in the campuses, an opportunity for local students to be exposed to various opinions, outlooks and worldviews through communicating with their international peers; international students also add to the intellectual capital of their host countries

(Bevis, 2002; Lee and Rice, 2007). In the case of Malaysia, attracting international students and academic staff has a potential to mitigate the brain drain that the country currently experiences.

In recent years there has been a shift in educational research from macro-level analyses of various issues pertaining to internationalization of higher education to micro-level analyses exploring the experiences of the “real owners” of the process, such as domestic and international students, academics and administrators (Kondakci, Van den Broeck and Yildirim, 2008, p.449). It has been recognized that as far as international students are concerned there are many benefits and challenges in studying abroad. Among the former are the opportunities to enhance one’s cross-cultural knowledge, language skills and employability, to meet new people and make new friends (Sherry, Thomas and Chui, 2010; Sovic, 2009; Ünver, 2007). The latter include the difficulties in adjusting to a totally new environment. Many problems arise due to a lack of knowledge of the language and social norms of the host country’s community, inability to fit in the campus life and the limited opportunities to interact with the local community (Lee and Rice, 2007; Sherry, Thomas and Chui, 2010; Zhao et al., 2008). Research has indicated that a considerable part of successful integration into a community depends on the understanding, attitude and good will of the local hosts. Support from the local community, social interaction and a welcoming atmosphere on the campus are very important factors for international students’ academic success, emotional and mental wellbeing, and for overall satisfaction with their sojourn (Sam, 2001; Sümer, Poyrzli and Grahame, 2008; Tidwell and Hanassab, 2007).

Many of the previous studies have focused on the experiences of international students in the economically developed countries which have been traditional exporters of higher education, such as the United Kingdom, Australia, and the United States (Lee and Rice, 2007; Rosenthal, Russell and Thomson, 2007; Sherry, Thomas and Chui, 2010; Sovic, 2009; Yan and Berliner, 2011). Some studies have been conducted in relatively new destinations for foreign students, such as Spain (Cubillo, Sánchez and Cerviño, 2006) or Belgium (Kondakci, Van den Broeck and Yildirim, 2008). The present study is different from the previous research literature in two ways. Firstly, it was conducted in an institution of higher learning in Malaysia, which is a developing country and a net importer of cross-border education from developed countries (Lee and Healy, 2006). Secondly, it focused on the perceptions and attitudes of host country students towards their international peers. The study raised the following research questions:

1. What perceptions do the domestic students have about their international peers?

2. How robust are social and academic-related interactions between the domestic and international students?

Malaysia is a multi-cultural and multi-ethnic country in South-East Asia. It has been actively pursuing the target of becoming a net exporter of cross-border education. The University of Malaysia Sabah (UMS), where this study was conducted, is a big public university with more than 13,000 undergraduate students. It has over 300 international students who come from China, Indonesia, Brunei, Turkey, and the Middle East.

## **2. Method**

### **2.1. Research Instrument**

The research instrument was adopted with some modifications from a study by Spencer-Rodgers (2001). It contains one open-ended question (Question 1), five questions with Lykert-type scales for the answers (Questions 2–5), one closed question (Question 6), and a thermometer-type scale to measure the overall favourability towards international students. The participants were asked to supply some details regarding their demographic profile, such as age, gender, ethnic group, year of study at the university, school, and academic program. A short statement about the purpose of the research, which was to collect the students' perceptions of the international students in UMS, was included in the questionnaire.

The open-ended question (Question 1) sought to garner the host students' perception of their foreign peers; the participants were asked to write a few characteristics or qualities that they thought were typical of the international students in UMS as a group. Questions 2–4 focused on the frequency of social and academic interaction between the domestics and the international students. For instance, one question was "How often do you do things socially with international students? This includes eating together, going to movies, etc." The responses were marked on a 5-point Lykert-type scale ranging from "(1) never" to "(5) every day". Question 5 asked the respondents how many of their friends were international students; the answers were marked on a 5-point scale from "(1) none" to "(5) more than 10 persons". Responses to Question 6 ("Are there international students in your program?") were limited to "yes" or "no" answers. Finally, the students marked their overall favourability towards their international peers on the scale ranging from "0 — extremely negative" to "100 — extremely positive".

## 2.2. Data Collection and Analysis

A convenience sampling technique was employed. Thirty (30) photocopied forms were distributed to the students on the campus premises. All the forms (n=30) were returned to the researchers; however, three questionnaires had to be disqualified because the respondents were not undergraduate students (two respondents were off-campus students, and one respondent was pursuing a Master's degree).

The data obtained from the responses to Question 1 were analyzed through a qualitative approach (Cohen, Manion, and Morrison, 2007). At first, all the answers were listed verbatim and then they were separated into three categories. Overtly positive or overtly negative opinions were placed into the "positive" or the "negative" categories, respectively. The opinions which were not unambiguously positive or clearly negative, such as "(they are) rich", "(they) look different", "(they) have different culture" were placed into the "neutral" category. After this, the frequency of each answer was calculated; semantically close items (e.g., "polite" and "has good manners", "good" and "nice", "friendly" and "communicative") were grouped together.

A simple statistical analysis was used to analyze the students' answers to Questions 2–7. The data were first computed into the spreadsheet and then analyzed using the SPSS version 16 software.

## 3. Findings

### 3.1. The Participants

Data on the demographic profiles obtained from the questionnaires revealed that there were 16 male (59.3%) and 11 female (40.7%) students among the respondents. The students were between 20 and 28 years of age, and came from various ethnic groups living in Malaysia, including Malay (n=10, 37%), Chinese (n=5, 18.5%), Kadazan-Dusun (n=2, 7.4%), Bajau (n=2, 7.4%), Indian (n=1, 3.7%), and others (n=7, 25.9%). By the year of study, there were six ( 22.2%) first-year students, 12 ( 44.4%) second-year students, eight ( 29.6%) third-year students, and four ( 3.7%) fourth-year students. They were majoring in various academic disciplines, such as economics, finance, engineering, psychology, agriculture, and education.

### 3.2. Qualitative Analysis: Domestic Students' Opinions about their International Peers

The respondents provided 88 items to describe their international peers. The shortest list contained one item only, while the longest one consisted of six such descriptions. All the items are reported in Table 1.

**Table 1.** Attributes of International Students Studying in UMS

International students' attributes	Number of times mentioned	Percent
<i>Positive attributes (n=67, or 76.1 %)</i>		
Friendly	20	22.7
study hard / hardworking	12	13.6
polite	7	7.9
handsome / beautiful	5	5.7
good	4	4.5
active	4	4.5
have positive attitude	4	4.5
brave	2	2.3
kind	2	2.3
cheerful	2	2.3
honest	2	2.3
good at English	1	1.1
clever	1	1.1
down to earth	1	1.1
<i>Neutral attributes (n=17, or 19.3%)</i>		
cannot speak English / Malay	3	3.4
tall	2	2.3
look different	2	2.3
always give opinions in class	2	2.3
rich	2	2.3
have different culture	1	1.1
shy	1	1.1
not shy	1	1.1
formal	1	1.1
always ask questions	1	1.1
not formal	1	1.1
<i>Negative attributes (n=4, or 4.5%)</i>		
not friendly	1	1.1
communicate between themselves only	1	1.1
dependent	1	1.1
arrogant	1	1.1

As the answers attest, the local students' attitudes towards and perceptions of their international peers were overwhelmingly positive ( $n=67$ , 76.1%). The majority of the items in this category related to the international students' personal characteristics, with such qualities as "friendly" and "polite" at the top of the list. Some descriptions related to the typical behaviours, the most notable of which was "study hard / hardworking". There was only one physical description in this category, which was "handsome / beautiful".

In the neutral answers category, the most frequent statement was "cannot speak English / Malay", which pertained to a perceived typical behaviour. Other behaviour-related characteristics described the international students as being outspoken and inquisitive ("always give opinions in class", "always ask questions"), portrayed them – somewhat contradictory – as being "shy" / "not shy", and "formal" / "not formal". The neutral category contained two demographic characteristics, namely, "rich" and "(they) have different culture" and two items related to the physical appearance ("tall", "look different"). Finally, in the negative opinions category, three out of four items described the international students' personality characteristics ("not friendly", "dependent", and "arrogant") while one item related to a perceived typical behaviour ("communicate between themselves only").

### **3.3. Statistical Analysis: Social Interaction between the Domestic and International Students**

The analysis of the quantitative data obtained from the answers to Questions 2–6 revealed that social and academic interaction between the domestic and international students were either weak or non-existent. The majority of the respondents ( $n=14$ , 51.9%) replied that they had never done things socially with their international peers. Four respondents (14.8%) chose the answer "seldom" while eight (29.6%) marked the answer "sometimes" to describe the frequency of their socializing with the foreign students. Only one student (3.7%) replied that she often socialized with the international students. None of the host students reported daily social interactions with their foreign peers.

A similar situation transpired regarding academic-related interaction and the group work between the domestic and international students. Fourteen respondents (51.9%) reported that they had never cooperated with the foreign students on their assignments or homework. Six respondents (22.2%) were seldom and other six respondents (22.2%) were sometimes involved in academic activities with their international peers. Only one student (3.7%) replied that she had often cooperated with the international students on her assignments. None of the students had studied or done their homework with the foreign students on a daily basis.

The data attested that the situation with a casual interaction between the local students and their foreign peers was somewhat better. Only four (14.8%) respondents revealed that they had never talked or chatted with the international students. Three participants (11.1%) had done so often, nine (33.3%) chose the answer “sometimes”, and eleven (40.7%) ticked the “seldom” scale. None of the respondents stated that he or she talked or chatted with the foreign students every day.

Regarding the local students’ number of friends who are international students, one respondent (3.7%) had more than ten such friends, 15 respondents (55.5%) had up to ten friends among the foreign students, while 11 respondents (40.7%) reported that they had no such friends. To Question 6, which asked whether there were international students in the respondents’ programs, 9 students (33.3%) answered positively while 18 students (66.7%) gave a negative answer.

The overall favourability towards the international students measured on the thermometer-type scale (question 7) was moderately positive, at 61.4 degrees. Considering the participants’ overwhelmingly positive descriptions of their international peers in response to Question 1, this was lower than could be expected. Twelve respondents (44.4%) marked their attitude towards the international students in the middle of the ‘thermometer’ (from 40 to 60 degrees), which was considered by the researchers as rather ‘lukewarm’. Seven respondents (25.9%) placed their marks between 60 and 80 degrees, which was within a ‘warm’ and positive range, while the marks given by 4 respondents (14.8%) ranged between 80 and 100 degrees, which was construed by the researchers as a ‘very warm’ and positive attitude. One respondent (3.7%) had a very negative attitude (from 0 to 20 degrees) while three respondents (11.1%) had a rather negative attitude (from 20 to 40 degrees) towards their international peers. It should be noted that there was a negligible difference in the overall favourability ratings of international students between the respondents who had the international students in their academic programs (average 60 degrees) and those who had not (average 58.5 degrees).

#### **4. Discussion**

This study aimed to seek Malaysian students’ perceptions of their international peers (research question 1) and to find out whether social and academic-related interactions between the two groups of students were robust (research question 2). The students’ answers to research question 1 attested that they had a very good opinion of the international students and the descriptions provided were overwhelmingly positive; “friendly”, “hardworking” and “polite” topped the list

of qualities ascribed to the international students in UMS. It is interesting to note that these qualities are highly valued in Malaysian culture (Rashid and Ho, 2003). Overall, the majority of positive descriptions of the international students provided by the respondents were related to the personal qualities (e.g., “good”, “active”, “brave”, “kind”, and “cheerful”). One would expect that such positive perceptions would be supported by a robust interaction.

However, the answers to research questions 2–5, which assessed social and academic-related interaction between the domestic and foreign students, revealed that communication and interaction between them were very weak or nonexistent. A similar problem of the “hi-bye friends” type of behavior involving local and international students has been reported in other studies (Kondakci, Van den Broeck and Yildirim, 2008; Sovic, 2009). In addition, the overwhelmingly positive descriptions of the foreign students by their local peers were not matched by the average and rather moderate ‘temperature’ on the thermometer-type favourability scale.

A possible explanation of these contradictions in the findings could be that the participants might have suppressed their negative feelings and had given more socially acceptable responses while answering the open-ended questions about other people’s qualities (cf. Spencer-Rodgers, 2001). The fact that the commonly valued in Malaysian culture personal qualities of being “friendly”, “hardworking” and “polite” were often ascribed to the foreign students (making 40% of the total answers) lends some support to this proposition. On the other hand, it is also possible that the home students expressed a genuine liking of their international peers but had had limited chances to communicate with them or had been hampered by their own shyness to talk to foreign students. Future studies may want to explore this problem in greater depth.

The present study has some limitations. First of all, the number of the participants was small, and they were domestic students only. A larger number of participants might yield results different from those of the present study. Also, including the opinions and experience of foreign students could give some illuminating insights into the issue. Conducting interviews would be a good way to gain a better understanding of the domestic and foreign students’ interaction patterns and problems. However, despite these limitations the findings do highlight some important implications for institutional policy with regard to the internationalization program.

It is indisputable that international students need to make considerable efforts to adapt to the host country’s cultural norms and lifestyle. Some programs for prospective international students conducted prior to their departure for studies

abroad would be beneficial for enhancing students' intercultural awareness (Ünver, 2007). At the same time, the host institutions need to take all necessary measures towards making the international students truly a part of the campus community. On the personal daily communication level, the host country students may need to be encouraged during the orientation programs to get to know their international peers better. In the classroom, the lecturers may want to give assignments or group projects that would require cooperation between the domestic and international students. The administrators may want to provide more space for student activities in the campus; this could include exhibition booths or venues where international students could prepare expositions about their home countries, conduct cultural events or hold informal discussions with their local peers. Such extra-curricular activities and informal meetings may offer a good platform for the students to get together, to know each other and to develop their intercultural knowledge and skills.

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## The Technical Competence and Technical Profession Preference of Boys and Girls in the Czech Republic

### Abstract

The article is a summary of the extensive research into a technical competence and technical profession preference of the senior primary grades. In total, 1650 pupils from 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grades of the Moravian Silesian Region of the Czech Republic participated in the survey. Standard psycho-diagnostic methods were used. In addition, a new method for measurement of technical and practical comprehension was created. Our results show that there are no differences between girls and boys in intellectual abilities within the frame of single subtests. However, statistically significant differences only appear in psychomotor tempos kills and visual perception in favor of girls. Boys have got higher performance in the test of technical and practical understanding.

**Key words:** *technical talent, technical thinking, psychological test, professional orientation, gender, the Czech Republic.*

### Introduction

The Czech Republic is a region with a long tradition of industrial production. Therefore, it is well-known for its high quality engineering products. However, social changes have made people lose interest in technical professions. The number of qualified experts in the technical fields has decreased and so has the number of apprentices in training institutions. Thus, there is a real threat that the Czech Republic will lose its competitiveness in technical sciences. Consequently, there is

a danger that the development of new industrial activities will be suspended, and eventually production in already existing industrial companies will be reduced. There is a need to identify talented pupils and encourage and support their interest in technical sciences from early childhood. We assume that they are the people who will choose technical professions. The authors of this article, in co-operation with the Methodological and Evaluating Centre, conducted unique research into the technical abilities and professional orientation of senior primary graders in one of the most industrial regions of the Czech Republic, namely the Moravian Silesian Region. The conceptual frame of the technical comprehension was derived from the basis of the already existing theoretical models which have stood the test of time in foreign research (Benbow, Lubinski, 1993; Dawis, Lofquist, 1984; Dyrenfruth, 1990; Hansen, 2007). The following three components that correspond to the dimensions of technical thinking have been found in these studies:

1. Technical knowledge (Technological and technical understanding, knowledge of basic principles and inherent law. It refers to the cognitive dimension of technical thinking).
2. Technical competence (Psychomotor skills, tactile and kinesthetic abilities and practical intelligence. It refers to the conative dimension of technical thinking).
3. Technical will or “the drive to be active, enterprising and assertive”. (It refers to the affective dimension of technical thinking and includes emotion, motivation, values and personal qualities).

Thus, high quality technical thinking involves knowledge, competence and emotional engagement. Furthermore, there is a need to consider the equally important factor – gender stereotypes. A lot of pupils, especially girls, do not use their potential in an appropriate way. Therefore, we may expect that boys will be markedly attracted to the technical domain, whereas girls will rather choose the social and aesthetic domains. If there are girls with outstanding technical skills (but a conservative social role makes their fulfillment more difficult), we will support them and encourage them to use their potential.

## **Research aims**

The aim of our study was to evaluate the pupils in the following categories: 1. Sensitivity in dealing with technical problems, 2. sufficient intelligence, 3. future professional focus in technical fields. The results from these three categories give information about the level of technical thinking of the pupils of senior primary

grades; Czech children's interest preferences; and especially a practical outcome – use of psychological methods to help to identify pupils with a comprehensive predisposition for assertion in the technical area with the purpose of correct alignment of their professional choice.

## **Research sample**

For the sake of uniform regional distribution we chose 17 schools, 87 grades in the Moravian Silesian Region in the Czech Republic, respectively. The schools were located in small villages as well as in large cities. Minimum computer equipment was the limiting factor for inclusion of a school in the research sample. Data are reported for 1650 pupils of senior primary grades aged 12–16 years. Incomplete data and data which was created in a non-standard way was excluded from the file (e.g. cheating, a broken arm, which has an impact on the test of psychomotor tempo, etc.). The file that was created after exclusion of these data comprised 1605 pupils (boys: N=787; 6<sup>th</sup> – 8<sup>th</sup> grades; 12–16 years of age; girls: N=818; 6<sup>th</sup> – 8<sup>th</sup> grades; 12–16 years of age) and their data was further processed statistically.

## **Methods**

**General Aptitude Test Battery (GATB)** – it is a selection of particular parts of the GATB, which was used in the USA and was adapted to our environment by Vašina and Komárková (Vašina, Komárková, 1975). Each of the children was tested by four subtests that measured selected special skills, such as spatial imagination, visual perception, logical and mathematical skills and verbal skills.

**Test of Psychomotor Skills (a component of GATB)** – it tests psychomotor skills and movement coordination. The number of squares correctly filled up by the subject within the time limit of 60 seconds was evaluated.

**Test of Technical-Practical Understanding (TTPP)** – this is a newly created test that consists of 30 pictorial tasks requiring basic mechanical and physical relationships comprehension. The tested person chooses one correct answer from a few possibilities. This test was created as a screening method for evaluation of technical and practical abilities. The design of the test was based on several former test concepts created in the past (Miglierini, 1991). The test includes simple physical and practical exercises from different areas (friction, pressure, stability, rolling resistance, swipe, etc.). Test reliability was verified within the pilot research

on pupils ( $n=67$ ) by the system of test-retest with an interval of 10 months. The test shows reliability at  $r=0.76$  level. Content validity is adequate considering the achievement character of the test and its pedagogical orientation (the test contains modified tasks based on an awareness of the content of the curriculum that must be correctly applied by the pupil; it is not enough to remember it).

**Test of Interests Structure (AIST-R)** – it is a standardized method for diagnosis of pupils' professional orientation. The test is based on Holland's hexagonal model of professions and personality types. Its components are six basic types oriented to a certain lifestyle. We concentrated especially on "R – Realistic" scale evaluating interests in crafts and the technical type of persons who enjoy working with their hands and "I-Investigative" scale evaluating also interests in natural science problems, their proximate analysis or interest in a life orientated towards science. The interesting results were obtained also for "A – Artistic" scale (evaluating interest in artistic activities), "S – Social" scale (evaluating interests in other people), "E – Enterprising" scale (evaluating interest in management and business) and "C – Conventional" scale (evaluating interests in professions related to abidance by rules).

## **Measurement**

Individual psycho-diagnostic methods were administered in the above-mentioned order. The testing time was 90 minutes with one 5-minute break. The testing was performed during lessons with the help of specially trained staff and according to a common manual (Badošek, Bielek, Kimplová, 2009). The testing battery was created and administered in the computer version, only the psychomotor tempo test was administered in a pencil and paper form. The number of simultaneously tested children was limited by the number of computers in the classroom. In addition, certain demographic and sociological data, such as age, sex, primary school grade, school membership and a type of school where the pupils wish to study further, were monitored during the research.

## **Results**

The student's t-test of two independent files was used for statistical verification and parametric variables calculation. In the case where results showed nonparametric character Kolmogor-Smirnov's test for two huge files of different content

was used. The following tests – BTZS (GATB), TTPP and AIST – R were evaluated in this way successively.

### **BTZS (GATB)**

Subtest of spatial imagination – no statistically significant discrepancy between the boys and girls in particular grades was found. Subtest of arithmetic – no statistically significant difference between the boys and girls occurred. Subtest of verbal skills – no statistically significant discrepancy between the boys and girls was found out.

The g-factor (intelligence) was calculated from these subtests. Thus, we can say the results of the g-factor measurement between the boys and girls are equivalent, i.e. without statistically significant differences. We may argue the boys and girls obtained comparable results within the frame of particular subtests and thus we can claim that the very frequently presented division of intellect forms of the intelligence test (BTZS) into the man intellect form and woman intellect form is not valid.

Subtest of visual perception – statistically significant differences were found in all the tested grades (cf. Table 1). In all the cases better results were obtained by the girls.

Subtest of psychomotor skills – statistically significant differences were found in this test (cf. Table 2). The girls performed better in all the grades and their superiority was greater at an older age. We found lower achievement of the boys, by about 6 points, in all the age categories. The increased achievement in manual routine activity contradicts the general expectation of male dexterity.

### **TTPP – Test of Technical-Practical Understanding**

Statistically significant differences between the girls' and boys' performances became evident in this test. When we compared the achievements of the boys and girls, the boys were always better in individual grades and statistically significant in all the cases  $p < 0.01$ , cf. Table 3. Nevertheless, the difference between the boys' and girls' results is not noticeably great and in practice might not have any substantial influence. For instance, the boys from the 6<sup>th</sup> grade (14.14; SD=4), and the girls (12.91; SD=3.33;  $t=3.821$ ;  $p < 0.01$ ). In the remaining grades the difference between the boys and girls increases and is statistically significant. In spite of that,

irrespective of the biggest difference (8<sup>th</sup> grade) the boys' performances do not exceed the average achievements of the girls by more than 10%. And that is not sufficient justification of the smaller participation of girls in technical fields due to a minor inability to solve technically focused tasks. It is obvious that stratification of technical and practical skills corresponds to normal distribution (cf. Figure 1), which describes the results obtained in the 6<sup>th</sup> grade. Similar results were obtained in other grades, however, with progressive spacing of Gaussian curve tops between the data of the boys and girls. Even though there are fewer boys in the 6<sup>th</sup> grade, it is obvious that the best performances in the test are made only by the boys. Because of the maximum number of obtainable points in the test (30), the pupils' average performance shifts within 12.91–16.83 points, which is almost half. We can talk about the good test setting. The test is neither easy nor difficult and differentiates the selected area well.

The performance was monitored within individual sexes depending on the age (Figure 2). Whereas the boys showed a visible continuous increase in the achievement in TTPP test, i.e. the ability to solve technically oriented tasks from the 6<sup>th</sup> to 8<sup>th</sup> grades, the growth finishes in the 7<sup>th</sup> grade for the girls. Between the 7<sup>th</sup> and 8<sup>th</sup> grades there is no statistically significant difference ( $t\text{-stat.}=0.727$ ;  $t\text{-crit.}=2.576$ ;  $p < 0.01$ ).

## **AIST-R**

While investigating the results obtained in this test, we made many interesting observations (for the purpose of this article we have chosen only the most essential information). Because of the results which did not correspond to normal distribution, we had to use Kolmogorov-Smirnov's test for non-parametric data. Minimum statistically significant criteria for this test and particular grades: stat. crit. for the 6<sup>th</sup> grade  $D\alpha=0.143$ ; stat. crit. for the 7<sup>th</sup> grade  $D\alpha=0.140$ ; stat. crit. for the 8<sup>th</sup> grade  $D\alpha=0.140$ ; all for  $p < 0.01$ .

**Spectrum: R – Realistic:** statistically significant differences were found between the boys and girls. Data according to normal distribution was obtained only for the boys. The girls in most cases completely declined professional activities that led to practical activities (cf. Figures 3 and 4). For clarity, graphs from the file of the 7<sup>th</sup> grade were selected. However, practically the same results may be found in both the 6<sup>th</sup> and 8<sup>th</sup> grades.

**Spectrum: I – Investigative:** no statistically significant differences were found between the girls and boys in the 7<sup>th</sup> and 8<sup>th</sup> grades. Statistically significant dif-

ference in the 6<sup>th</sup> grade between the boys and girls was very tight and therefore we had to consider the result thanks to the lower differentiation ability of non-parametric tests with reserve. The distribution according to the obtained scores shows a normal distribution for the girls and boys as well. Within this dimension there is no difference in the preferences for the investigative type of professions between the boys and girls, especially if it deals with older pupils.

**Spectrum: A – Artistic:** there is an obvious inclination of the girls towards artistically oriented professions. In all the classes (and also in all the age groups) this inclination is statistically significant in all the grades (Figures 5 and 6).

**Spectrum: S – Social:** in the dimension of heading towards social profession interests the girls obtained statistically significant higher scores than the boys. A stratification of the answers in S scale is the same as in graphs 5 and 6 of A Scale. It shows an unambiguous refusal of socially oriented professions on the part of the boys.

**Spectrum: E – Enterprising:** it shows that the girls have got higher scores in the interest in professions that require activity, a spirit of enterprise and a leading approach. It is statistically significant in two cases (6<sup>th</sup> and 7<sup>th</sup> grades).

**Spectrum: C Scale – Conventional:** no statistically significant difference between the boys and girls was obtained.

## **Discussion**

**BTZS** – we could not prove the significant difference between the boys and girls statistically, so we cannot agree with Benbow, Lubinski's (1993) allegation about better performances of boys in spatial imagination tests and about better performances of girls in verbal tests. Also, non – interlaced wattage difference in arithmetic with reference to sex, in spite of evidently existing significant discrepancy between sensation education mathematics boyhood plus girls, as Turska, Bernacka (2010) report.

**TTPP** – our analysis revealed that the performance in this test correlates best with spatial imagination ( $r=0.4$ ;  $p<0.01$ ). It also correlates with verbal aptitudes ( $r=0.32$ ;  $p<0.0$ ) and mathematical aptitudes ( $r=0.29$ ;  $p<0.01$ ). To a great extent the success in this test is saturated with intellectual aptitudes but not absolutely. The rest comes within the sphere of a specific skill – technical and practical comprehension. The boys' better result in TTPP correlates with the common expectation, however, they are not better than the girls to such a degree as to explain the girls' low representation at schools with technical subjects by it. It seems that only

knowledge itself of the technical and practical principles is not the most important factor for the choice of technical schools.

**Psychomotor skills** – in comparison with the initial hypothesis we did not find any significant correlations with technical skills. Performance is related to gender – the girls show a demonstrably higher amount of work done at the time given. Age is another indicator. A characteristic relation was found – the older the children are the higher performance in the psychomotor skills test they achieve. We may agree with Dyrenfurth (1990) and Layton (1994) that technical competence is partly created by psychomotor skills, only under one condition namely the test does not deal with simple ways of psychomotor skills measurement. According to our prerequisite, for technical practice it is more suitable to use a constructional approach (building construction kits on time or similar) because simple psychomotor skills show more about perception and withstanding. Thus, it might not be a coincidence that psychomotor skills correlate with visual perception the most ( $r=0.27$ ;  $p<0.01$ ) which is girls' domain.

**AIST R** – it is obvious that in some cases the outcomes of the AIST-R show a significant deviation from the normal distribution. It seems to be interesting that the left-slip or right-slip faults of the Gaussian curve were found in individual dimensions only for one gender while for the other gender it occurs within a normal distribution pattern. In such a case we can expect that the clean – cut election (especially in spectrums R, A, S) affects other terms than only inborn abilities. In such a case we might expect that different circumstances, other than evolved aptitudes, have an influence on strong selection (especially in R, A and S Scales). There is a question why the girls react with outright disapproval to realistically oriented answers while the boys react with similar levels of disapproval concerning artistic and socially oriented activities. There are at least two speculative explanations: Social roles enforced by community manipulate the opinions of the tested subject more than could be expected. There are improperly and unevenly formulated questions in the test.

Within the frame of investigation of the reciprocal correlations within the test, interesting data regarding individual categories cohesion appeared. A quite separate category is R category – a realistic type that has been liked very little to other categories with the exception of Scales I and C. The remaining categories correlate positively with every other category ( $r=0.39-0.73$ ). The reasons for this moderately marked relation are not obvious; however, answers might be found in a division according to additional criteria or already planned data mining.

## **Conclusion**

In conclusion, we can say that the results of some tests are substantially different in other research. The differences are significant particularly in our research on the intellectual part of BTZS/GATB. These outcomes prove that there are no gender differences in the verbal and visual parts of this test. The results of the AIST-R test show the legitimacy of our assumption that despite the talent equality women will not attain development of the same potential in certain professions as men. Many girls do not use their potential in adequate ways, in keeping with the gender stereotypes. Girls show noticeable lack of interest in practical and technical professions, although the girls' result in the test of technical thinking was decreased merely by about 10% in comparison with the boys. However, a prognosis of the girls' performance is a decreasing tendency in association with increasing age. We can claim that it is caused by gender pressures on the conventional female role. The conventional female role goes through very important development especially in pubescence. It causes girls to lose their interest in the so-called "male activity". It is surprising that the girls obtained higher scores in the "Enterprising" scale than the boys, which may indicate the girls' higher spirit of enterprise and probably pragmatism. The girls also show better performance in the psychomotor tempo test, which means that the girls have a stronger will and better skills in routine motor tasks than the boys. Research also shows that good intellect, manual skills and understanding of practical and technical relationships do not have an influence on job selection. These findings are a challenge for pedagogues and career masters to motivate and encourage children with high quality potential regardless of sex.

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## Appendix

**Table 1:** BTZS – subtest: Visual perception

	boys	boys SD	girls	girls SD	difference	t- stat.	p
6 <sup>th</sup> grade	21.10	5.46	22.5	5.42	-1.25	2.612	p < 0.01
7 <sup>th</sup> grade	22.37	5.43	24.94	5.03	-2.57	5.731	p < 0.01
8 <sup>th</sup> grade	23.41	5.47	25.60	5.27	-2.19	4.739	p < 0.01

**Table 2:** Psychomotor tempo test

	boys	boys SD	girls	girls SD	difference	t- stat.	p
6 <sup>th</sup> grade	55.49	10.70	61.14	12.61	-5.65	5.461	p < 0.01
7 <sup>th</sup> grade	59.82	10.88	65.76	10.24	-5.94	6.560	p < 0.01
8 <sup>th</sup> grade	61.74	9.96	68.12	10.87	-6.38	7.131	p < 0.01

**Table 3:** Performance in TTPP Test

	boys	boys SD	girls	girls SD	difference	t- stat.	p
6 <sup>th</sup> grade	14.14	4.00	12.91	3.33	1.23	3.821	p < 0.01
7 <sup>th</sup> grade	15.75	4.11	14.31	3.64	1.44	4.332	p < 0.01
8 <sup>th</sup> grade	16.83	4.00	14.54	3.72	2.29	6.886	p < 0.01

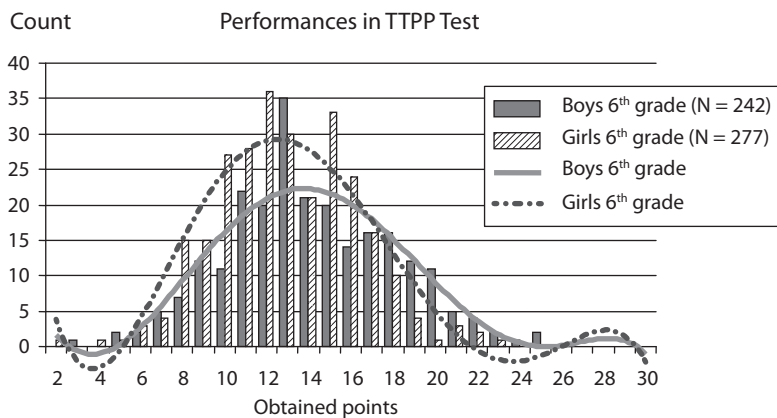


Figure 1: Performance in TTPP Test

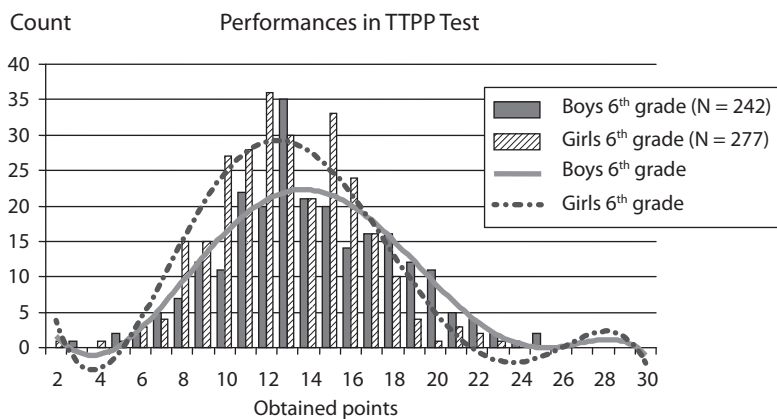


Figure 2: Performance in TTPP Test according to grades

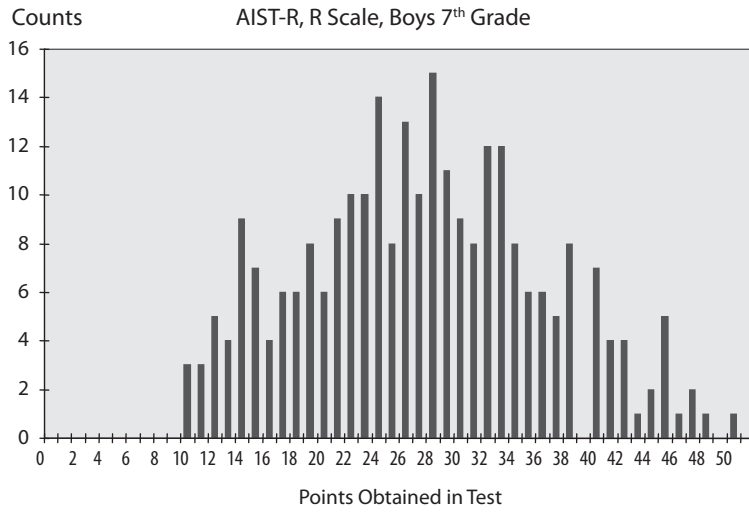


Figure 3: AIST-R, R scale, boys, 7<sup>th</sup> grade

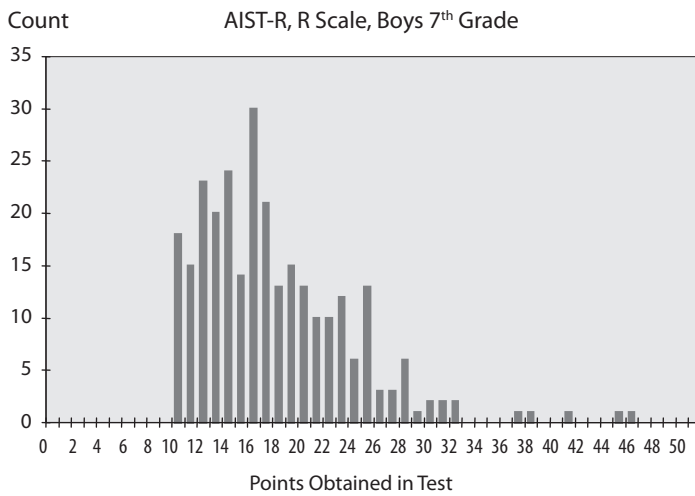


Figure 4: AIST-R, R scale, girls, 7<sup>th</sup> grade

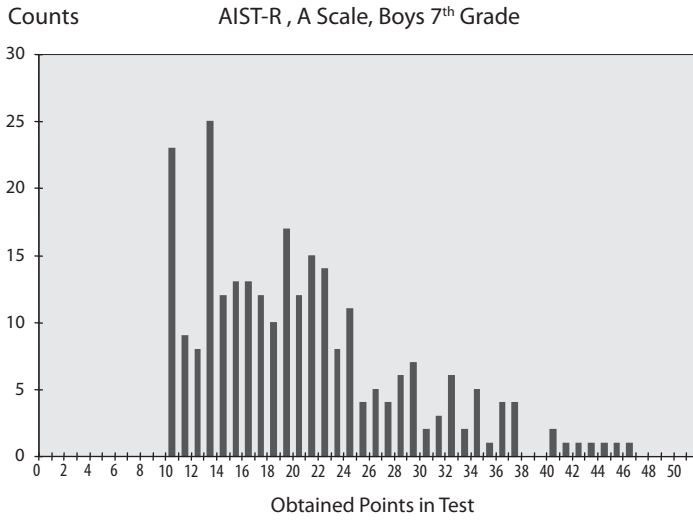


Figure 5: AIST-R, A scale, boys, 7<sup>th</sup> grade

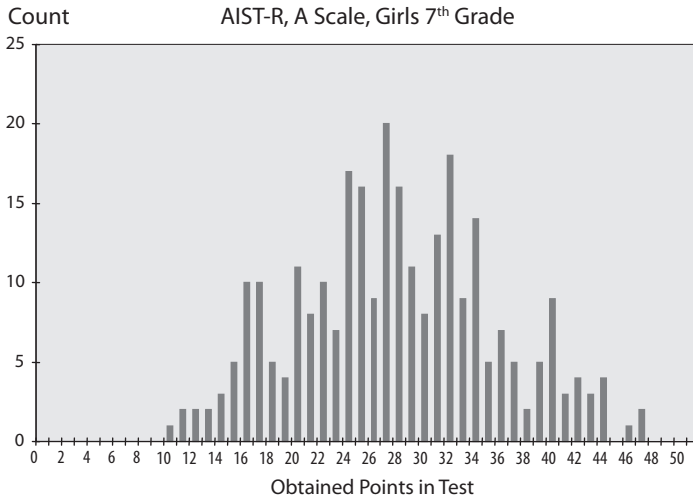


Figure 6: AIST-R, A scale, girls, 7<sup>th</sup> grade

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## **Impact of Education Policies to Incorporate ICT as Innovative Agents in the Classroom: Advantages and Drawbacks**

### **Abstract**

This article offers part of the results obtained from a project titled “*Study of the impact of the ICT project from the teachers’ and students’ point of view, in the early years of its implementation in public centres in Andalusia*”, the main purpose of which was to analyse the impact of ICT incorporation plans in education centres, from the experiences of the main actors in that environment.

The results shown here are those obtained with regard to the advantages and drawbacks that such education policies brought about in education centres.

The results show that the advantages and drawbacks found by teaching staff and students are different, as what each collective expects does not always coincide with the day to day reality in the centres that have implemented these plans.

**Key words:** *ICT, innovation, education policies, impact.*

### **1. Introduction**

This study forms part of the research carried out under the project titled “*Study of the impact of the ICT project from the teachers’ and students’ point of view, in the early years of its implementation in public centres in Andalusia*” (SEJ-462 Project funded by the Autonomous Government of Andalusia), the main purpose of which was to analyse the impact of ICT (Information and Communication Technologies) incorporation plans in education centres, from the point of view of experiences of the main actors in that environment, namely teachers and students. One of the

objectives of that project was to analyse the advantages and drawbacks that such education policies caused in education centres.

The different strategies and determining factors that contribute to the use of ICT in the classroom have traditionally been studied with the main focus on the pedagogical innovations carried out with ICT (Wong, Li, Choi, & Lee 2008; Kozma & Anderson, 2002); research has also been carried out that has shed some light on the benefits of the use of ICT in the school environment (Tubin 2006; Kozma, 2003; Kozma & Anderson, 2002) and the importance of different Administrations' education policies concerning correct use of ICT in the classroom (Drent & Meelissen 2008; Hew & Brush, 2007; Jones, 2003). Current studies are aimed at analysing what teachers do to modify the curriculum and learning, and to do so it is important to analyse the beliefs and expectations concerning the use of ICT, as any change in school routines is no easy task.

In today's knowledge society, new professional profiles are needed which can adapt to education centres' new requirements. As Marcelo and Estebarez (1999) point out, the skills acquired by teaching staff in their initial training quickly become obsolete if the teacher stops striving to continue acquiring knowledge, so training and learning represent a constantly growing challenge that is giving rise to a new market of lifelong learning.

The presence of ICT in the school environment is growing increasingly common, to the point that it is now considerably widespread. Installation in schools has increased progressively; the centres have, on many occasions, achieved the installation of ICT through forming part of projects such as the Atenea, Mercurio, Platea or Mentor Projects, or as ICT Centres, ensuring that those centres have greater technological infrastructure in exchange for a commitment to implementing ICT in teaching practices and to carrying out innovative ICT-related work so that they can subsequently be included in the curriculum.

According to a study by Drent & Meelissen (2008), in which the factors that obstruct or stimulate the innovative incorporation of ICT in schools are analysed, most teachers feel that the *motivation* factor is one that can most favour the use of ICT in an innovative way in the classroom.

In many teachers' opinion, teacher training is the first hurdle to overcome. There is a general belief that when they eventually start to make use of the computer tools, they will find them to be obsolete. Consequently, teacher training and refresher courses to meet teachers' needs are necessary.

Education needs to adapt to the existing technological revolution and, therefore, teacher training is crucial from the moment in which teachers become purveyors of knowledge and have to be skilled in the latest ICT developments.

So we could conclude that teachers are highly motivated in ICT matters, but there is still a lack of training in this field. This lack of training is one of the main drawbacks to the adequate incorporation of ICT in teaching practices, alongside slow Internet connection. In spite of everything, ICT are considered to be a major incentive in improving teachers' professionalism, particularly in meeting the demands of society itself.

## **2. Methodology**

Our research unfolds within the varying qualitative perspectives that overlap due to the nature of the study, but which are also different as regards the nuances of the questions analysed and the objectives set therein.

In general terms, our study comes under the phenomenological perspective (Buendía, L. , Colas, P. & Hernández, F. , 1997) as it aims to compile the experiences of the people in the centres with the ICT project (students, teachers and project coordinators) through their stories, reflections, perceptions and opinions. From these experiences we can gather how the innovation projects and changes are experienced in school contexts, which will be interesting both for future projects and to find out what is happening in the context in which the changes are taking place.

Our research also comes under an ethnographic perspective as it aims to compile data about what the project participants are learning and which is expressed in behaviour patterns or standards. This made us engage in a longer study in the centre where we were carrying out the case study, in which the teaching staff and the students showed these behaviour patterns or standards that were analysed by means of informal interviews, observations, etc. over time.

It is consequently in line with a communication ethnography perspective (Buendía, L., Colas, P. & Hernández, F., 1997) because we are interested in the fundamental principles of the classroom organisation and the cultural patterns of organisations (school organisation) and how people interact and develop processes of educational communication (classroom and institution). This also required a longer stay at the school and the usual information collection techniques in these cases: log, interviews (open, casual, formal, etc.) as in similar research studies prior to this one (Sancho, J, 1998).

The chosen method was multicase, also called collective case study by Stake (Stake, R.E. , 1998) or multiple case study (Bogdan & Biklen, 1982; Rodríguez, G. , Gil, J. & García, E. , 1996). According to the latter author, the aim is to gener-

ate theories, comparing and testing the extracted hypotheses in a context within diverse contexts. In our case, we endeavoured to compare and verify the effect of the ICT project that was set up by the education administration of the Autonomous Government of Andalusia in the individual and different contexts of public centres in the province of Malaga (Spain). We took one of them as the main reference for other centres in the province, and subsequently in Andalusia.

In other words, the main centre in Campanillas was taken as the exploratory case study from the outset, and the other centres (Malaga province and Andalusia) were taken as multiple case studies that confirmed our observations at the main centre. This multiple case study aimed to give more strength in terms of Yinn (1984) to replicate and verify the questions and observations carried out at the main centre (Figure 1).

Constant comparison suggested by Bogdan & Biklen (1982) between the different centres in the province of Malaga, Andalusia and the main centre, aims to generate theory by verifying the hypotheses extracted in a context within diverse contexts. It is true that this diversity of centres may imply a certain degree of methodological difficulty, as they are case studies and in that they are independent and do not lend themselves to comparison.

The methodology we followed was intended to form a permanent feedback loop starting as level III geostrategic or main centre, or case study in the main centre, and visiting the different levels (levels I and II) before returning to level III to redefine the objectives, instruments and conclusions from the data analysis.

In this way we will verify the similarities and differences produced by the ICT project on the objectives set out in the different centres in the province of Malaga and Andalusia. This feedback process in the analyses is shown in Figure 1.

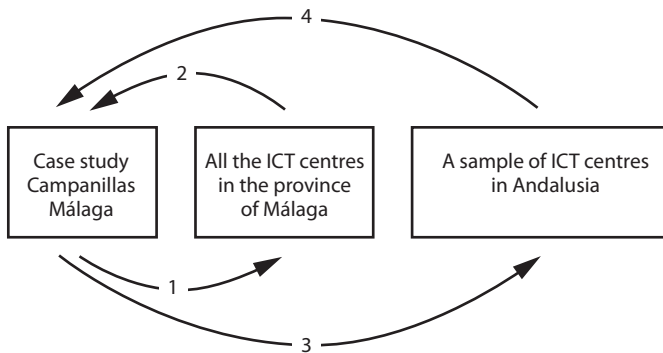


Figure 1. Feedback process

The triangulation technique was used in the following cases:

- Data analysis triangulation (recorded interviews with all the coordinators in the ICT centres in the province of Malaga) by several observers.
- Triangulation of data collection techniques (different techniques for the same objectives).
- Temporal-longitudinal and permanent triangulation as opposed to one-day studies in other centres.
- Triangulation from different sources or different key informants (coordinators, principals, students, teachers).

These triangulations require joint data analysis, following the principles established by Erlandson et al (1993), i.e. a holistic study focusing on the systems' or participants' relationships, referring to personal aspects, the time spent in the context, the expression of the researcher's feelings and his/her ethical commitments, preparation of the instruments from the context and a posteriori, these will all be modified, even in our research, to be applied to wider contexts (Malaga province and Andalusia).

With this validity, we endeavour to answer the question: Do we obtain the same interpretations from the same data but from different researchers? To do so, a trained volunteer group of PhD students carried out similar tasks in the interpretation of data, comparing the results obtained by the researchers in this study with the same data analysed by other researchers.

#### **Information collection instruments and techniques.**

The techniques and instruments aimed to collect the greatest possible quantity and quality of information on the changes that have occurred both in the processes and in the products of the project in the different centres, while at the same time they aim to be permanently focused on the objectives set in its evaluation. The information collection techniques used at the three levels of depth and the key informants are detailed below.

**Level I.** Population of all the ICT centres in the first two calls in Andalusia. The total amounts to 150. Out of this population, 10 were selected from other provinces.

**Level II.** All the ICT centres in the first two calls in the province of Malaga. The total amounts to 15 centres (4 Primary and 11 Secondary). The following instruments were used in these visits:

- 15 interviews. Individual, semi-structured interviews with key informants (project coordinators).
- Questionnaires to students. Online system.
- Opinion questionnaires to teaching staff. Online system.

- Visit protocol. Collaboration contract between the research team and the centres.

**Level III.** In-depth case study over time in the main centre in Campanillas.

- Opinion questionnaires on paper to teaching staff: one at the start and another at the end of the first year.
- Questionnaires on paper to students: one at the start and another at the end of the first year.
- Individual, semi-structured interviews with key informants (permanent teachers).
- Field Log. ICT project coordinator log.
- Analysis and study of the documentation that was produced (ICT project presented by the centre, documentation concerning the call, School Curricular Project, historical study of the centre, material and software, etc.).

### **3. Results**

The quantitative results obtained were analysed using the SPSS statistics package. Descriptive analyses and contingency tables were used, which gave us frequencies and percentages of the analysed variables.

The results given below were obtained from the studies carried out, and are arranged according to our research objectives. First we will deal with the advantages and drawbacks that the teachers found, and then we will analyse the students' points.

#### **Advantages and drawbacks that teachers and students found with regard to the ICT project**

We analysed the advantages and drawbacks found by the teaching staff as regards the project to incorporate ICT in teaching practice. To find out the teachers' opinion in this respect, they were divided into different sub-variables.

Firstly, we will show the drawbacks found by the teaching staff in the project development, and then we will deal with those found by the students.

- *Descriptive statistics: teachers*

**Table 1.** Descriptive statistics of drawbacks found by the teaching staff

	Total	Mean	SD	Variance
The distribution of the classrooms	258	2.48	2.48	2.048
The Operating System (Guadalinux)	258	2.75	2.75	1.876

	Total	Mean	SD	Variance
The furniture	258	2.46	2.46	1.635
I need more training	258	3.19	3.19	1.337
I have other work	258	3.27	3.27	1.272
There is a lack of teaching material in areas	258	3.40	3.40	1.409

The majority of the responses given by the interviewed parties, as regards the mean, are around the central value (3), both above and below.

- *Descriptive statistics: students*

**Table 2.** Descriptive statistics of drawbacks found by the students

	Total	Mean	SD	Variance
The distribution of the classrooms	3623	2.26	1.386	1.920
The Operating System (Guadalinux)	3623	3.23	1.582	2.501
The furniture	3623	2.41	1.563	2.442
I need more training	3623	2.51	1.371	1.881
They give us more work to do at home	3623	2.77	1.339	1.792

The mean of the responses given by the interviewed parties ranges from 2.26, for the distribution of the classrooms, to 3.23 for the Operating System.

Below there are the descriptive statistics related to the advantages perceived first by the teachers, and then the students, dividing this variable into six sub-variables.

- *Descriptive statistics: teachers*

**Table 3.** Descriptive statistics of the advantages of the project according to the teaching staff

	Total	Mean	SD	Variance
We can access the Internet easily	258	4.25	.869	.755
It changes the teaching-learning method	258	3.24	.830	.689
The computer equipment and installation received	258	3.96	.768	.590
The relationship with the students has improved	258	2.78	.846	.715
I can use the PC better	258	3.46	.950	.903
There is more discipline in the classroom	258	2.65	.968	.936

The means of the different sub-variables show that the teachers' most highly valued advantage is having Internet access in the classrooms, with a mean of 4.25, followed by the computer equipment and installation received by the centre, with a value of 3.96.

- *Descriptive statistics: students*

**Table 4.** Descriptive statistics of the main advantages of the project according to the students

	Total	Mean	SD	Variance
We can access the Internet easily	3623	3.96	1.135	1.288
It changes the teaching-learning method	3623	3.64	1.166	1.359
The computer equipment and installation received	3623	3.82	1.120	1.254
The relationship with the students has improved	3623	2.61	1.318	1.738
I can use the PC better	3623	3.62	1.275	1.627
There is more discipline in the classroom	3623	2.47	1.272	1.617

The means of the different sub-variables show that the students' most highly valued advantage is having Internet access in the classrooms, with a mean of 3.96, followed by the computer equipment and installation received by the centre, with a value of 3.82.

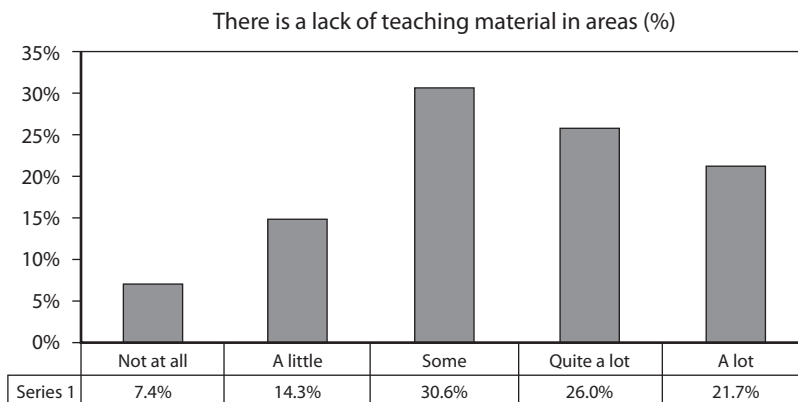
- *The need for more ICT training*



**Graph 1.** Need for training

The teachers considered training to be a drawback in the development of the project to the point of “quite a lot” or “a lot” at a value of 42.7%, whereas those who did not find this to be a problem at all did not even reach the figure of 10%.

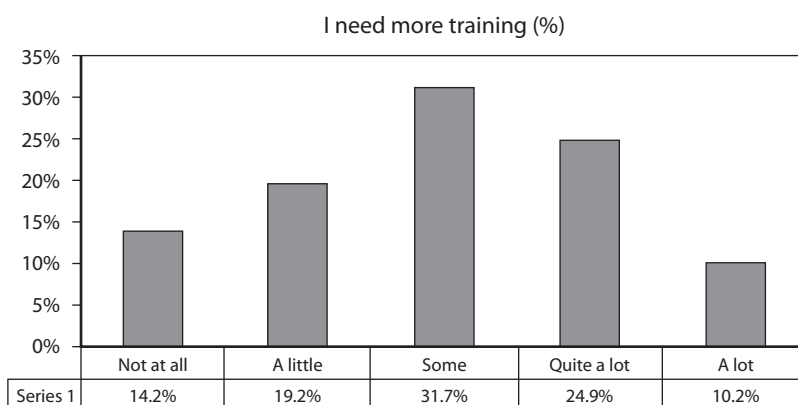
- *There is a lack of teaching material in areas*



**Graph 2.** Lack of teaching material

This is one of the drawbacks that the teachers emphasised the most; only 7.4% of the teachers believe that there is sufficient material.

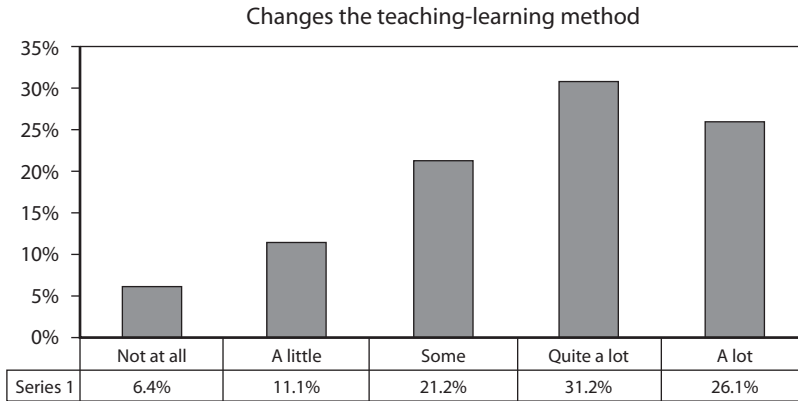
- *The need for more ICT training*



**Graph 3.** Need for more training

The students considered training to be a drawback in the development of the project to the point of “quite a lot” or “a lot” at a value of 35%, whereas those who did not find this to be a problem at all did not even reach the figure of 15%.

- *It changes the teaching-learning method.*



Graph 4. Changes the T-L method

In this sub-variable, the results show that 35.2% of the students believe that the teaching-learning processes are changing “quite a lot” and 26.1% “a lot”.

#### 4. Conclusions

The changes brought about in the education centres were wide-ranging and occurred in different sectors of the school community. The following could be considered to be the most relevant.

One change observed in the teachers was that, after setting up the ICT project, they were able to prepare teaching material to use with computers with the help of specific software. This meant that those who found it hardest to tackle this task changed when they saw their colleagues using certain applications.

The students also expressed a similar experience, both in the immersion and in-depth phases, although it was the primary school pupils who claimed to have increased their ability to use a computer to a greater extent than the secondary students. This could be due to the fact that students study Applied IT in secondary school and that the use of a computer at home is more widespread at that age.

One aspect that we must point out in this section is that many students in the

centre in which we developed the immersion phase are gaining access to computers for the first time (e-inclusion) thanks to the ICT project, as the social/family situation of many students does not allow for such tools to be available.

Communication has also increased significantly, particularly in the case of the students, who claim that they are communicating more with their classmates through the new communication channels, but not to the same degree as the teachers. The teachers placed greater value on the possibility to access more information, through the centres' intranets, websites, etc., than the possibility to communicate more with their colleagues; however, they do work in groups more, using the platforms for this purpose.

Internet access in all rooms is also highly valued by the teachers and students alike, (in fact, search for information online is one of the main uses of the computer in the classroom), alongside the computer equipment and installation received in the centres. Similar results were obtained in the ICT centres in the province of Malaga and in the rest of Andalusia.

One of the teachers' main complaints was the lack of specific teaching material according to area and level. The secondary school teachers demanded this aspect to a greater extent than their primary school counterparts. This is in keeping with the data obtained in the previous section, in which it was revealed that the secondary school teachers made more Internet search than the primary school teachers.

In the interviews with the ICT coordinators in the in-depth phase, they expressed a similar feeling to the rest of their colleagues, and mentioned that one of the main demands they received from their colleagues was the need to have resources classified according to area and level so that they could be used in the classroom, thus avoiding endless search online.

Finally, we believe that the research we carried out may act as a starting point for a future analysis of the differences between the ICT implementation models that have been put into practice.

We hope that all these arguments will change the old mechanisms still existing in some institutions so that ICT could be implemented in teaching practices in a more efficient and satisfactory way.

The project undoubtedly offers many more research possibilities than those considered here, and which we have been unable to tackle due to the limitations of our work. They do, however, form part of a line of ethnographic research with many points of analysis (collaborative work, good practice, impact, etc.) that will open new approaches and lines of work in the future. We hope to continue working on this and encouraging other researchers to do so, to achieve improvements in the quality of education in our public institutions.

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## Perspectives on the Open Educational Resources

### Abstract

This study introduced the open educational resources (OER) aided learning in a computer aided classroom. The course materials included the OER, composed in English, and a textbook translated into Taiwan's traditional Chinese. Furthermore, the OER improved students' conceptual understanding of both language and professional knowledge. Finally, the conceptual color plate analysis was employed to evaluate the related factors among universities, students, and teachers. Based on the statistics of the previous OER studies, it is predictable that OER aided learning may be popular in the future. Besides, the library plays a very important role in life-long learning, and will be crucial in the future because advanced guides and indexing of digital contents and OER can give the self-learner a better tool for life-long learning.

**Key words:** *life-long learning, open educational resources, classroom, globalization, language.*

### Introduction

Although students have different individual talents, instructors always want to introduce them to as much information as they can. The concept is delivered from the era of Plato to nowadays. A low student-faculty ratio (SFR) may satisfy the needs of different students through student-faculty interaction. However, not every institute can achieve the target of low SFR for some specific reasons. SFRs of universities are from 7:1 to 25:1 in North America and Western Europe (Digest of Educational Statistics, National Center for Educational Statistics, USA, 2003), but the ratio can be very high in some specific regions or some countries. A high SFR might improve the educational resource aided teaching (Owston, 1997), whereas

other literature (Devitt & Palmer, 1999; Downes, 2007) presents the advantages and disadvantages of distance education applications. In addition, the open educational resources (OER) easily found in the web become indispensable as the usage of the Internet has been essential in our daily life (Johnstone, 2005). These studies pointed out that there are more and more publications discussing the issues related to OER. Due to the improvement of interactive web technology, OER provide further options of knowledge communications by information services. The OER of developed countries usually provided the professional and technical knowledge, but those of other countries generally introduced culture-specific materials. Websites such as the OpenCourseWare by Massachusetts Institute of Technology, Wikipedia, WolframMathWorld, United National Educational Scientific and Cultural Organization (UNESCO) Virtual University even welcome readers' comments. Most of the feedback has to be written in English, and therefore knowledge exchange from non-native English speakers is limited. In this study, we propose a mechanism to compensate for the lack of the content in other languages on the Internet.

Dettori and Persico (2008) studied detecting self-regulated learning in online communities by means of interaction analysis. The study is crucial research on the creative virtual Lab. On-line materials for learning are convenient, but not suitable to every student if the environment of on-line regular self-learning is not well built. Because some students are not educated as active self-learners, the real classroom learning may be a good learning setting. Therefore, building an environment for self-regulated online learning is a very important issue for distance learning. OER can be transferred in many forms, such as papers, files, PowerPoint, CD-ROM, DVD, and video, etc. Therefore, school libraries might manage OER for the convenience of teaching and learning. This study proposed a computer aided classroom to store OER, and present the materials to the screens of students' computers to guide them towards better learning achievements. Furthermore, Khelifi et al. (2009) pointed out the importance of OER for higher education from the economic point of view, especially for lower developed countries.

## **Methods**

### **A. Textbooks**

The main textbook printed in Taiwan's traditional Chinese (TTC) was a translated version of "Signals and Systems" originally by Professors Haykin and Van Veen (2005). The textbook of the course was written by Professors Oppenheim and Willsky (1997). "Signals and Systems" is one of the most frequently visited courses

on MIT OCW. The core lecture notes were presented by Professor Gray et al. (Course description of Signals and Systems in MIT OpenCourseWare), accessible from MIT OCW. Besides, the instructor introduced the materials from Wikipedia, and WolframMathWorld in the class for students' mathematical reviews.

### **B. OER**

"Signals and Systems" is a course that covers the fundamentals of signal and system analysis with engineering and commercial applications in mathematical models. Some basic mathematical topics, such as unit circle, Euler's identity, and phasor, are the fundamentals of this course. Computer-aided materials from OER, like MIT OCW, Wikipedia, Wikiversity, and WolframMathWorld, which can be accessed on the Internet easily and conveniently, are used to refresh students' memory on these topics. With different presentations and explanations on the same topics from different websites, OER satisfied the needs of various talented students for mathematical knowledge.

### **C. Integrative teaching**

The instructor employed the lecture notes and materials in English from OER, and a textbook in TTC to improve students' English ability in class. This arrangement was aimed to enhance students' English ability through the instructor's explanation and translation of the English vocabulary and sentences.

### **D. Color plate analysis**

The color plate analysis demonstrated the conceptual factor analysis of the questions. The color plate, which combines the red, green, and blue (RGB) colors, is very popular in editorial and image software. It is analogous to a 3-D Cartesian coordinate for quantified presentation, which can clearly display the relationships of the factors when their conceptual relationships are well-established, but hard to quantify. Researchers can easily fill the RGB color of various factors to present their ideas clearly. This study presented the figure of analysis with hyperlinks to present descriptions, pictures, and accounts, which were easily added and constructed systematically.

## **Results**

### **A. Students' comments**

The general comment was "It was a little bit difficult to understand the contents of the lecture notes because OER were written in English", but a few students gave

very positive comments. The demonstrations of the plots and videos actually aided the students to catch on the key points. With the limitation of language abilities, instructors' extended explanation of the course material and English terms was the key to students' comprehension. Dictionaries, machine translators, translation websites, such as dictionary.com and AltaVista, gave students the opportunity to conquer the difficulty of reading.

### **B. The supplements**

Most textbooks presented theories in a formulized form to explain the concept of the theories. The quality and quantity of the selected supplements from OER helped students to learn the concept better. Instructors were able to explain the concepts with diversity, which made it easier for students to understand some abstract theories in the textbooks.

### **C. Conceptual color plate analysis**

The conceptual color plate analysis presented in Fig. 1 shows the factors related to OER aided teaching and the relationship among universities, teachers and students. The model and hyperlink of A1, A2, B1, C1, and C2 can be presented with descriptions of the factors displayed by clicking on the codes of the factors. The hyperlink objects can be any objects in Microsoft Office, and are easy to implement. With this advantage, the conceptual color plate analysis could be employed in many fields, such as commercial applications of analysis and presentation.

## **Discussion**

Foreman (2003) pointed out that information technology (IT) changes lectures in the higher education system. E-learning emphasizes the convenience of anytime and anywhere to learn. Khelifi et al. indicated that most universities are concerned about the cost and performance of commercial software products. Our study demonstrates a simple model of integrated teaching with textbooks and aided OER in a traditional classroom, which is equipped with computer aided tools to obtain the benefits of e-learning, and hence the students gave positive comments in the questionnaire. All the students in this study were part-time students, and working in electronic and computer companies. OER may become resources for their daily life and open a window to the Palace of Knowledge. Figure 1 displays the results of factors in color plate analysis, and further descriptions are presented as follows:

### **A. University vs. instructors**

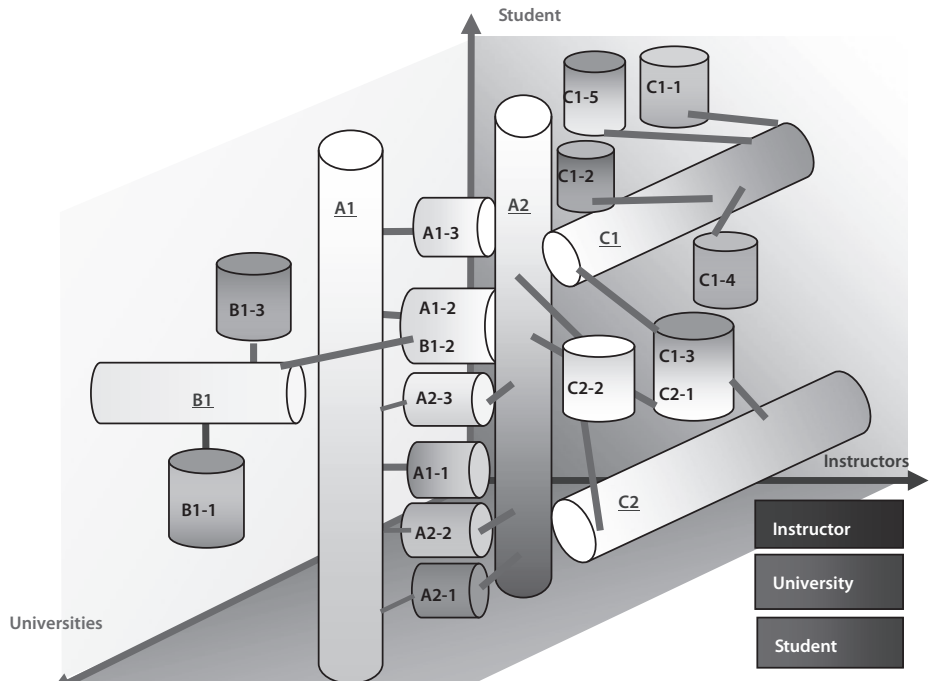
Educational management is an art to support and lead instructors who introduce the “matched knowledge” depending on the student’s interest and talent. It includes curriculum design, course material, instructors’ experience, lectures, students’ learning ability, equipment, and other factors. The contents of OER provided an international standard for lecture material, and enhanced the instructors at universities with a high SFR to improve the quality of course material. Even though the e-learning platform is highly dependent on the instructor’s IT ability, most instructors should be familiar with searching references on the web. Therefore, surfing OER for course material is easier than building a platform or uploading material to the platform for e-learning. OER aided learning can be widely implemented at universities and colleges around the world.

Instructors at universities usually have the obligation to teach students and conduct research in their professional fields. Preparing material for teaching is very time consuming. Some free blogs on the web, such as the Blogger of Google, are a useful tool. The blog allows instructors to put material on through simple processes without spending much time on server settings. Figures, plots, photos, voices, and videos can be uploaded to the blog with simple procedures as well. It simplifies the process of building open educational resources. Clarke et al. (2004) indicated that one of the lessons they learned from their experience at Brunel University is that “distance education programs must be based on existing programs”. OER balance the time between teaching and research by providing free support for course material. Besides, most OER provide the capacity of readers’ feedback. By communicating with other professionals, instructors can get the latest and most refined information. Therefore, it is a wise choice to employ OER for learning.

### **B. University vs. students**

Schrum & Ohler (2005) pointed out that distance delivery techniques would make learning available anywhere without any geographic limitations. Furthermore, globalization is a hot topic at many universities, especially in some NNESNs. Students with proficiency in English can receive higher standings in communities like international entertainment and academic institutions. In a computer-aided classroom, integrated teaching can be accomplished with minimum equipment and cost. Course materials, originally developed in English from MIT OCW, Wikipedia, and Wikiversity, are easily and clearly displayed on students’ individual monitors and controlled by the instructor. In addition, many free tools are very convenient for learning, such as the evaluation versions of software or free educational resources which include National Instruments LabVIEW, Mathwork

MatLab, Microsoft Visual Studio, Altera Quartus II and others, as well as additional CD ROMs in textbooks. An important example of software improves students' understanding of the course. The benefits of OER integrative teaching in the computer-aided classroom are much more valuable than the cost of constructing the classroom.



A University vs. Instructor	B University vs. Student	C Instructor vs. Student
A1 Management A1-1 Student-faculty ratio A1-2 Policy of globalization A1-3 Copyright	B1 Student OER learning B1-1 Encouragement B1-2 (A1-2) Policy of globalization B1-3 Language ability training	C1 Teaching C1-1 Quality of Supplements C1-2 Quantity of Supplements C1-3 Balance of time between teaching C1-4 Enhancement C1-5 Textbooks and additional CD ROMs
A2 Information technology ability A2-1 Hardware A2-2 Software A2-3 Education and Training		C2 Research C2-1 (C1-3) Balance of time between teaching and research C2-2 Communication ability

### C. Instructors vs. students

Textbook selection is an important factor for teaching, and will be crucial in OER aided learning in the future. Associating materials between OER and the textbook will be one of the essential tasks of instructors. While CD-ROMs containing computer aided course materials enclosed in some textbooks may reduce the instructor's effort on coming by the connections of different materials, information from OER summarizes the content of many textbooks. It ameliorates the quality and quantity of the supplements of the course. Because of discrepancies in the topic sequences between selected lecture notes and the translated textbook, association with the contents of lecture notes is important and indispensable to educators and textbook publishers. Nevertheless, the conjunction of the slightly different lecture notes between MIT OCW and the translated textbook reinforce students' learning. Combination of traditional teaching and distance education

Anisetti et al. (2007) developed open virtual laboratories (OVL), and showed that on-line learning students had more time to design, implement, and test their program, which resulted in better learning achievements than in the case of traditional teaching. In our study, instructors e-mailed students the web addresses of the OER introduced in class every week, so students got the ease of reviewing the topics from various types of presentation by surfing through the OER. The statistics of the questionnaire show that students gave positive responses to most OER, and agreed with Anisetti et al.'s study. However, e-learning relies on learners' self-motivation. Furthermore, some teachers indicated that it was hard to supervise classroom conditions in distance education (Tao & Yeh, 2008). A study indicated that classroom energy depends on the teacher's enthusiasm (Metcalf & Game, 2006). In this study, the authors think that listening and questioning makes the learning processes mature. In this point, the computer aided broadcasting classroom combined the two types of learning methods to present advantages in learning.

Because some students may not have the ability to search through the web in English smoothly, it is very important for instructors to give students the correct website addresses of OER. For example, giving the website in the "http://ocw.mit.edu/OcwWeb/Electrical-Engineering-and-Computer-Science/6-003Fall-2003/CourseHome/index.htm" form is absolutely better than just giving the address in "http://ocw.mit.edu/". Although students should immediately write down the website address in their textbook or lecture notes, the e-mail reminder ensures that web addresses are delivered to students.

Data source: MIT OCW

#### **D. Factor analysis**

Using the color plate analysis, our study presents a deeper and clearer decomposition of the factors related to OER aided learning. The color plate is intuitively easy to show the relationships between many factors, and enhances the layout of questions. The factor analysis we proposed has the characteristics of multiple factors combination and hyperlinks for deeper descriptions of the factor.

#### **E. Life-Long Learning**

Justo & DiBiasio (2006) investigated self-directed learning (SDL), and life-long learning (LLL). The study was executed in the Global Studies Program, Worcester Polytechnic Institute. The results showed that raising interesting issues regarding alternative methods of measuring potential benefit is one of the keys to promote SDL/LLL. The governing system of LLL in Asian countries, such as Japan, Korea, Hong Kong, Singapore, Thailand, and the Philippines, was compared in Han's (2001) study. Therefore, OER become a very well aided tool for SDL/LLL, because of the convenience of resource access for instructors and learners. A combination of the traditional classroom and computer-aided OER access overcomes the weakness of self-learning and increases the diversity of LLL. This supports the government to modify the strategy of LLL. The importance of e-learning depends on the areas, resources, information infrastructure, etc. of a given country.

Kärger et al. (2008) developed a learning technology for personalization of online learning which is based on learners' individual goals, preferences, interests, and knowledge, and thus the interaction with the learners can be adapted to their individual needs. The free type of learning is very good for self-learners. LLL is a very wide range of education. Some personalization settings or reading guides for beginners, experienced persons or experts of OER can help self-learners to absorb the knowledge smoothly. The type of learning for regular students might be evaluated because most educators think that common and basic knowledge is the capstone of students' further development. One of the duties for university educators is to push students learning knowledge well.

#### **F. Educational globalization**

Pomales-Carcía et al. (2007) pointed out that an English communication skill is one of the essentials in engineering education. The refined materials of OER help students to get on the content well, and the instructor's explanation and translation of the English vocabulary enhances the student's English communicating ability in Science and Engineering (EST). Therefore, OER in English are a good tool to practice the English language, especially for students with self-discipline in

NNESNs. Lu et al. (2004) and Tung et al. (2011) indicated that 1500 frequent appearance words (FAV) fill almost 90% of the vocabulary of the two textbooks of “Computer Organization and Architecture” in electrical engineering. Therefore, it is possible for anyone who has memorized merely 1500 words to read a technological document in a foreign language, using his work experience and logical thinking. Many scholars claim that people intending to improve their command of a foreign language should read newspapers, which give multitudinous materials for reading. It is natural that one will find the most suitable materials to read and expand to other fields. Therefore, keeping the FAV of foreign language in mind is the key to learning a foreign language.

## **Conclusions**

The enhancement and encouragement of utilizing OER can accelerate students’ knowledge communication and the globalizing pace of universities. The presentations of computer graphics on OER website and software can improve students’ conceptual understanding of professional knowledge. Instructors in NNESNs can improve students’ communication skills in English through the use of OER as well. In the same way, students in NESN are able to understand the knowledge and cultures of NNESNs through OER. This study presented the practice of OER integrated teaching in a computer-aided classroom and students gave positive comments in the questionnaire. This integrative teaching may require some changes from students, instructors, and universities. The association of content between OER and the textbook will be one of the most important activities for instructors. Distribution of correct OER website addresses is very important for students. Free blogs on the web may be another useful tool for instructors; they can easily post course material through processes as simple as using Microsoft Word and do not need to spend time for any settings of the server. The application of the conceptual color plate analysis is good in qualitative and quantitative views of different factors such as application of analysis and introduction of presentation.

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## **A Study of Incorporating Multimedia Technology in PowerPoint on Demand**

### **Abstract**

PowerPoint is a widespread multimedia presentation tool, but using it effectively for e-learning purposes requires a focused approach. This study incorporated the multimedia technology into PowerPoint on demand and explored the relationship between the use of PowerPoint presentation and the maintenance of student interest and motivation in university lectures. The evidence of tests and a questionnaire suggests that PowerPoint is pedagogically effective only by means of diverse presentation and stimulating interest with the use of appropriate multimedia technology in the learning environment. The results provide useful guidance for developing e-learning courseware.

**Key words:** *PowerPoint, multimedia presentation tool, PowerPoint on demand, multimedia technology.*

### **Introduction**

A large quantity of research and knowledge has shown how to use different media for instruction effectively. Due to the limitation of cost and computer literacy, PowerPoint enables an instructional designer to rapidly develop e-learning content. PowerPoint, a user-friendly package, can be used for the creation of visually clear, dynamic and attention capturing presentations (Holzl, 1997). A highly flexible, audience engaging, great visual tool and simple to use are the benefits of using PowerPoint. Images, audio clips, texts and sound effects are used to enrich reports and studies in the presentations and slide shows. Its adoption guides

the speaker to a well-organized path on which the most important points are emphasized (Harknett & Cobane, 1997). Besides, it is easy for a user to combine multimedia with a presentation and even for a novice user to create colorful and easy-to-read slides. Undoubtedly, PowerPoint has some very attractive features as mentioned above, but the real question is whether the use of PowerPoint allows for teaching/learning effectiveness. According to the previous review, some researchers indicated that PowerPoint is promising as far as attractive, exciting, dynamic presentations or even indispensable corporate survival skills are concerned (Szabo & Hastings, 2000; Rankin & Hoaas, 2001; Apperson et al., 2006), but others argued that the format of PowerPoint seems to “take on a life of their own” to the detriment of dialogue, interaction, and thoughtful consideration of ideas (Nunberg, 1999; Sturdy & Gabriel, 2000; Tufte, 2003; Karreman & Strannegard, 2004; Felder & Brent, 2005; Rosen, 2005). Despite the constant controversies, the essential problem of PowerPoint results from poor usage rather than the technology itself. Hence, the purpose of this study is to incorporate the multimedia technologies appropriately into PowerPoint on demand and evaluate the learning effects.

## **Literature Review**

### **PowerPoint for learning**

From a black-and-white application for the Macintosh computer in 1987, PowerPoint has soon developed to one of Microsoft's PC power players today. These days the traditionally used color slides and overheads have been replaced by PowerPoint at some important conferences. At the beginning, PowerPoint was designed for business purposes, but it has quickly penetrated the scientific and educational fields as well. PowerPoint, a user-friendly package, can be used for the creation of visually clear, dynamic and attention capturing presentations (Holzl, 1997). Besides, interactive and persuasive materials can be distributed to learners directly and easily through training departments to help subject-matter-experts share their knowledge everywhere in a globally accepted format. Previous studies have constantly suggested that learners generally believed that the use of PowerPoint helped their learning (Szabo & Hastings, 2000; Rankin & Hoaas, 2001; Apperson et al., 2006). The use of PowerPoint presents a great benefit towards education, namely learners like the courses better, have a more positive impression of the instructor, and therefore, have a more favorable attitude toward their learning (Apperson et al., 2006). However, PowerPoint has its critics. According to the research by Tufte

(2003), Vik (2004), and Doumont (2005), the worst habits by PowerPoint users are as follows (Cooper, 2009):

- cramming too much or too little text per slide,
- backgrounds that are inappropriate and distract from the content,
- implementing too much animation, sound effects, or video,
- lengthy presentations with too many slides
- stuff with complicated graphics or confusing pictures
- lack of presentation structure and content relationships.

Since PowerPoint is everywhere, using it efficiently for learning purposes needs a focused approach. And users need to know what works and what does not work in this rapidly developing environment that PowerPoint encourages.

### **Multimedia technologies in PowerPoint**

PowerPoint is a great visual presentation tool; one of its most powerful features is the fact that it can incorporate multimedia in the presentation. Multimedia is the combination of visual and audio media. Previous studies have pointed out that multimedia presentations, using Microsoft PowerPoint for example, are an effective tool for fostering information retention (Mullett, 2011; Ellis, 2004; Bagui, 1998). Multimedia technologies, such as adding movies and sound, clip art, using animations and scanned images can be easily included at any point in a presentation. While an interactive component should be embedded in multimedia, this interactive component must allow the learner to interact with the material in which he/she can control the outcome of their presentation, thereby necessitating the control of a computer (Tannenbaum et al., 1992). Drave (2000) indicated that the quality of interactivity is more important than content for success in learning (Evan & Gibbons, 2007). Based on the constructivist learning theory, the interactive component can enhance the degree of control, which results in deeper learning outcomes (Smock, 1981; Zimmerman, 1981; Ellis, 2004). Moreover, by adding hyperlinks with slides, the teacher can easily create an interactive presentation that provides a non-linear learning environment for students to interact with the program and make choices. Accordingly, incorporating multimedia technology sparingly into presentations has been shown to achieve beneficial outcomes (Mullett, 2011).

### **Methodology**

This study uses PowerPoint as an experimental medium because PowerPoint is a widely accepted, easily compiled and maintained presentation medium.

Furthermore, previous studies have constantly suggested that learners generally believed that the use of PowerPoint can effectively facilitate their learning (Szabo & Hastings, 2000; Rankin & Hoas, 2001; Apperson et al.,2006).

### **Participants**

The experiment was motivated by the need of 108 university students in southern Taiwan to learn the basic concepts of the computer system. Excluded were unusable surveys which were either incomplete tests or a questionnaire or not followed instructions which were identified and discarded. As a result, 92 respondents (85% of 108 cases) were the basis for data analysis and they were assigned to the experimental group. Of these participants, 49% were males, and 51% were females. Each subject participating in the study was randomly assigned either to the experimental group (n=45) or the control group (n=47). Total workshop duration was 36 hours and lectures were spread over eighteen weeks at a two-hour rate.

### **Instruments**

*Tests and questionnaire* – The research instrument consisted of three tests, one questionnaire and instructional materials. All the items in the instrument were carefully constructed so as to be in line with the purpose of the study. The three tests were: pre-test, post-test and retention test. The post-test that was conducted from the instructional materials was validated by three university instructors (each with ten-year working experience in the related field). There were 20 questions in the post-test and Cronbach's coefficient alpha ( $\alpha$ ) was 0.871. That means the post-test is an appropriate instrument for learning performance measurement. The learning retention test used the same questions as the post-test, but the numbering and the ordering were different to prevent answers from being influenced by repeated exercises.

The questionnaire, the IMMS – overall motivation to learn, was evaluated. Learning motivation is an important factor for inspiring and encouraging learner participation in the learning process. IMMS, developed based on Keller's ARCS model (Keller, 1983) of motivational design, was designed to evaluate how instructional materials affected motivation to learn. In the ARCS motivation model proposed by Keller, there are four constructs including attention, relevance, confidence and satisfaction (Keller, 1983). The constructs describe the motivational procedure: since keeping the student's attention is critical, instructors will provide an interactive and participative environment to attract and maintain learners' attention; learners will feel confident that the course content, activities, and assignments will be related to their personal and professional goals, and that they can achieve the expected

outcomes of the course and satisfaction derived from the instruction (Johnson and Aragon, 2003). IMMS contains 36 7-point Likert scale statements, ranging from extremely dissatisfied (1) to extremely satisfied (7), as well as providing open comments on the system. Each statement measures an individual ARCS component. In order to minimize possible errors caused by students' varying levels of English comprehension, a Chinese version of the questionnaire was used, with the Chinese version of IMMS administered by ESL/EFL and translation experts to prevent any translation mistakes. The reliability of the IMMS, as assessed by Cronbach's alpha for internal consistency, was .872. For the four components (attention, relevance, confidence, and satisfaction) of IMMS, Cronbach's alpha was between .831 ~ .884.

**Materials** – Due to the linear presentation, traditional PowerPoint designers complain about many limits of making presentations. Furthermore, according to the cognitive load theory (Agius and Angelides, 1999; Aggarwal et al., 2001), human working memory capacity is limited, and working memory overload hinders learning. In order to foster learning and transfer, the solution process of a complex task may be divided into small, meaningful building blocks. For those reasons, this research implemented the multimedia technologies which included animation, hyperlink, narration, photo and text in PowerPoint presentations. We designed interactive buttons with the hyperlinks. These interactive buttons contain the content of the whole learning material which is divided into several segments based on the cognitive theory of multimedia learning. By adding hyperlinks a slide-show becomes non-linear and allows the student to interact with the program and make choices. For capturing attention and interest, we added animations to the slide show, e.g., the text appears gradually on each slide (cf. Figure 2). Using animations appropriately in PowerPoint presentations can effectively increase emphasis to a particular point (Mullett, 2011).

Apart from the presentation technologies, we also took the curriculum material into account. Although the essence of instruction is material content, the material still depends on the suitable instructional strategy. Hence, we included an anchored instruction strategy in the curriculum material (Figure 1). Anchored instruction provides a problem-based story environment for students. An "anchor" is often a story, occurrence, or situation that includes a problem or issue to be dealt with that is of interest to the student. All related activities should be designed around an "anchor"; this approach will encourage students to be more actively engaged in learning by situating or anchoring instruction around an interesting topic. Learning environments are designed to allow students to develop effective thinking skills and attitudes that lead to effective problem solving and critical thinking (CTGV,

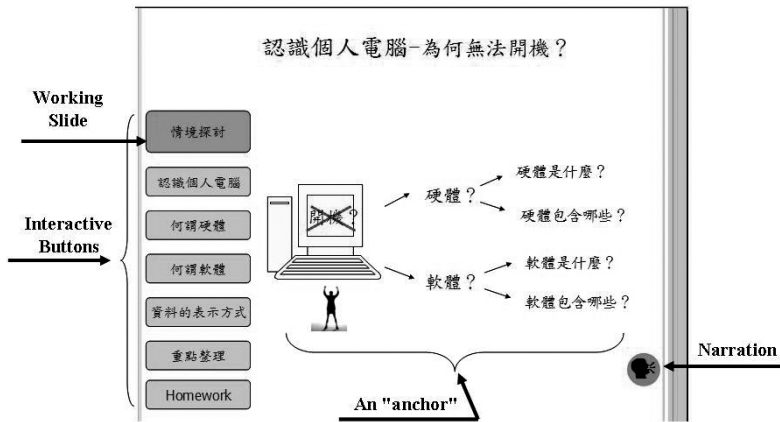


Figure 1. Presentation of multimedia PowerPoint on demand for experimental group

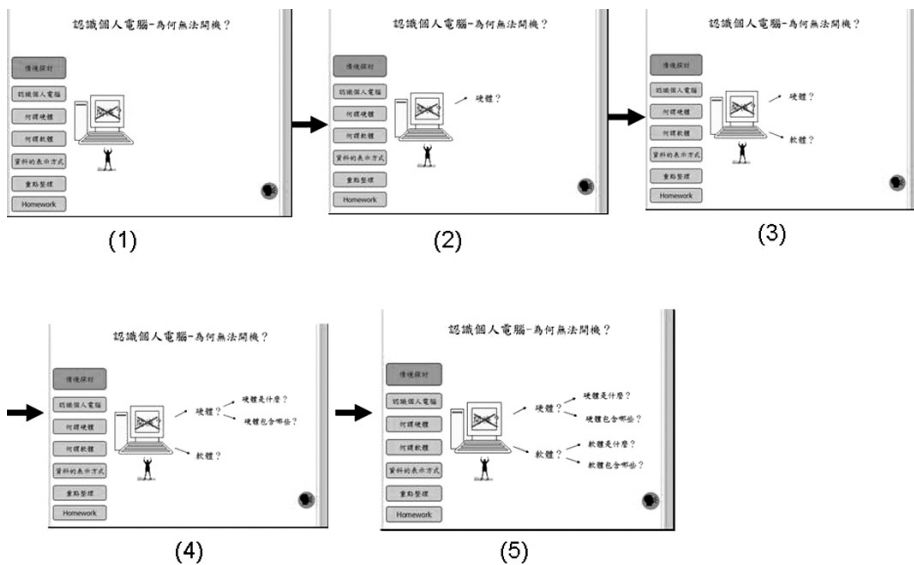


Figure 2. Multimedia PowerPoint on demand presentation with animation (step 1 to 5)

1993). Spoken narration, rather than a text alone, in addition to graphics is also added. Moreover, depending on students' needs, abstract and concrete teaching representations are used alternately and supplemented with diverse information technology materials to enhance the learning outcomes. To check the comprehension for material in the slide presentation, an exercise (Feedback) is provided after each learning unit.

## Method

To exclude the factor of digital divide, in the first week of the classes the participants were required to take a pre-test regarding their experiences of the basic concepts of the computer system and to check the effects of computer literacy and experience on the findings, thereby improving the internal validity of the study. The participants in all the groups went through the same procedure. In the first week, the objective and procedure of the experiment were clearly described. In the study, the experimental group (45 people) was taught with the use of multimedia PowerPoint on demand (cf. Figure 1), whereas the control group (47 people) was taught with the use of traditional PowerPoint (cf. Figure 3). The subjects of these two groups could repeatedly watch the learning materials from the TUT e-learning platform. After the experimental activity, post-test and questionnaires were given to both groups. The testing time was 50 minutes. This implementation was to reveal the students' differences in learning performance. The researcher compiled the post-test based on the students' learning progress and their comprehension of the materials. And three weeks later, a retention test was given to all the participants. The duration of the lecture session and tests was the same for the two groups.

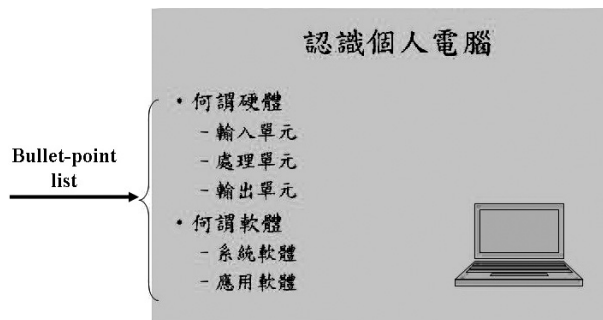


Figure 3. Presentation of traditional PowerPoint for control group

## **Results and Analysis**

After testing and distributing the questionnaires, the researcher gathered the responses and used Statistical Package for the Social Sciences (SPSS) for Windows, Statistical Package for the Social Sciences (SPSS) for Windows, a statistical program, for data analysis. The data collected was coded and entered into a computer by optical scoring, and analyzed using SPSS. Descriptive statistics, including frequencies, means and standard deviations, were reported in order to understand the learners' performance. Average scores of 3.5–5.0 on the 7-point Likert scale were defined as high use; average scores of 2.5–3.4 were defined as medium use; and average scores defined as low use were 1.0–2.4. T-tests were used to determine the effects of the experimental course. The standard for significance in this study was  $p < .05$ . (Su, 2005)

### **Analysis of the pre-test evaluation**

This study used Levene's test to conduct homogeneity of variance. Levene's tests showed that before the experimental session, regarding the pre-test, the average score of the experimental group was 58.81 and the average score of the control group was 60.65. The t value and the significance level ( $t = .580 > p = .564 > .05$ ) showed that the testing results did not reach a significant level. As expected, it meets the prerequisite of this study that both of the groups have substantially similar levels of the initial cognition of experimental curriculum prior to this study.

### **Analysis of the post-test and retention test evaluation**

We used the t-tests to determine the effects of the experimental course. Table 1 shows that after both groups of students received the experimental teaching, the t values and significances levels indicated that the testing results reached the level of significance ( $t\text{-value} = 1.11$ , two-tailed test value = .02), which means that after the experimental activity the participants' learning performance was significantly different. And the mean of the learning performance test of the experimental group was clearly higher than that of the control group ( $81.55 > 76.82$ ). And three weeks later, after the experimental activities, a retention test was given to all the participants. The retention test results also reached the level of significance ( $t\text{-value} = 3.559$ , two-tailed test value = .001), which means that after the experimental activity the participants' retention performance was significantly different. And the mean of the learning retention test of the experimental group was clearly higher than that of the control group ( $76.60 > 62.67$ ).

**Table 1.** Descriptive statistics of learning outcomes (post-test and retention test) in different groups

Test	Exp. (45)		Ctrl (47)		t-value	Sig.
	Mean	SD	Mean	SD		
Post-test	81.55	26.70	76.82	11.50	1.11	.002**
Retention test	76.60	25.08	62.27	9.38	3.559	.001**

\*significant at <.05, \*\*significant at <.01, \*\*\*significant at <.001

**Analysis of the learning motivation evaluation**

Considering all the experimental conditions, there are differences in motivation (ARCS model) among the different conditions: attention: t-value = 2.28 two-tailed test value = .025 < .05, relevance: t-value = 2.18, two-tailed test value = .029 < .05, confidence: t-value = 2.20, two-tailed test value = .031 < .05, satisfaction: t-value = 2.16, two-tailed test value = .030 < .05. Table 2 shows the means and standard deviations of the learning motivation of the participants in different experimental groups, which point out that the motivation of the experimental group is significantly higher than that of the control group.

**Table 2.** Summary of participants' reaction to the experimental activity

Constructs	Exp. group		Ctrl. group		t-value	Sig.
	Mean	SD	Mean	SD		
attention	44.59	12.29	38.55	13.10	2.28	.025*
relevance	44.93	13.55	38.44	14.97	2.18	.029*
confidence	40.89	10.87	35.55	12.38	2.20	.031*
satisfaction	41.67	11.93	36.23	12.23	2.16	.030*

\*significant at <.05, \*\*significant at <.01, \*\*\*significant at <.001

**Discussion and Conclusions**

To date, PowerPoint offers dozens of transitions, but slides do require much design consideration to an effective presentation. This study implemented PowerPoint on demand with multimedia technologies. The findings provide some insights into how to achieve higher learning effectiveness with the presentation of PowerPoint in an e-learning environment. Through the experiment, we found that the interactive buttons with the hyperlink approach to PowerPoint contribute

to the flexibility of a lecture and allows students and teachers to pick and choose the appropriate topics (Matheson et al., 2002). This approach differs from the traditional linear presentation. Besides, adding animation to fade in the bullet points and graphics part by part can attract students' attention, capturing their attention and encouraging them to learn more about the course being promoted. Hence, the results of the tests and questionnaires showed that incorporating the PowerPoint multimedia on demand into the teaching/learning process suggested in this study promotes motivation and learning effectiveness and retention for participants. Furthermore, using PowerPoint turns out to be more effective and cost advantageous and the content can be updated without much effort and in a timely manner to match the training needs (Shah, 2011).

### **Implication and Suggestion**

The findings of this study are encouraging, but we are not in a position to claim that the multimedia PowerPoint on demand is always superior to traditional PowerPoint. It is because there is still room to improve in this study:

1. The effectiveness of e-learning may depend on many elements, including learners' personality, instructors, presentation of media, technology, content and school or company policy.
2. The scope of the study was limited: the success of multimedia PowerPoint on demand may be varied by content and some topics or courses may be better-suited to training than others.
3. A non-random sample of trainees drawn from one university was examined in this experiment and thus the results may reflect a bias.

However, this study does show that, in certain circumstances and limitation of time and expenditure, multimedia PowerPoint on demand can produce better results than other methods. The significant findings of this study can be applied in further research on different types of professional development learning or training. The results have wide implications for school or business training, where on-demand learning, cost, and loss of revenue from travel and instruction often determine the mode and method for learning or training. Thus, there are implications for a variety of education and businesses that are tasked with learners and delivering cost-effective professional development programs.

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## **The Effects of Cooperative Learning Techniques on 5<sup>th</sup> Grade Students' Conflict Resolution and Empathic Tendencies in Science and Technology Course**

### **Abstract**

The main purpose of this study was to investigate the effects of students' teams – achievement divisions, team assisted individualization and traditional instruction on students' conflict resolution and empathic tendencies. 240 5<sup>th</sup> grade students from three different schools participated in the study. To investigate the effect of different teaching approaches on 5<sup>th</sup> grade elementary school students' conflict resolutions and empathic tendencies, conflict resolution (CRS) and empathic tendencies scales (ETS) were applied to the groups as pre – and post-tests. Students who experienced students' teams – achievement divisions and team assisted individualization showed significantly higher mean scores in the dimension of problem solving in post-CRS and for post-ETS and low scores in the dimension of aggression in post-CRS than students who experienced traditional instruction.

*Key words: students' teams and achievement deviations, team assisted individualization, conflict resolution and empathic tendencies.*

### **Introduction**

Communication skills displayed in the learning environment play a crucial role in assisting children to successfully utilize the methods and techniques employed within science education and other fields. Positive communication between the teacher and student and also between students determines the quality of learning products. Two important factors of the above-mentioned positive communication

are empathy, referring to people's mutual understanding of feelings and thoughts of one another, and conflict resolution behaviors, referring to the skills shown in finding solutions to the problems encountered.

In the literature, empathy is defined in different ways, such as the skill of sharing and understanding the emotional situation of others (Cohen and Strayer, 1996); the skill of imagining oneself in the position of others and understanding their emotions (Pink, 2006, 159). Based on these definitions, we can say that empathy is a person's attempt to understand his/her addressee and to make contact with him/her.

It is possible to find studies of empathy in the educational literature although not at a sufficient level. In an experimental study conducted among prospective teachers, Singhal (2000) concluded that the empathic tendency increased their multicultural competencies and reduced their prejudices. Rehber (2007) examined the difference in conflict resolution behaviors of primary education second grade students according to their empathic tendency levels. According to the research results, students with low empathic tendencies have relatively aggressive behaviors and low problem-solving skills. Examining the relationships between the empathic tendency, cooperation and psychological symptoms in university students, Şahin (1997) demonstrated that the empathic tendency and psychological symptoms had an interactive impact on cooperation, especially interpersonal sensitivity, strain, feeling a need for and belief in cooperation.

Conflict occurs when people cannot reach common ground in achieving a goal, solving a problem or at the stage of decision-making (Beebe and Masterson, 2000). Murer (1991) defined conflict as a disagreement resulting from the incompatible wishes of two or more parties. Determining the causes of conflict provides an opportunity for learning and production.

Conflict resolution may be generally defined as the elimination of disagreement between individuals or groups. The values, attitudes and standards of individuals involved in conflict resolution play an important role in resolving conflict. The positivity or negativity of persons' approaches to conflict resolution is among the factors determining the outcomes of conflict resolution (Rehber, 2007). Gordon (2005) identified three forms of conflict resolution behaviors: avoidance, aggression and problem solving. Considering the conflict resolution strategies of 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grade students, Atıcı (2007) demonstrated that the method students applied most frequently while resolving their conflicts was cooperation.

Cooperative learning is a teaching method in which students work in small groups for a common purpose, and receive a reward or approval depending on their performance in the group (Slavin, 1982). According to Johnson and John-

son (1994), cooperative learning includes many strategies making students work together in order to maximize the interaction and positive competition between students, attendance on the lesson, individual responsibilities and working in groups. In the educational literature, there are studies demonstrating that cooperative learning increases students' academic achievement (Bilgili, 2008); improves students' attitudes towards the lesson (Bilgin and Karaduman, 2005); increases memorability (Cihanoğlu, 2008); develops communication and problem-solving skills (Gillies, 2008) and increases self-confidence and social communication (Slavin and Karweit, 1981). No study has been conducted on the effects of cooperative learning techniques on the empathic tendency and conflict resolution. This study examined the effects of two cooperative learning techniques, Student Teams and Achievement Division (STAD) and Team Assisted Individualization (TAI), on the conflict resolution and empathic tendencies of students.

## **General research problem**

Is there a statistically significant difference between averages of the scores that students taking lessons in the classes where Student Teams and Achievement Division technique, Team Assisted Individualization technique and Traditional Teaching approach are applied in teaching of the subjects in the unit "Change of the Matter and Recognition of It" taught in primary education 5<sup>th</sup> grade Science and Technology lesson obtained from Conflict Resolution (Aggressiveness and Problem Solving Dimensions) and Empathic Tendency scales?

## **Method**

### **Subjects**

The subjects of this study were 240 5<sup>th</sup> grade students from three different schools. Three of the classes were chosen randomly and trained with students' teams-achievement division technique (n= 79), three of them team assisted individualization (n=81) and the other three of the classes were chosen randomly and trained with the use of traditional instruction (n= 80) over a nine-week period.

### **Measurement Tools**

**Conflict Resolution Scale (CRS):** This scale was developed by Koruklu (1998). The scale is a 5-point Likert type scale comprising 24 items. There are

two dimensions in the scale: aggressiveness (curse, fight, threat, and attack) and problem-solving. Internal consistency coefficients of the scale were 0.83 for the aggressiveness dimension and 0.83 for the problem-solving dimension. Odd numbers in the scale are about the aggressiveness dimensions, while even numbers are about the problem-solving dimension. A lower average score indicates less aggressive behaviors.

***Empathic Tendency Scale (ETS):*** This scale was developed by Koruklu (1998). The scale is a 5-point Likert type scale comprising 20 items. High scores indicate high empathic tendency, while low scores indicate low empathic tendency. The test-retest reliability coefficient of the data was 0.82.

## **Data Analysis**

The data obtained from the subjects were entered into the SPSS 13 statistical package. The research questions were analyzed via MANOVA.

### **Treatment**

The unit “Change of matter and recognition of IT” offered in primary education 5<sup>th</sup> grade science and technology lessons was taught with the use of Student Teams and Achievement division technique in one of the experimental groups, with the use of Team Assisted Individualization technique in another experimental group and with the use of Traditional Teaching technique in the control group. Treatment stages were as follows: Pre-CRS and pre-ETS were administered to each of the three groups before treatment. Heterogeneous groups were formed in the STAD and TAI experimental groups, according to academic achievement test results and genders. Each student was given a “Team Work Guide”.

Initially, the teacher introduced equipment relating the subject to be taught on this day, summarized the subject and presented it to the students in the STAD group via video. Secondly, the teacher asked the students in the group to read parts from the book related to the subject in order to ensure acquisition of the targeted gains by the students. Then, each group was given adequate worksheets. The worksheets included preparatory questions, reading texts, experiences and different problems so as to understand the subject. The students in the groups initially worked on the worksheets in pairs and reached a consensus with their work-partner; they then worked in larger groups and arrived at a consensus. Thirdly, after the groups completed their work, the teacher randomly selected

a speaker from each group and asked them to explain their results to the whole class. After performing this process with 4–5 groups, the teacher completed the operation without intervening in the answers given by the group spokespersons. When answers given by the groups were complete and correct, the teacher started the next subject. If the teacher identified incomplete and incorrect points, he/she offered correct information about the problems to the whole class by taking into consideration the deficient and incorrect points in the group's explanation.

The teacher clearly stated the goals related to the subject and student acquisition to the students in the Team Assisted Individualization class. The teacher taught the subject or subjects of that week to the students via whole class teaching in two hours. He/she solved examples, asked questions to the students, and answered their questions. The teacher gave one worksheet, consisting of 4 questions, relating to the part he/she had taught to each student. Each student first answered the questions on the worksheet individually, then exchanged their papers with their teammates near them and checked each other's papers. Then, an answer key for the worksheets was given to each pair of students. The students were expected to solve at least one worksheet correctly. After the students finished the worksheet tasks, a tracking test "form A", covering all the acquisitions determined for the week, was delivered to the students. The students completed the test individually and checked each other's test papers. The students obtaining a score of 80% gained the right to take the subject exam, with the approval of their friends, without the need to take a tracking test "form B". The students scoring less than 80% in the tracking test A took the tracking test B and conducted the same operation in this test. In the last hour of the week, the students completed individual exam papers, corresponding to the acquisitions determined for the week. The team success score was based on the individual scores achieved in this exam. The students were evaluated as a team, but not individually. Team success scores were calculated from individual progress scores. The groups were given their awards according to these scores. The researcher observed that in the classes where a traditional teaching technique was applied the teacher taught the subject to the students himself/herself during the lesson. Examples were given when necessary, and then several examples relating to the subject were demanded from the students. When the teacher had finished covering the subject, he/she asked the students several questions about the subject. These questions were answered by a few students who were generally academically successful and volunteered in the classes. The teacher conducted the lesson with a couple of students. Then, they gave homework relating to the subject on the course book. The students were told to read the subject matter if they had time in class. At the end of the class, the teacher asked whether or not the subject was

understood. Points of uncertainty, if any, were covered briefly, and the lesson was finished. Generally, similar operations were conducted in each lesson. At the end of the application, post-CRS and post-ETS were administered to the students in each of the three groups.

## Findings

ANOVA was used to test whether there was a statistically significant mean difference between post-tests and there were no statistically significant mean differences for pre-tests in groups. Pre-CRS (pre-AD and pre-PSD) and pre-ETS results of the students as well as post-test results of these scales are shown in Table 1.

**Table 1:** Scores of Conflict Resolution Scale (CRS) and Empathic Tendency Scale (ETS) for Treatment Groups

Dependent Groups	Variables	n	Mean	Standard Deviation
Student Teams and Achievement Division Technique	Pre-AD	79	30.519	7.021
	Post-AD	79	16.632	6.841
	Pre-PSD	79	44.379	6.612
	Post-PSD	79	53.544	7.171
	Pre-ETS	79	65.012	6.540
	Post-ETS	79	72.113	8.988
Team Assisted Individualization Technique	Pre-AD	81	31.444	6.113
	Post-AD	81	20.654	9.756
	Pre-PSD	81	43.654	7.360
	Post-PSD	81	51.259	8.012
	Pre-ETS	81	64.913	8.096
	Post-ETS	81	71.098	7.827
Traditional Technique	Pre-AD	80	29.862	11.126
	Post-AD	80	25.287	13.161
	Pre-PSD	80	44.750	11.271
	Post-PSD	80	48.212	10.399
	Pre-ETS	80	67.375	9.672
	Post-ETS	80	68.550	8.406

MANOVA analysis was used to test the effect of the various teaching approaches on the students' average post-CRS sub-dimensions (post-AD and post-PSD) and post-ETS scores. Wilks' lambda distribution was used to test the main research question. The results indicate that the applied teaching approaches had a statistically significant effect on the applied dependent ( $\lambda = 0.829$ ;  $F = 10.640$ ;  $df = 3$ ;  $p < 0.05$ ). It

is necessary to look at the results of ANOVA continuing in the MANOVA analysis in order to understand which of the dependent variables show this significant effect; these results are shown in Table 2.

**Table 2:** Results of Variance Analyses (ANOVA)

Source	Dependent Variable	df	Mean Square	F	Sig.	Partial Eta Square
Group	Post-AD	2.237	1491.94	14.169	0.000*	0.107
	Post-PSD	2.237	569.229	7.626	0.001*	0.060
	Post-ETS	2.237	268.674	3.794	0.024*	0.031

N=240, \*p<0,05

As seen in Table 2, there is a statistically significant difference (post-AD, post-PSD) in the dimensions of the conflict resolution scale of the groups and between their average scores in the post-ETS. Comparative group results are given in Tables 3 to 5, respectively, to show the effects of the teaching approaches used in the study on dependent variables.

**Table 3.** Comparing the Mean Scores of Post-AD for Treatment Groups

Dependent Variable	Groups		Mean Difference (I - J)	Sig.
	(I)	(J)		
Post-AD	STAD	TAI	-4.021	0.042*
		TT	-8.655	0.000*
	TAI	TT	-4.633	0.014*

\*p<0,05

As seen in Tables 1 and 3, the average scores of the students in the Student Teams and Achievement Division class, for the aggressiveness dimensions of the post conflict resolution scale, were significantly lower than those of the classes using the Team Assisted Individualization and traditional technique.

**Table 4.** Comparing the Mean Scores of Post-PSD for Treatment Groups

Dependent Variable	Groups		Mean Difference (I - J)	Sig.
	(I)	(J)		
Post-AD	STAD	TAI	1.495	0.776
		TT	5.332	0.000*
	TAI	TT	3.837	0.012*

\*p<0,05

As seen in Tables 1 and 4, the average scores for the problem solving dimension of the post-conflict resolution scale were significantly different in both the STAD and TAI groups compared with the traditional teaching (TT) group. There was no statistically significant difference between average scores in the STAD and TAI classes, for the problem-solving dimension of the post-conflict resolution scale.

**Table 5.** Comparing the Mean Scores of Post-ETS for Treatment Groups

Dependent Variable	Groups		Mean Difference (I - J)	Sig.
	(I)	(J)		
Post-AD	STAD	TAI	1.015	1.000
		TT	3.564	0.024*
	TAI	TT	2.549	0.168

\*p<0,05

As seen in Tables 1 and 5, the average scores of the students in the STAD and TAI classes for the post-empathic tendency scale were significantly different from those of the students in the traditional teaching classes.

According to these results, cooperative learning techniques reduced aggressive behaviors and increased empathic tendencies compared to the traditional teaching technique.

## **Discussion**

According to the study findings, the average post-AD conflict resolution scores were significantly lower in the Student Teams and Achievement Division classes compared to the Team Assisted Individualization classes. Similarly, the average post-AD scores of the students in the Team Assisted Individualization classes were significantly lower than those of the students in the traditional teaching classes. There is very strong evidence suggesting that empathic tendencies are seen more in individuals trying to help others (Eisenberg and Miller, 1987), but are less seen in those displaying aggressive and anti-social behaviors (Miller and Eisenberg, 1988). In the presented study, it was found that the average post-PSD and post-ETS scores of the students in the Student Teams and Achievement Division and the Team Assisted Individualization classes were significantly better than those of the students in the traditional teaching classes. These results confirm the suggestion by Beebe and Masterson (2000) that a cooperative learning environment is an important teaching approach to conflict resolution. And it was also found that the

average post-PSD and post-ETS scores of the students in classes where the Student Teams and Achievement Division technique was applied were significantly better than those of the students in classes where the Team Assisted Individualization technique was applied. One reason for this may be that the students in the STAD classes spent more time together and communicated more with one another compared to the students in the Team Assisted Individualization classes. There is important evidence that conflict resolution training (CRT), which is one of the cooperative learning techniques, improves the class environment (especially for primary schools) and develops students' problem-solving skills (PSK) (Jones and Kmita, 2000). The fact that students help one another, discuss potential solutions to problems and reach a group consensus within cooperative learning environments may indicate that cooperative learning has a positive impact on students' problem solving approaches. It is thought that students are more positive in terms of empathic tendencies within a cooperative learning environment because they work towards a common goal and they are more compatible with their classmates and the environment where they work.

The literature contains many reports on the advantages of cooperative learning methods for empathic tendency and conflict resolution, which are again an indicator and result of the interpersonal communication level. It is thought that this study, focusing on the effects of cooperative learning methods, will contribute to future studies in the field of education. In future research, educational researchers need to design more experimental studies examining the effect of cooperative learning on the empathic tendencies and conflict resolution behaviors of students.

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## **Self-Regulated Learning and Mathematical Problem Solving**

### **Abstract**

The aim of this research is to study high-school pupils' (9<sup>th</sup>–11<sup>th</sup> grades, 14/15 to 17/18 years old) self-regulated learning skills.

The tool of the research is a questionnaire developed for this purpose; the research sample is a group of randomly selected high-school pupils from schools over the north-west part of Romania. The results show that only one third of the respondents think that mathematics is useful in everyday life and their future career; a very low percentage of the pupils set goals for learning mathematics; about a quarter of the respondents analyze correctly the task and have a correct task difficulty perception; the pupils' self-efficacy and self-control is low, but they have a high self-judgement level. Most of the pupils are aware that there is a strong relation between the time they spend with mathematics and their results. There is a strong correlation between the pupils' mathematical results and their interest to study mathematics, their task analysis and self-control skills, and their task difficulty perception.

*Key words: self-regulated learning, self-control, self-judgement, motivation, mathematics education.*

### **Introduction**

Self-regulated learning (SRL) is an academically effective form of learning, through which the learner sets goals and makes plans before starting to learn; monitors and regulates his/her cognition, motivation and behavior during the learning process; and reflects on his/her learning process afterwards (Pintrich,

1995; Pintrich, 2000; Zimmerman, 2001). Self-regulation is very important in mathematical problem solving.

As regards Romanian pupils' self-regulated learning, Marchis and Balogh (2010) conducted research into secondary school pupils (10–15 years old, 5<sup>th</sup>-8<sup>th</sup> grades) studying their interest in mathematics and their self-regulated learning skills as self-efficacy, self-judgement and self-reaction. They have concluded that only a third of the respondents like mathematics, because the others do not see the links between mathematics and their everyday life. Almost half of the pupils have low self-efficacy and more than half of the respondents are worried about their mathematics grades; they have a high level of anxiety, which could be to the detriment of their achievement.

Another study on some aspects of self-regulated learning skills (as task analysis and self-control skills) of secondary school pupils in Romania is presented by Marchis (2010). The results show that secondary school pupils have poor task analysis skills and low self-control.

The aim of this paper is to present the results of research on high-school pupils' (14/15 to 17/18 years old, 9<sup>th</sup>-11<sup>th</sup> grades) self-regulated learning skills.

## **1. Self-regulation and mathematical problem solving**

SRL has three phases: forethought, performance control, and self-reflection.

During the *forethought phase*, from the cognitive point of view the learner analyses the task, activates his/her prior content and metacognitive knowledge, sets goals of the learning process, and plans a strategy to be used. When solving a mathematical problem, the analysis of the task includes the understanding of the problem (reformulating the text with one's own words); identifying given data, relations between these data, and requirements of the problem; recalling prior knowledge related to the problem (definitions; theorems, algorithms, strategies which could be used; similar problems). Motivational goal-orientation, self-efficacy, perception of task difficulty, and activation of the interest to perform the task are important during this phase.

Goal-orientation represents an integrated pattern of beliefs that leads to "different ways of approaching, engaging in, and responding to achievement situations" (Ames 1992, p. 261). A study in the field of goal-orientation reported an important relation between different goals and self-regulation (Tanner & Jones, 2003).

Self-efficacy refers to perceptions about one's capabilities to organize and implement actions in order to reach the desired performance level (Bandura, 1997).

Self-efficacy is students' judgments about their ability to successfully complete a task, as well as students' confidence in their skills to perform the task (Pintrich et al., 1993). "People's beliefs in their efficacy influence the choices they make, their aspirations, how much effort they mobilize in a given endeavour, how long they persevere in the face of difficulties and setbacks, whether their thought patterns are self-hindering or self-aiding, the amount of stress they experience in coping with taxing environmental demands, and their vulnerability to depression." (Bandura, 1991, p. 257) Self-efficacy has a differential influence on response time and efficiency when solving a problem (Hoffman, 2010).

Students' interest in the content area of the task and their beliefs about the utility of the task are also important. In mathematics education students' interest in mathematics, their beliefs in the utility of the mathematical knowledge in their future career or in their everyday life determine in their problem-solving behaviour a fundamental way. "Belief systems are one's mathematical world view, the perspective with which one approaches mathematics and mathematical tasks. One's beliefs about mathematics can determine how one chooses to approach a problem, which techniques will be used or avoided, how long and how hard one will work on it, and so on." (Schoenfeld, 1985, p. 45). The motivation for performing a task influences how students plan the time and effort allocation for solving the task. If students are not motivated to solve a problem, they are most likely to early abandon the problem solving process in the case they do not see positive results.

The *performance control phase* includes self-control and self-monitoring of the cognitive strategies, motivation, and behaviour. While solving mathematics problems "control has to do with the decisions and actions undertaken in analyzing and exploring problem conditions, planning courses of action, selecting and organizing strategies, monitoring actions and progress, checking outcomes and results, evaluating plans and strategies, revising and abandoning unproductive plans and strategies, and reflecting upon all decisions made and actions taken during the course of working on a problem" (Lester, Garofalo & Kroll, 1989, p. 4). A pupil with a high self-control level guides his/her thinking by self-questioning during the problem solving; checks if he/she has used all the data of the problem and if the solution is correct. As reflection on the problem solving process he/she searches for other solutions, thinks about the optimality of a strategy or other; analyzes his/her learning process.

Help-seeking is also an important skill of a self-regulated learner. If a student is stacked with a problem, he/she has to be able to know where to get help. They could search for similarly worked out examples, they could ask for help from their colleagues, teachers or parents.

The *self-reflection phase* includes self-judgment and self-reaction.

Self-judgment is one's evaluation of one's performance and recognition of the relationship between the achieved performance level and the quality of the learning process (Zimmerman, 2000). Thus, self-regulated learners attribute their poor performance to a lack of effort or time; or to the use of an inadequate strategy (Zimmerman, 1998). Students who attribute success to effort and failure to a lack of effort may primarily utilize strategies with which they have experienced success (Borkowski, Weyhing & Turner, 1986). "The more responsibility students can take for their own learning, the more likely they are to attribute success to their own efforts. If students believe that their efforts will make a difference in what and how much they learn, then they are more likely to expend higher levels of effort in their studies" (Hagen & Weinstein, 1995, p. 53).

Self-reaction involves feelings about the obtained results: satisfaction or dissatisfaction (Zimmerman, 2002). When students feel satisfaction about their performance, they are more motivated to complete the task (Schunk, 1991). As mathematics is a difficult subject for many students, the feeling of satisfaction is important to motivate students for learning mathematics. As the mathematics skills of students in the classroom are different, to assure satisfaction each pupil should get tasks appropriate to their performance level.

As regards mathematical problem solving, Pólya (1945) identified four main stages: understanding the problem, making a plan, carrying out the plan, and reviewing the solution. Similar steps are described by other researchers (among others, Higgins, 1997; Leader & Middleton, 2004; Ridlon, 2004). Comparing the phases of self-regulated learning with the main stages of mathematical problem solving, we could observe that these are strongly related.

## **2. The research**

### **Research design**

The aim of the research was to study high-school pupils' (9<sup>th</sup>–11<sup>th</sup> grades, 14/15 to 17/18 years old) self-regulated learning skills.

The tool was a questionnaire with 24 items: 3 demographical questions (sex, grade and mathematics marks of the respondents) and 21 items related to self-regulated learning. These 21 items were measured on a 5 point Likert scale from 1 – not typical of me at all to 5 – totally describes me. These items were developed based on the literature on self-regulated learning of mathematics. Cronbach's alpha reliability for the questionnaire was .83.

The questionnaire was completed in the second semester of the school year 2009/2010.

The sample were 335 randomly selected high-school pupils (9<sup>th</sup>-11<sup>th</sup> grades, 14/15 to 17/18 years old) from the north-west part of Romania (Transilvania), approximately half of them boys (169 pupils) and half of them girls (166 pupils). Almost half of the respondents were in the 9<sup>th</sup> grade (47%), the others were equally distributed between grade 10 and 11 (26%, 27% respectively – cf. Figure 1). The pupils' mathematics results are presented in Figure 2. The marks in Romania are from 1 to 10, 10 being the best mark; marks below 5 are not passing. We asked the pupils to give their average for the first semester of the school year 2009/2010.

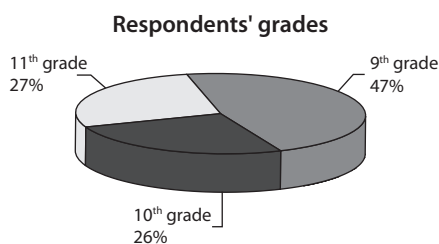


Figure 1. Respondents distribution by grade

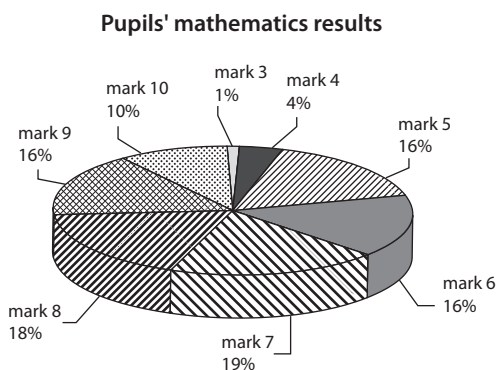


Figure 2. Respondents' mathematics results

## Results

The items related to self-regulated learning skills are grouped according to the phases of self-regulated learning: forethought phase (Table 1), performance control phase (Table 2), and self-reflection phase (Table 3).

**Table 1.** Pupils' responses related to the forethought phase  
(from 1 – not typical of me at all to 5 – totally describes me)

	Items	1(%)	2(%)	3(%)	4(%)	5(%)
Interest	Mathematics is useful in our everyday life.	9.25	25.67	28.06	19.70	17.31
	Mathematics will be useful in my future.	13.13	20.60	24.78	20.30	21.19
Setting goals	When I start to prepare my mathematics homework, I set goals.	67.16	22.99	6.27	2.39	1.94
	I set goals for learning mathematics at the beginning of the semester.	39.40	29.25	17.31	8.66	5.37
Task analysis	I reformulate the problem in my own words.	30.45	24.18	22.69	12.24	10.45
	When I solve a problem, I write down the given data.	11.94	25.37	35.22	16.72	10.75
Perception of task difficulty	After reading the text of a problem I know if I can solve it or not.	7.76	24.18	40.90	14.33	12.84
	If I can't solve a problem, I know what my difficulty is.	11.64	28.96	36.11	13.13	10.15
Self-efficacy	If I have difficulties in mathematics, I can explain what I don't understand.	10.45	23.28	30.15	18.81	17.31
	After I solve a problem, I know if I've solved it correctly or not.	16.11	36.11	32.24	9.25	6.27

**Table 2.** Pupils' responses related to the performance control phase  
(from 1 – not typical of me at all to 5 – totally describes me)

	Items	1(%)	2(%)	3(%)	4(%)	5(%)
Help-seeking	If I can't solve a problem, I search for similarly worked examples.	17.61	20.30	29.56	16.71	15.82
	If I can't solve a problem, I ask for help from a friend.	11.94	26.57	33.73	14.93	12.84
	If I can't solve a problem, I ask for help from my teacher.	28.66	34.93	22.09	7.76	6.57

	Items	1(%)	2(%)	3(%)	4(%)	5(%)
Self-control	While solving a problem I ask questions which help to concentrate on the problem.	32.24	31.34	20.00	8.96	7.46
	After I've solved a problem I check if the result is correct.	21.49	24.78	29.25	11.34	13.13
	While solving a problem I check if I've used all the data.	14.93	32.54	31.04	14.03	7.46
	After I've solved a problem, I ask if I have learnt something new.	51.34	31.94	12.24	1.79	2.69
	After I've solved a problem, I search for other solutions.	39.40	34.33	17.01	5.07	4.18

**Table 3.** Pupils' responses related to the self-reflection phase (from 1 – not typical of me at all to 5 – totally describes me)

	Items	1(%)	2(%)	3(%)	4(%)	5(%)
Self-judgement	If I had more time for practice, I would be better at mathematics.	4.78	11.04	24.18	19.40	40.60
	No matter how much time I devote to studying mathematics, I can't improve my grades.	52.54	25.67	9.85	5.37	6.57

In Table 4, the correlations between the pupils' mathematics results and some of the self-regulated learning skills are presented.

**Table 4.** Correlation coefficients between pupils' mathematics results and some of the self-regulated learning skills

	Mathematics results
Mathematics is useful in our everyday life.	.23
Mathematics will be useful in my future.	.30
When I solve a problem, I write down the given data.	.32
After reading the text of a problem I know if I can solve it or not.	.29
If I have difficulties in mathematics, I can explain what I don't understand.	.33
After I've solved a problem, I know if I've solved in correctly or not.	.35
After I've solved a problem I check if the result is correct.	.27
While solving a problem I check if I've used all the data.	.29

To see if there is a correlation between the pupils' self-efficacy perception and their help-seeking abilities, we calculated, in the case of each pupil, the means of the pupils' responses, the pupils' self-efficacy perception and their interest in mathematics, we also calculated the means of items related to motivation for learning mathematics. The correlation coefficients in the case of these means are shown in Table 5.

**Table 5.** Correlation coefficient between pupils' self-efficacy and their interest in mathematics and their help-seeking ability

	Help-seeking ability
Self-efficacy	.16
Interest in mathematics	.29

## **Discussion**

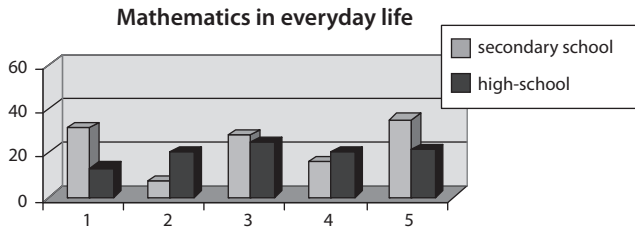
To analyze the results we included the percentage of those selecting the choices "not typical of me at all" and "a bit typical of me" in one group "not typical of me". Thus, because we considered that those choosing "a bit typical of me" rarely act as described in the item concerned. Also, we put the answers "very typical of me" and "totally describes me" in one group "typical of me". Analysis of the responses is made based on these two groups.

Let us analyze the responses grouped according to the phases of the self-regulated learning.

In the forethought phase, what is the most important is to analyze the task, to activate pupils' interest in solving the task, to set goals, and to have correct self-efficacy perception.

If pupils are interested in studying mathematics they are more likely to activate their motivation to solve mathematical problems. They are motivated to learn mathematics if they think that mathematics is useful in their everyday life and/or in their future career. 37.01% of the pupils strongly agree that mathematics is useful in everyday life, 41.49% consider that mathematics is useful for their future career. A third of the pupils consider that mathematics is not useful in everyday life (34.92%) and in their future career (33.73%). The results show that there is a strong correlation between the pupils' beliefs about the utility of mathematics and their mathematics results (Table 4). Comparing the results with those of a survey conducted among secondary school pupils (Marchis & Balogh, 2010) it

is possible to observe that more secondary school pupils have chosen the two extremes “not typical of me at all” and “totally describes me” than high-school pupils (Figure 3). In Romania national tests promote problems which are mathematically formulated and do not have connections with everyday life; to solve these problems pupils need to apply their knowledge of formulas or algorithms (Marchis, 2009). Pupils encounter mathematical problems in their everyday life, but they do not know how to apply their mathematical knowledge to solving these challenging problems. Another aspect to be taken into account is pupils’ success in problem solving. If there is a considerably high probability of success in solving a task, students find the task more enjoyable (Dickinson & Butt, 1989). As pupils have different levels of mathematical skills, assigned problems should be differentiated, taking into account each student’s skills and knowledge. In this way pupils will experience success and develop their skills more efficiently. Yet, in reality teachers rarely take pupils’ skills into consideration when assigning tasks.



**Figure 3.** Pupils’ responses for the item ”There are links between mathematics and everyday life.” (secondary school questionnaire) ”Mathematics is useful in our everyday life.” (high-school questionnaire) (from 1 – not typical of me at all to 5 – totally describes me)

The pupils’ goal-orientation is very low (Table 1). Only 14.03% of the pupils said that it is very/totally typical of them to set goals at the beginning of the semester. A very low percentage, 4.33% of the respondents, set goals before starting to prepare their homework for mathematics lessons.

An adequate analysis of the task and a correct task difficulty perception is essential when solving mathematical problems. Mathematical task analysis includes many aspects, we have chosen only two for this survey: reformulating the text of the problem (essential for understanding the problem) and writing down the data given in the problem. 30.45% of the participants responded that it is not typical of them at all to reformulate the problem in their own words, for 24.18% it is just a bit typical. These results are coherent with those obtained by Marchis (2010) in the case of Romanian secondary school pupils (for 32% it is not typical, for 28%

it is a bit typical). For 11.94% of the pupils it is not typical at all to write down the given data of a problem, for 25.37% it is just a bit typical. These results show that pupils do not know how to understand the text of a problem. This is one of the reasons why Romanian pupils have low averages in international tests on solving real life mathematical problems, as research has shown that there is a strong correlation between task analysis and pupils' mathematical results (Table 4). Only a third of the pupils have a correct task difficulty perception (27.17% know if they can solve a problem after reading the text; 23.28% know what their difficulties are if they cannot solve a problem). A correct task difficulty perception is also in strong correlation with pupils' mathematics achievement (Table 4).

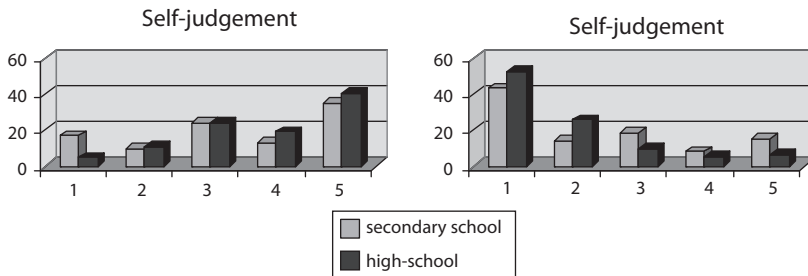
The pupils' self-efficacy is low. In this research we aimed to find more profound results, not only to see if they consider themselves good mathematicians or not. If someone believes in his/her mathematical skills, he/she is able to evaluate their work more efficiently. Thus, the questions related to this skill is about explaining their difficulties in the case of unsuccessful problem solving and evaluating the correctness of a solution. 33.73 % of the pupils cannot explain what difficulties they have when they cannot solve a problem, 52.22% of the respondents cannot evaluate their work. The pupils' self-efficacy is strongly correlated with their mathematical results (Table 4). This result is coherent with those of Wolf and Smith (1995) and Malpass, O'Neil and Hocevar (1999), who showed that self-efficacy has a high positive correlation with test performance outcomes.

As regards the performance control phase, the pupils' help-seeking abilities are poor and they have low self-control (Table 2). When they cannot solve a problem, most of the pupils search for similarly worked problems (32.53%) or ask a friend for help (27.77%). A lower percentage of the respondents ask their teachers for help (14.33%). These percentages are very low. This could have more reasons. As there is a mild correlation between the pupils' self-efficacy perception and their help-seeking abilities, we suppose that if a pupil has a lower self-efficacy perception, he/she thinks that it is useless to seek help, as he/she will never understand the problem. As there is a strong correlation between the pupils' interest in mathematics and their help-seeking behaviour (Table 5), another reason for low help-seeking willingness could be a lack of interest in mathematics: pupils who are not interested in mathematics are unlikely to ask for help in the case of unsuccessful problem solving. A third reason which should be investigated is related to teachers' attitudes to pupils' questions. Pupils might be discouraged from asking questions by the teacher's responses.

Pupils' self-control skills are very limited (Table 2). 83.28% of the respondents do not think about what they have learnt while solving a problem; 73.73% do not

search for other solutions; 63.58% do not guide their problem solving by self-questioning; 47.47% do not check if they have used all the data; 46.27% do not check if their solution them is correct. Some of these problem solving actions were tested for secondary school pupils as well (Marchis, 2010), and the results are similar: 54% do not check if they have used all the data and 68% do not guide their problem solving by self-questioning. The pupils' self-control skills are strongly correlated with their mathematics marks (Table 4).

As regards the last phase of self-regulated learning, the pupils' self-judgement is high (Table 3). Only 15.82% of the pupils think that there is no correlation between the time spent solving a mathematical problem and their mathematical results. Figure 4 presents a comparison between secondary and high-school pupils' self-judgement (comparing the results obtained in this research with those of Marchis and Balogh (2010)). It is clear that high-school pupils have a slightly better self-judgement ability.



**Figure 4.** Comparing secondary and high-school pupils' self-judgement Left: Responses to the statement "If I had more time for practice, I would be better at mathematics."

Right: Responses to the statement "No matter how much time I devote to studying mathematics, I can't improve my grades." (from 1 – not typical of me at all to 5 – totally describes me)

## Conclusions, limitation and future implications

The results of this research show that only a third of the respondents think that mathematics is useful in everyday life and their future career; a very low percentage of the pupils set goals for learning mathematics; about a quarter of the respondents analyze tasks correctly and have a correct task difficulty perception; the pupils' self-efficacy and self-control is low, but they have a high self-judgement level. It can also be concluded that the pupils' mathematical results are strongly correlated

with their interest in studying mathematics, their task analysis and self-control skills, and their task difficulty perception. There is also a correlation between the pupils' help seeking behaviour and their mathematics self-efficacy.

A limitation of the research is the sample size. The research could be extended by evaluating both pupils' self-regulated learning and mathematical problem solving skills, searching for correlations.

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## WebQuest Based Learning: the Attitudes of Primary Students towards Mathematics

### Abstract

This study aimed to determine the attitudes of primary school students towards mathematics in WebQuest based learning (WBL). A descriptive research model was used to determine the attitudes of primary school students towards mathematics in WBL. The participants of this research comprised 92 students (32 in the 6<sup>th</sup> grade, 33 in the 7<sup>th</sup> grade and 27 in the 8<sup>th</sup> grade), who took a WBL Course in Balıkesir run by the researcher. A questionnaire developed by the researcher was given before and after the course in the 2009–2010 fall semesters. The significance of the differences in the attitudes of the primary school students before and after the WBL courses were measured by t test and the students' test scores were found statistically significant at the level of  $p=0.05$ . At the end of the course, the attitudes of the primary school students towards mathematics developed in a positive way in all the classes.

**Key words:** *WebQuest, mathematics education, attitude, t-test.*

### 1. Introduction

WebQuest based learning (WBL) was developed by Bernie Dodge in 1995. The whole or a large part of information is acquired by Internet sources in WBL. WBL is a teaching model including research based activities and enabling learners to be in interaction (Dodge, 1997). This model is based on the constructivist approach. WBL is prepared by the teacher. Besides, it includes pages which indicate the sources that will be examined by learners via the Internet. WBL is composed of

activities about daily life problems and their solutions. This model enables students to work in a cooperative manner. Also, this inquiry-oriented teaching method enables students to make discrimination of information, to develop problem-solving methods on their own and to use Internet sources interactively (Soh-Leong and Hernandez, 2007). Thanks to these characteristics, WBL is an ideal way of implementation of social constructivism in education (Simina, 2005).

Halat defined WebQuest as “a kind of computer-based learning and teaching model”. [4]. In this model, the student actively participates in learning experiences (activities, etc.) and the Internet is used as a library. Asker (2010) described WebQuest as “a web page prepared for educational aims”. Dodge mentions two types of WebQuest (Dodge, 1997). In the short term, the aim of WebQuest is to acquire and integrate information. In the long term, the aim of WebQuest is to increase the information as reaching it and simplify the information. WebQuests include activities requiring individual and cooperative study of students on the Internet. There are some steps needed for students to follow while implementing the activities.

WebQuest is prepared in such a way that it gives students daily life-like tasks (known as true or real). Through WebQuest, students focus on information instead of looking for information. Tasks given in the WebQuest are prepared to support students’ thinking, analyzing, synthesising and evaluating levels (Asker, 2010; Kurtuluş et al, 2005; Kurtuluş et al, 2006). WebQuests differ in some aspects



Figure 1. WebQuest Homepage

from web pages which are known for features such as configuration, content and presentation. The parts and the features related to these parts can be listed as [Dodge, 1997; Halat, 2005; Asker, 2010; Kurtuluş et al, 2005; Kurtuluş et al, 2006; Dodge, 2001; Kelly, 2000; Yoder, 1999; Halat, 2007 and Halat, 2008):

*Introduction:* In this part, the aim is to make a general explanation and give the necessary pre-information about the lesson. In this section, the lesson and the activities that will be accomplished by students in the lesson are briefly introduced. Information about the activity is given. Because the introduction part is prepared in order to motivate students, its most important characteristic is interesting presentation of the exercises or activities to students in a text or story. Students should be informed if a role or scenario is suitable for them in the activities.

*Task:* In this part, it is briefly and clearly indicated what the necessary activities are. In this part, students face an interesting task that they will be able to finish within the given time. The most remarkable feature of this part is that given tasks should be meaningful, achievable, interesting and enjoyable for children. These tasks can be a problem or a mystery requiring solution, a situation requiring clarification or defence, a product that will be designed, a complicated situation that will be analyzed, statement of a personal idea about a situation, a summary that should be composed, an article or persuasion message that has an artistic value, creative work or all kinds of work that students are required to process and convert. If the

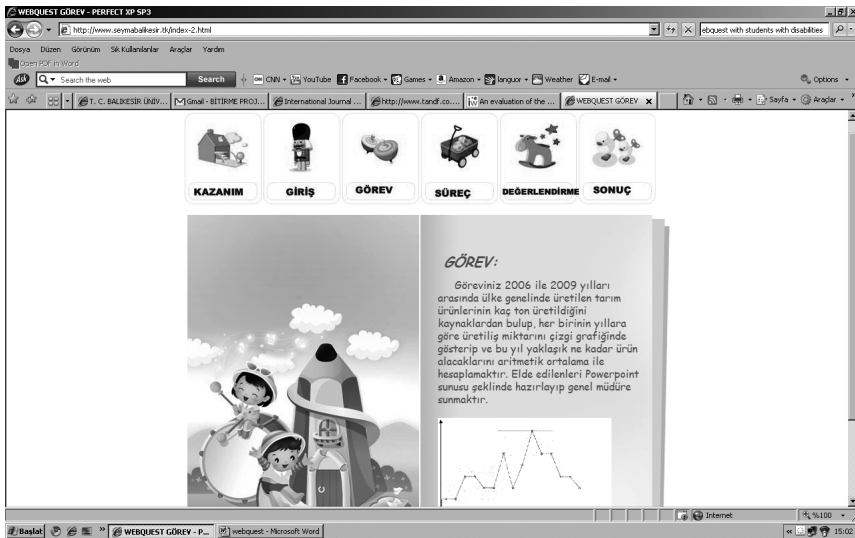


Figure 2. WebQuest Task Page

last product asked from students requires a tool (web, word processor, video, etc.), it should also be mentioned here.

*Process:* This is a part in which steps required for performing the task are clearly identified to students. It is explained how given information or directions should be followed to achieve the goal. Clear identification of this part enhances the functionality of WebQuest. Because the steps in this part address students, it is appropriate to use second person pronouns. Using a clear language is necessary, as students should understand given steps. Steps/levels can be multiplied for student success. Students can compose this level under the guidance of the teacher. In this part, guiding students about accessed information makes their work easier. This guidance can be suggestions about using organizers, like flow charts, summary tables, concept maps, etc. Moreover, this guidance should be questions, a checklist to students for helping to analyze the data or attention and thinking about things. If some extra information and skills (such as how to conduct brainstorming or how to interview a specialist) are necessary for students to accomplish this lesson, prepared and specified supplementary documents should be added here.

*Sources:* Sources consist of Internet links formerly chosen by the teacher. Computer skill levels depend on students, students have opportunities for searching related sites and saving information presented in the organizer. Organizing sources can take too much time; thus, the teacher can exclude the sites that might be difficult in terms of information and readability. Thus, students will not worry about writing a useless URL address in the Web site; they will just click on Hypertext links in the sources page. This information could be given within the process.

*Evaluation:* In this part, it is explained to students how their work could be evaluated. It is indicated whether their work will be evaluated within the group or individually. In this step, a rubric encompasses the whole process and it indicates how the process will be evaluated in terms of some criteria (Faichney, 2002).

*Conclusion:* It includes an activity in which learning goals have been summarized and learning subjects could be generalized. In this step, students are able to share their outcomes with other students (Faichney, 2002).

Besides these features, WebQuest should have three more basic features. March (March, 2000) classified these features as follows: the first one is being realistic about WebQuest. So many students are interested whether a case study or problem is real or not. The second one is its rich content and the third one is WebQuest being attractive to draw students' attention.

In the Turkish primary school mathematics curriculum, updated in 2004, one of the main objectives of teaching mathematics is to increase the mathematics ability of students. It is predicted that students' understanding and making sense

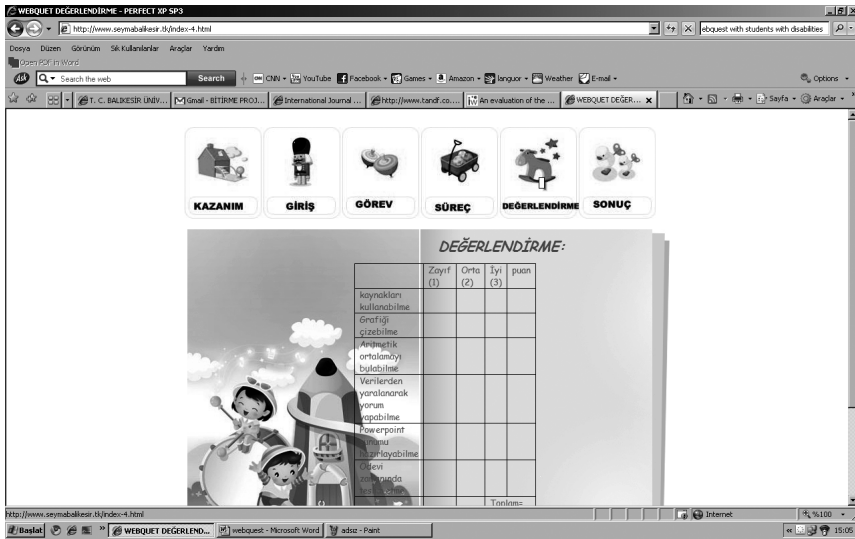


Figure 3. WebQuest Evaluation Page

of internal relationships, features and proofs of mathematics is increased by using their mathematical knowledge. Students able to use maths are supposed to shift their learning to new situations and solutions of daily problems (Baki, 2006). Also, this new curriculum aims at enabling students to master problem solving, communicating, implication and relating skills.

WebQuest is a method students learn by themselves and it is fun rather than boring mathematics and geometry lectures used in teaching mathematics. At the same time, it works as an attractive, enjoyable, guiding and student activating model. Therefore, WebQuest can be used as an efficient method for teaching and learning mathematics (Halat, 2007).

Halat and Jakubowski implemented their studies in geometry classes at Florida State University with the participation of 19 middle school and high school mathematics teacher candidates. Geometry subjects, such as triangles, squares, etc., were chosen for every single group and they were asked to prepare a WebQuest for teaching at the 7<sup>th</sup> gradelevel. In the study, the teacher candidates positively reacted to the use of WebQuest, which stresses the necessity for teachers to be supported to use WebQuest (Halat and Jakubowski, 2001).

A study by Ikpeze and Boyd shows that the teaching process with WebQuest improves learners' motivation, cooperation and awareness of different skills, implementing skills of logical relationships between concepts (high level skills) and research skills with the help of surfing on the Internet (Ikpeze and Boyd, 2007).

Kurtuluş and Kılıç examined the effects of WebQuest-based teaching on the achievement levels of 5<sup>th</sup> degree students of mathematics course objectives. In the study conducted with three different groups, one of the groups was instructed with the use of WebQuest, other group was given cooperation-based instruction, and the last group was taught according to new primary school curriculum. Eventually, it was expressed that the achievement levels of the students that received WebQuest-based instruction in mathematics were higher than those of the other two groups and this difference was found meaningful (Kurtulus and Kılıc, 2009).

The most significant reason for using WebQuest in teaching mathematics is the assumption that WebQuest will provide an effective learning environment to educational areas by adapting computers and the Internet. Because the use of the WebQuest technique in teaching appeared in 1995, it is still quite new, so teaching with the use of the model needs to be analyzed. Some research is conducted on the model commonly used in many countries. However, the model may not work in the same way in different countries because of the unique characteristics of different countries' students. Therefore, a necessity of research into the effects of this model on students in our country emerged. After the literature review, because of the limited quantity of research conducted in our country and abroad on the effects of WebQuest on students' academic success and attitudes in mathematics courses, this study is considered as necessary. For this reason, in this study, the following question and sub-questions were examined;

Problem: What are the attitudes of primary school students towards mathematics before and after WBL course?

1. Is there any significant difference in the mathematics attitudes of 6<sup>th</sup> grade primary school students' pre – and post-WBL course?
2. Is there any significant difference in the mathematics attitudes of 7<sup>th</sup> grade primary school students' pre – and post-WBL course?
3. Is there any significant difference in the mathematics attitudes of 8<sup>th</sup> grade primary school students' pre – and post-WBL course?

## **2. Method**

### **2.1. The model of research, study group**

The study group of this descriptive research consisted of 92 students taking a WBL course at a primary school in Balıkesir. 32 students were in the 6<sup>th</sup> grade, 33 were in the 7<sup>th</sup> grade and 27 were in the 8<sup>th</sup> grade.

## **2.2. Development of data collection instrument**

For this study, an attitude scale was developed in order to determine the attitudes of primary school students towards mathematics. First of all, the literature was reviewed to develop the scale. A draft questionnaire was prepared by arranging the attitude sentences created from the pool by taking an expert's view in harmony with Likert type of 5 degrees. The scale, consisting of 32 items, was applied as a pilot study to 162 primary school students in another school in Balıkesir during the 2009–2010 fall semester. The scale was a Likert-type instrument and the answers were classified between “completely agree” and “completely disagree.” In order to provide the construction validity of the scale, factor analysis was applied. The items misunderstood by the primary school students during the pilot application and disapproved by the researchers for the scale were not subjected to factor analyzing. Factor analysis was applied to 30 factors in the scale. After necessary validity and reliability study had been conducted and an expert's views considered, 7 items were excluded from the scale depending on findings. Moreover, Cronbach's alpha reliability coefficient of the scale was found 0.92 and this value demonstrated that the scale was reliable (Büyüköztürk, 2006). The scale finally included 23 items.

## **2.3. Data Collection and Analysis**

The scale was applied to 92 students (32 in the 6<sup>th</sup> grade, 33 in the 7<sup>th</sup> grade and 27 in the 8<sup>th</sup> grade), who took a WBL course in Balıkesir run by the researcher during the 2009–2010 fall-semester. The scale was applied to the students before and after the WBL course with the use of pre – and post-attitude scales. While analyzing the data obtained as a result of applying the scale, SPSS 17.0 package program was used. As a result of the evaluation of the attitude scale with the aim of answering the sub-problems, the significance of difference in the attitudes of primary school students' pre – and post-attitude scales was determined with t-test for independent samples.

## **3. Results**

### **3.1. Findings and interpretations**

The analyses of the data collected from the primary school students were given in two ways as the descriptive statistics and interpretative statistics to find answers to the research problems.

### 3.1.1. Descriptive statistics

In this part of the research, the frequency (f) and percentage (%) values belonging to the variables of the students' grades were presented.

**Table 1.** Frequency and percentage distribution of the students' grades

Students grade	Frequency (f)	Percentage (%)
6 <sup>th</sup>	32	35
7 <sup>th</sup>	33	36
8 <sup>th</sup>	27	29
Total	92	100

The distribution of the grades of the primary school students as shown in Table 1, 32 6<sup>th</sup> grade students, 33 7<sup>th</sup> grade students and 27 8<sup>th</sup> grade students, in total 92 primary school students participated in this research.

### 3.2. Interpretative statistics

The data taken from the primary school students to investigate whether the scores of attitudes towards mathematics changed before and after the WBL course were statistically analyzed.

#### 3.2.1. Findings related to the first sub-problem

In this part, the scores of the primary school students' attitudes towards mathematics were analyzed using t-test for independent samples whether there was a meaningful difference between the primary school students before and after the WBL course.

**Table 2.** Comparison between Pre-Attitude Scores and Post-Attitude Scores of 6th Grade Primary School Students

Group	N	X	S	t	p
Pre-test	32	3.09	.73	-5.08	.000*
Post-test	32	4.03	.73		

\*p<.05

As seen in Table 2, there was a difference between the mean scores taken from the attitude scale in favour of the post-test. T-test for independent samples through the SPSS 17.00 program was used to understand whether the difference was meaningful or not. The value of t was found as - 5.08. From the analysis it was seen that there was a meaningful difference between the mean scores in 95% confidence

interval because the value of  $p$  was .000 and  $p \leq 0.05$ . In other words, there was a meaningful difference between the students' attitudes towards mathematics after the WBL course in the 6<sup>th</sup> grade.

### 3.2.2. Findings related to the second sub-problem

**Table 3.** Comparison between Pre-Attitude Scores and Post-Attitude Scores of 7th Grade Primary School Students

Group	N	$\bar{X}$	S	t	p
Pre-test	33	3.39	.96	-3.43	.001*
Post-test	33	4.12	.73		

\* $p < .05$

As seen in Table 3, there was a difference between the mean scores taken from the attitude scale in favour of the post-test. T-test for independent samples through the SPSS 17.00 program was used to understand whether the difference was meaningful or not. The value of  $t$  was found as  $-3.43$ . From the analysis it was seen that there was a meaningful difference between the mean scores in 95% confidence interval because the value of  $p$  was .001 and  $p \leq 0.05$ . In other words, there was a meaningful difference between the students' attitudes towards mathematics after the WBL course in the 7<sup>th</sup> grade.

### 3.2.3. Findings related to the third sub-problem

**Table 4.** Comparison between Pre-Attitude Scores and Post-Attitude Scores of 8th Grade Primary School Students

Group	N	$\bar{X}$	S	t	p
Pre-test	27	3.62	.88	-3.24	.002*
Post-test	27	4.37	.79		

\* $p < .05$

As seen in Table 4, there was a difference between the mean scores taken from the attitude scale in favour of the post-test. T-test for independent samples through the SPSS 17.00 program was used to understand whether the difference was meaningful or not. The value of  $t$  was found as  $-3.24$ . From the analysis it was seen that there was a meaningful difference between the mean scores in 95% confidence interval because the value of  $p$  was .002 and  $p \leq 0.05$ . In other words, there was

a meaningful difference between the students' attitudes towards mathematics after the WBL course in the 8<sup>th</sup> grade.

#### **4. Conclusion**

Eley and Eley suggested that introducing new teaching and learning techniques for staff and students was one of the main factors stimulating interest in technology at all levels (Eley and Eley, 1995). In addition, the teacher's key goal is to encourage each student to achieve to the best of his/her abilities. The obvious way to accomplish that goal is through the use of new, innovative technology-based strategies. This is where WebQuest can play a role in teaching as a learning tool. WebQuest has the potential to enhance the learning of students if appropriately used. It can encourage more independent and active learning and can be an efficient means of delivering course materials (McKimm, Jollie and Cantillon, 2003).

The study documented that designing WebQuest had a positive influence on the primary school students' motivation towards mathematics. This supports the argument of Schofield who claimed that using technology in teaching and learning had a great effect on students' motivation, attitudes and achievements (Schofield, 1995). As a result, the students who have lessons with WBL develop more positive attitudes towards mathematics than if they took part in a typical class environment comprising of lectures, discussions, and traditional activities. That is because previous research has proved that WBL is at least as effective as the traditional lecture format for teaching (Ezell, 2003; Aoki, 2004; Sankaran, Sankaran and Bui, 2000; Hardy, 1998; Segers and Verhoeven, 2009 and Hassanien, 2006). As a result of this study, the primary school students' attitudes towards mathematics in the WBL course increased.

WebQuest is a format of Web-based learning that teachers may incorporate into their instruction. There are several options for educators who wish to create WebQuests but they do not have experience in creating Web pages. Teachers may enrol in one of these classes to learn how to use a Web publishing editor. The Web is an excellent learning tool that WebQuest may be useful to find ways to develop or enhance students' positive attitudes towards mathematics.

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## **The Effect of Technology Based Course Material Use on the Science Teaching Self-Efficacy Beliefs of Pre-service Elementary Teachers**

### **Abstract**

In this study, “Self-Efficacy Belief Scale in Science Teaching” was used, which was developed by Enochs and Riggs (1990). The study was designed based on experimental design with pretest-posttest control group. The scale was applied to 78 pre-service teachers enrolled at the 3<sup>rd</sup> grade of Niğde University Faculty of Education Department of Elementary Education as a pretest before the implementation and as a posttest after the implementation. It was found that technology based teaching materials were effective on science teaching self-efficacy beliefs of pre-service elementary teachers only as much as the teaching materials designed by teachers.

**Key words:** *Science Teaching, Self-Efficacy Beliefs in Science Teaching, Teaching Material.*

### **Introduction**

The first five years of elementary education are quite important as they prepare students for the courses at the second level of elementary education and provide a background. Therefore, elementary school teachers working in the first five years of elementary education should have enough self-efficacy beliefs which are required to maintain the success and proficiency of students in courses like science-technology, mathematics and social studies; because, teacher self-efficacy beliefs, which were defined by Ashton (1985: 142) as “the beliefs of teachers on their self

capabilities that have positive effects on the learning process of the students” and one of the characteristics of many teachers, are strongly and consistently associated with the achievement of the students. Moreover, it was mentioned that there was a strong relationship structure between teachers’ self-efficacy beliefs perceptions and students’ self-efficacy beliefs perceptions and the achievement and motivation of the students (Tschannen-Moran, Hoy and Hoy, 1998: 222).

Self-efficacy belief is based on Bandura’s “Social Learning Theory”. Bandura (1997: 2) defined self-efficacy as “the beliefs that individuals develop to organize the activities which are required to manage possible situations according to their capabilities of fulfilling these activities”.

Self-efficacy beliefs are formed with four main sources defined as mastery experiences, vicarious experiences, social persuasion and physical/emotional reactions (Bandura, 1982: 126–127; Bandura, 1989: 1179). The most effective of these sources is mastery experiences (Bandura, 1994: 72); because it could be stated that mastery experiences reflect the feature of “first-hand experiencing and these experiences affect individuals’ capabilities directly and permanently” which are in the nature of learning by doing-experiencing.

Self-efficacy belief is mostly related to private areas. Teachers’ self-efficacy, which is one of these private areas, was defined by Guskey and Passaro (1994: 628) as “teachers’ beliefs to have self-confidence in presenting effective teaching-instruction to their students”. The most widely accepted scale in determining teacher self-efficacy is “Teacher Efficacy Scale” which was developed by Gibson and Dembo (1984) and modified by Guskey and Passaro (1994). This scale is composed of two dimensions as general teaching efficacy and teacher self-efficacy (individual teaching efficacy). The belief of teachers’ presenting more qualified and effective instruction to their students or not underlies the basis of teachers’ self-efficacy beliefs.

The teachers and/or pre-service teachers’ self-efficacy beliefs in science teaching is one of the components of teacher self-efficacy as in self-efficacy beliefs in courses like mathematics, social studies, music and art; because Bıkmaz (2002: 199) stated that self-efficacy belief is multi-dimensional and associated with different areas. As teachers’ general self-efficacy beliefs do not reflect their beliefs related to teaching a certain area, it is also important to determine teachers’ self-efficacy in private areas (Yılmaz, Köseoğlu, Gerçek and Soran, 2004).

Self-efficacy belief in science teaching, which is the basis of this study, was defined as the judgments of teachers on their self capabilities on whether they could present effective and efficient science teaching and increase their students’ achievements. Riggs and Enochs (1990) who carried out studies on determining

self-efficacy beliefs of elementary school teachers in science teaching and developed a scale about it also developed a scale for pre-service elementary teachers (Enochs and Riggs, 1990). The self-efficacy beliefs scale in science teaching for elementary elementary teachers is composed of two dimensions. These are personal self-efficacy belief and outcome expectancy.

Outcome expectancy is one's guessing the outcomes of his behaviors approximately. Personal self-efficacy belief is the belief of an individual in whether or not he could exhibit the required behaviors in order to accomplish the desired outcome (Enochs and Riggs, 1990: 6-7; Gibson and Dembo, 1984: 570). While these two main expectations for self-efficacy belief in science teaching are two different structures from each other, they also influence each other; because Bandura (1977: 79) stated that "as individuals with high self-efficacy belief could accomplish the outcomes they desire, their outcome expectancy would be shaped in accordance with this". (Cited in Akbaş and Çelikkaleli, 2006: 100).

In the light of these explanations, it could be stated that the use of technology based or teacher-made teaching materials in order to accomplish effective and efficient science teaching focuses on determining what kind of change occurs in pre-service elementary teachers' self-efficacy beliefs in science teaching; because, when the studies on this issue are examined, no specific study was encountered on how effective the use of teaching materials in science teaching and the general structure of these materials are on the pre-service elementary teachers' self efficacy beliefs in science teaching. Therefore, this study was carried out in order to determine the relationship between self-efficacy in science teaching and the use of materials which are inevitable parts of an effective teaching process.

## **Purpose of the Study**

The purpose of the study was determined as the examination of effects of technology based teaching materials use on the self-efficacy beliefs of pre-service elementary teachers during the instruction process and the problem statement was formed as "Do pre-service elementary teachers' self-efficacy beliefs in science teaching differ significantly according to the teaching material used in the instruction process?"

### **Hypothesis**

According to the posttest scores,

- a) the self-efficacy beliefs in science teaching were higher in the experimental group than those in the control group.

- b) the outcome expectancies in science teaching were higher in the experimental group than those in the control group.

### Research Design

The study was in experimental model. Experimental models are research models in which the data to be observed were produced under the control of the researcher in order to determine the cause and effect relationship (Karasar, 2000: 87). During the study, “design with pretest-posttest control group” which was one of the experimental models, was used. The figurative view of the study was summarized in Table 1.

**Table 1.** The Figurative View Related to the Experimental Design of the Study

Groups	Pretest	Process	Posttest
Exp. Group	SSEBST	Technology supported the use of teaching materials	SSEBST
Control Group	SSEBST	The teacher made use of teaching materials	SSEBST

### Study Groups

The study was carried out at Niğde University Faculty of Education Elementary Teaching undergraduate program in the Spring term of 2009–2010 academic year. There were 2 sections of 3<sup>rd</sup> year students in this program. The reason for choosing 3<sup>rd</sup> year students as participants was that students took a science and technology teaching course in the 3<sup>rd</sup> year of four-year teaching program.

SSEBST was applied to both sections before the experiment in order to determine whether the groups which were assigned as control and experimental groups were equal or not; the data was analyzed by means of independent t-test and the findings were presented in Table 2.

**Table 2.** The t-test Results Related to the Pretest Scores of SSEBST and SAT of the Experimental and Control Groups before the Implementation

Scale	Scale Dimensions	Groups	N	$\bar{X}$	S	t	df	p
SSEBST	Self-Efficacy Belief	Exp.	40	37.18	4.26	1.36	76	.178 p > 0.05
		Control	38	38.37	3.42			
SSEBST	Output Expectancy	Exp.	40	18.73	2.98	1.091	76	.279 p > 0.05
		Control	38	19.37	2.14			

As presented in Table 2, there was no significant difference between the groups in terms of the sub-dimension of SSEBST self-efficacy belief ( $t_{(76)} = 1.36, p > 0.05$ )

and the sub-dimension of output expectancy ( $t_{(76)} = 1.091$ ,  $p > 0.05$ ). This finding indicated that there were similarities between the students of both groups in terms of science teaching self-efficacy beliefs. Moreover, the fact that the number of students in groups and their education period were equal was taken into consideration in equalization processes. One of the equal sections was randomly assigned as experimental group and the other one was assigned as control group.

### **Data Collection Tools and Procedure**

In the study the “Scale for Self-Efficacy Belief in Science Teaching” (SSEBST), determining the pre-service teachers’ self-efficacy beliefs in science teaching, was used. The permissions for the use of measurement tools in the study were obtained through e-mail from the researchers who conducted reliability and validity tests.

After managing the equalization between groups, pretest was implemented to the study groups and a four-week instruction period started in both groups. After the instruction process, posttest was implemented.

The topic to be taught in the instruction process was determined as “Earth, Sun and Moon” unit which took place in the curriculum of Turkish National Education System Primary School fifth year science and technology course. In order to complete the whole unit in time, the topics of the unit were divided into four parts. These parts were “the shapes and the size of the Earth, Sun and Moon” for the first week, “the movements of the Earth” for the second week, “the movements of the Moon” for the third week and “the phases of the Moon” for the fourth week. The instruction of each topic was accomplished within four course hours a week. A course hour was composed of 40 minutes and the time allocated for the units was arranged as 160 minutes.

In the experimental group, 40 students were divided into four groups of ten students. The groups were numbered from one to four; and each of the four topics was randomly assigned to a student group. The researcher organized informative meetings with the group members before the instruction process. The topics of these informative meetings can be listed as course duration, the framework of the topics within primary school 5<sup>th</sup> year science and technology curriculum, the student gains mentioned in the program, the need for the materials, which caused the background knowledge into process in the introduction part, which helped to structure the knowledge in the development part and which were used for the evaluation in the conclusion part, to be technology based, and finally, how technological infrastructure can be used in developing related materials.

As for the control group, 38 students were divided into four groups numbered from one to four and the topics were randomly assigned to the groups. The 1<sup>st</sup>

and the 2<sup>nd</sup> control sub-groups were composed of 10 students and the 3<sup>rd</sup> and the 4<sup>th</sup> control sub-groups were composed of 9 students. The researcher organized informative meetings with the control sub-groups on the aforementioned topics before the implementation. The difference in the information presented was that the materials to be used in the introduction, development and conclusion parts should be prepared in traditional ways. The traditional materials, which were also called “Teacher-made”, based on pen and paper and stationery. The pre-service teachers in the control group were informed on how to prepare traditional materials, the preparation principles and their features.

The pre-service teachers in the experimental group created the required materials for the first and the fourth topics using photoshop-real draw-powerpoint software programs and for the second and the third topics using photoshop-real draw-flash software programs. The visualization of the materials was managed using software programs for cutting and shaping pictures (photoshop-real draw) and the movements of the visuals, the placement of the short descriptive texts, color selection and the sounds on the visuals were managed using powerpoint-flash software programs.

The pre-service teachers in the control group prepared two dimensional materials composed of visuals and texts using stationery and pictures and three dimensional materials like models using easily-accessed and simple materials (for example, table tennis ball, soccer ball, play dough, thin wires, etc.).

The final remark about the instruction process of the study is that the whole course with its material design and development processes were planned and carried out by the pre-service teachers under the guidance of the researcher. Thus, it was aimed at making the pre-service teachers gain first-hand experience (mastery experience) in the instruction processes.

## **Findings Related to the Scale’s Validity and Reliability**

### **The Scale for Self-Efficacy Belief in Science Teaching**

SSEBST was developed as 23 items and 2 dimensions in total by Enochs and Riggs (1990); and it was adapted into Turkish and its validity and reliability tests were conducted by Bıkmaz (2002). Later, the researchers applied SSEBST to the 98 pre-service teachers who did not participate in the study and factor analysis was conducted for the validity and reliability tests.

KMO test result of SSEBST was found to be .77; Barlett test of Sphericity was found to be significant ( $p < 0.01$ ), and the factor analysis of the scale was conducted.

In factor analysis, the lower limit for each item was as .40 and the items below this value or not listed under any factor were omitted from the scale; and finally the number of items in the scale was decreased to 16. The common factor variance values of the scale were found to be between 0.21 and 0.62. Following this step, factor load values were calculated through varimax rotation technique and it was determined that the scale was composed of 2 dimensions. The first factor (self-efficacy belief) was composed of 11 items and it explains 24.29% of the total variance of the scale. The second factor (output expectancy) was composed of 5 items and it explains 16.42% of the total variance of the scale. All the factors explain 40.71% of the total variance of the scale. The factor loads for the 16 items in the scale ranged from 0.45 to 0.79.

As for the reliability of the scale, Cronbach's alpha coefficient was calculated and this coefficient was found to be .79 for the whole scale, .81 for the first sub-dimension and .72 for the second sub-dimension. Finally, it could be stated that SSEBST could measure the self-efficacy belief of pre-service elementary teachers in science teaching within the determined factor structure consistently and reliably.

### Data Analysis

The data of the study was recorded by means of SPSS 15.0 software package program and the statistical analysis was conducted. In these analyses, independent *t*-test was used in the examining of the main problem and hypothesis.

## Findings

### Findings Related to the Main Problem

The statistical situation obtained at the end of the data analysis related to the main problem of the study was presented in Table 3.

**Table 3.** The *t*-test Results for the Difference between the SSEBST Scores (Posttest) of Control and Experimental Groups

Scale	Groups	N	$\bar{X}$	S	t	df	p
SSEBST	Exp.	40	62.38	6.97	0.505	76	.615 p > 0,05
	Control	38	63.08	5.15			

According to these findings, it could be stated that the materials used in the experimental and control groups did not cause any significant difference ( $t_{(76)}=0.505$ ,

$p < 0.05$ ) in terms of self-efficacy beliefs of the pre-service elementary teachers in science teaching. In other words, it was concluded that both technology based materials and teacher-made teaching materials used in science teaching caused the same degree of effect on the self-efficacy beliefs in science teaching.

### Findings Related to the Hypothesis

The findings obtained at the end of the analysis of the hypothesis and presented in Table 4 indicated that there was no significant difference between the post-test scores of the experimental group and the control group in terms of SSEBST self-efficacy belief sub dimension ( $t_{(76)} = 0.664$ ,  $p > 0.05$ ) and the output expectancy sub-dimension ( $t_{(76)} = 0.045$ ,  $p > 0.05$ ). In the light of this finding, it was concluded that a and b sections of the hypothesis were not proved. In the end, the use of both technology based materials and teacher-made materials had a positive effect on the self-efficacy beliefs of the pre-service elementary teachers in science teaching.

**Table 4.** The t-test Results for the Difference between the SSEBST Scores (Posttest) of Control and Experimental Groups

Scale	Scale Dimensions	Groups	N	$\bar{X}$	S	t	df	p
SSEBST	Self-Efficacy Belief	Exp.	40	42.35	5.62	0.664	76	.509 $p > 0.05$
		Control	38	43.08	3.87			
SSEBST	Output Expectancy	Exp.	40	20.03	2.7	0.045	76	.964 $p > 0.05$
		Control	38	20	2.16			

## Discussion

The main finding of the study was that the self-efficacy beliefs of the pre-service elementary teachers in science teaching, which were crucial for effective science teaching, were not affected by the teaching materials being either technology based which was considered as modern, or teacher-made which was considered as traditional; however, the use of material, no matter what its structure was, affected their self-efficacy beliefs in science teaching in a positive way and increased remarkably. This finding is parallel with the findings of some studies (Emer and Hickman, 1991; Ghaith and Yaghi, 1997; Gibbs, 2002; Morrell and Carroll, 2003; Plourde, 2002; Stein and Wang, 1988) that examined the relationship between some variables and self-efficacy beliefs in science teaching. For example, Ghaith and Yaghi (1997) found a significant and positive relationship between the attitudes towards the use of new approaches and methods in the instruction process and self-efficacy beliefs

of the teachers. In another study, Stein and Wang (1988) stated that the teachers who considered themselves as adequate volunteered in finding new approaches, methods and techniques for meeting the needs of their students. Gibbs (2002), in one of his studies, found that the teachers with a high level of self-efficacy beliefs used new teaching approaches and increased students' achievement and motivation at a desired level. In Emer and Hickman's (1991) study, it was determined that the teachers who had a high level of perception in terms of proficiency used effective approaches in classroom management and removed student negative behaviors.

Within the framework of the principle "studies with concrete materials and activities should be given place in especially science curricula" (Esler and Esler, 2001: 24–25) In his mental development theory Piaget mentioned, perhaps the most important condition for students' success in structuring abstract issues and concepts is the use of teaching materials; because, materials have the effect of making abstract issues concrete. This effect causes students to become more active in classroom activities and the instruction process.

To elaborate this issue, the reality of "addressing more than one sense of the students using materials in instruction process" for an effective science teaching makes teachers use their field-formation knowledge and instructional skills at the highest level and this affects their self-efficacy beliefs. On the other hand, a high level of teacher self-efficacy triggers the idea of "I can do this in the best way" and helps teachers to prepare for the courses effectively and to manage effective teaching. Briefly, it could be stated that there is an interrelationship between the self-efficacy beliefs in science teaching and managing effective science teaching using instructional materials.

The findings obtained after testing the hypothesis should be mentioned in order to make more detailed comments on the main finding. The pre-service teachers' self-efficacy beliefs and output expectancy in science teaching increased using both modern and traditional teaching materials.

At the end of the testing of hypothesis, it could be claimed that "The material use activities, which help students to participate actively and increase their curiosity, interest and motivation during the instruction process, make teachers change their self-efficacy beliefs and output expectancy in science teaching in a positive way."

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## Effects of Graph Type, Conceptual Domain and Perceptual Organization of Information on Graph Comprehension

### Abstract

The growing interest in using graphs in education created the need for research-based guidelines. This study examined the effects of graph type, conceptual domain and perceptual organization of information on graph comprehension. Forty-two undergraduate students were given eight different kinds of graphs, and their descriptions were analyzed. The results indicated that graphical reasoning was influenced by perceptual grouping of information in visual chunks rather than by type of graph. Learners faced difficulties when an unconventional graph format was used. Implications for research and practice were also discussed.

*Key words: graphs, comprehension, cognitive processes, visual perception, display layout.*

### Introduction

There has been a growing interest in how to use graphs effectively for presenting quantitative data in education (Lowrie & Diezmann, 2009), because appropriate graphical displays can facilitate learning (Vekiri, 2002). However, when the relevant information is not explicitly expressed in graphs, understanding them may be effortful and error prone (Elzer et al., 2006; Shah & Hoeffner, 2002). Although several books (Bertin, 1983; Schmid, 1983, Tufte, 1983, 1990, 1997) have been published on the design of these visual displays, the guidelines of these books were based on the intuitions of their authors, not on sound psychological theories.

Examining what affects graphical reasoning can provide valuable information for the design of more effective graphs (Peebles & Cheng, 2003). Graphical reasoning may be driven by top-down (e.g. conceptual) and/or bottom-up (e.g. perceptual) processes (Hegarty, Canham, & Fabrikant, 2010; Holsanova, Holmberg, & Holmqvist, 2009). Specifically, graph comprehension may be influenced by perceptual properties of the graph (e.g. layout of the elements of the graph), conceptual prior knowledge of the viewer, and/or type of graph (e.g. bar graph, line graph) (Canham & Hegarty, 2010; Körner, 2005; Shah, Mayer, & Hegarty, 1999; Ratwani, & Trafton, 2008; Winn, 1994).

Zacks and Tversky (1999) investigated the effects of graph type (i.e. bar graph and line graph) on graphical comprehension. They found that more comparison descriptions were made from bar graphs and more trend descriptions were made from line graphs. Similarly, accuracy in comparison judgments was higher from bar graphs than pie graphs (Simkin & Hastie, 1987). Taken together, these results indicated that graph type had a significant influence on graphical reasoning performance (Bauer, Guerlain, & Brown, 2010; Peebles, 2008)

As Novick and Catley (2007) asserted, interpretation of graphs may be determined by perceptual grouping of information in which visual chunks were constructed according to the Gestalt principles (e.g. connectedness, proximity) rather than by graph format (bar graph, line graph). In order to test the two opposing hypotheses, Shah et al. (1999) created four informationally equivalent graphs and asked participants to describe them. They argued that if perceptual organization of information had dominance over graph type, the participants would more likely describe across-years trends in Figure 1A and Figure 1B, where trends were explicitly represented in visual chunks, but the participants would make more within-year comparisons in Figures 1C and 1D. On the other hand, if graph type was more dominant than grouping of information in visual chunks, it was expected that people would more likely describe across-years trends in line graphs (Figures 1A and 1C), but they would tend to make within-year comparisons in bar graphs (Figures 1B and 1D). Their results showed that it was easier to interpret graphs that support perceptual processes, like pattern perception and association, than graphs that required complex inferential processes, indicating that this interpretation was not affected by graph format (i.e. bar graph, line graph), but rather influenced by perceptual grouping of information based on the Gestalt principles. Presenting relevant information directly in visual chunks by grouping them perceptually would facilitate comprehension of graphs (Casner & Larkin, 1989).

However, Figure 1C used in this study showed unusual graphs for the learners, because the ordinary graphic convention was disobeyed when the categorical

information was connected. As this graph was problematic for the task of describing within-year comparisons, the participants might have difficulty in comprehending the meaning from it and this might have an effect on the subjects' interpretations. The other problem of these graphs was their unequal complexity. Figures 1C and 1D could be considered as more complex than Figures 1A and 1B, thus this difference in the complexity of the graphs might have a profound effect on the participants' graphical reasoning.

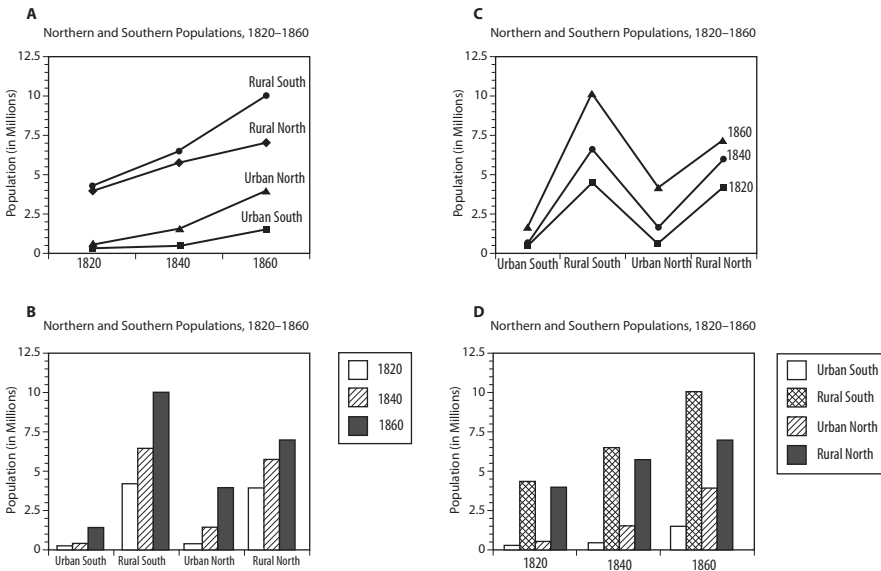


Figure 1. Graphs used in the 3rd experiment of Shah, Mayer & Hegarty (1999).

Körner (2005) demonstrated that when the perceptual properties of a graph were incompatible with the conceptual knowledge of the learner, the learner was unable to comprehend the display. Novice learners were more likely to develop misconceptions about graphs since their reasoning was mainly driven by perceptual information on graphs (Lowe, 2003). Zacks and Tversky (1999) showed that participants could make trend descriptions in line graphs when the conceptual domain was categorical (i.e. gender), demonstrating that people might create wrong interpretations of graphs when invalid graphs were used. Zacks and Tversky examined the influence of conceptual domain (i.e. gender as a categorical conceptual domain and height as a continuous conceptual domain) on graphical reasoning. Zacks and Tversky also found that viewers were more likely to make comparisons when the conceptual domain was discrete and they

were more likely to make trend assessments when the conceptual domain was continuous, showing the importance of conceptual information of graphs for graphic communication.

In sum, it is not clear from existing research whether the perceptual properties of display, conceptual information in the display, and/or the type of display determined graphical comprehension. Therefore, the goal of this study was to investigate the effects of graph type (bar and line graph), conceptual domain (continuous and discrete), and perceptual organization of information (within-year and across-years visual chunks) on graph comprehension. We expected that perceptual grouping of information rather than the type of graph would have an effect on the viewers' interpretations of graphs. We also predicted that the participants would make more comparison judgments when the conceptual domain was categorical and more trend judgments when the conceptual domain was continuous. Finally, we expected that the participants would face difficulties while interpreting the graphs when graphic convention was violated by connecting the categorical information.

## **Method**

### **Participants**

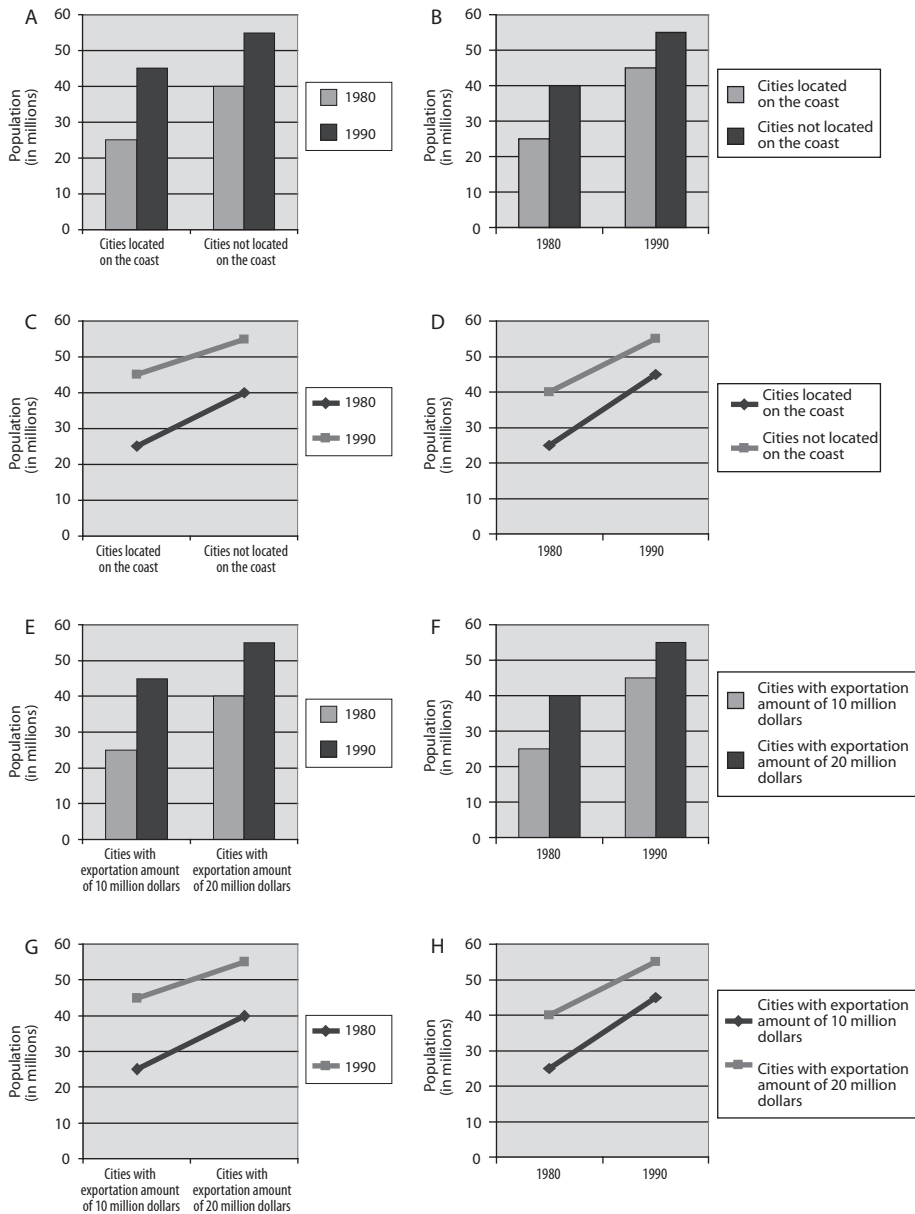
The subjects of this experimental study were 42 (18 female and 24 male) third-year students of the Computer Education and Instructional Technology Department at Middle East Technical University, who were given extra course credit for participation in the study. They were between 20 and 25 years of age ( $M=22.07$ ,  $SD=1.47$ ).

### **Design**

The experiment had a 2 (graph type) X 2 (conceptual domain) X 2 (perceptual organization of information) factorial design with the second variable as a between-subjects variable, the first and the third ones as within-subjects variables. The dependent variables were i) trend reasoning, ii) comparison reasoning, iii) mixed (both trend and comparison) reasoning, and iv) other kind of reasoning.

### **Materials**

A total of 8 different kinds of graphs were created for the study. Of these stimuli, two kinds of informationally equivalent displays, either bar graph (i.e. Figure 2A) or line graph (i.e. Figure 2C) were formed. For each of these displays, two kinds



**Figure 2.** Graphs used in the current experiment. The population of cities located on the coast and cities not located on the coast (A, B, C, D), and cities that have an exportation amount of 10 million dollars and 20 million dollars (E, F, G, H) in years 1980 and 1990.

of informationally equivalent graphs that emphasized either within-year visual chunks (Figure 2B, Figure 2C, Figure 2F and Figure 2G) or across-years visual chunks (Figure 2A, Figure 2D, Figure 2E and Figure 2H) according to the Gestalt principles of proximity and connectedness were created. The conceptual domain was either discrete (Figure 2A, Figure 2B, Figure 2C and Figure 2D) or continuous (Figure 2E, Figure 2F, Figure 2G and Figure 2H). The discrete variable had two levels: cities located on the coast and cities not located on the coast. The continuous variable was exportation amounts of cities. A total of 2 sets of stimuli that had different data series were formed, so that each participant saw a total of 8 different stimuli. Arbitrary labels were used to refer variables in order to prevent the influence of the participants' prior knowledge, because some users may rely on their prior knowledge about the content instead of information shown in the display (Shah & Hoeffner, 2002). The materials were submitted for criticism to two experts who had experience in visual design and instrument construction to assure their accuracy and validity.

### Procedure

A booklet of graphs was given to each participant. The participants were randomly assigned to one of the two graph type conditions. The orders of the graphs were counterbalanced across subjects in order to eliminate order effects for within subject variables (i.e. conceptual domain and perceptual organization of information). The direction, "Please describe in a sentence the relationship shown in this graph" (Zacks & Tversky, 1999) was given at the top of the booklet. The participants were requested to write their descriptions in the booklet. These descriptions were classified as either i) comparison, ii) trend, iii) mixed description, or iv) other by using criteria of Shah et al. and Zacks and Tversky. Accordingly, a description was coded as i) comparison if the sentence included terms like more/less, more/fewer, higher/lower, larger/smaller, and stronger/weaker; ii) trend if the sentence included terms like increasing/decreasing, rising/falling, function, relationship, correlation, varies, and trend; iii) mixed if the sentence included both comparison and trend; iv) other if the sentence did not include the expected comparison or trend statement. Two raters classified the written descriptions. The two raters agreed on 94% of the classification of the descriptions. Consensus was achieved for incongruous classifications. After the categorization of the statements, the proportions of trials that were i) comparison, ii) trend, iii) mixed, and iv) other were computed separately. For the analysis, the proportions of the descriptions were calculated for each of the 8 graphs and were used as dependent variables (comparison reasoning, trend reasoning, mixed reasoning, and other kind of reasoning).

## Results

Of the 42 subjects who participated in this study, 8 were excluded in analysis because examining their descriptions showed that 4 of them did not understand the directions and the other 4 did not know how to read the graphs used in the experiment. A 2 X 2 X 2 mixed analysis of variance (ANOVA) on trend reasoning was conducted with the graph type (line and bar) and perceptual organization of information (within-year and across-years visual chunks) as within-subjects variables, and conceptual domain (continuous and discrete) as the between-subjects variable. The graph type effect on trend reasoning was not statistically significant,  $p > .05$ . However, representing trend information explicitly in visual chunks according to the perceptual organization hypothesis had a significant influence on trend descriptions,  $F(1, 32) = 4.15, p = .05$ . As parallel to the findings of Shah, Mayer and Hegarty's (1999) study, the participants were more likely to describe trends in the graphs that had across-years visual chunks ( $M = .77, SD = .29$ ) than within-year visual chunks ( $M = .65, SD = .30$ ). The proportions of trend descriptions with respect to within-year and across-years visual chunks are shown in Figure 3.

Although the conceptual domain of graphs had no significant effect on the participants' trend descriptions,  $p = .53$ , there was a trend towards more trend descriptions in the continuous conceptual domain ( $M = .74, SD = .24$ ) than in the discrete conceptual domain ( $M = .69, SD = .26$ ). Three additional 2 X 2 X 2 mixed analyses of variance on comparison, mixed and other reasoning were made with the graph type and the perceptual organization of information as within-subjects variables, and the conceptual domain as the between-subjects variable. No statistically significant effects were found except the effect of the conceptual domain on the descriptions of other,  $F(1, 32) = 4.13, p = .05$ . The effect of the conceptual domain on the descriptions of other was worth considering because the participants made more other kind of descriptions such as "I don't understand this graph", and "...the populations of the cities increase, but the exportations of the cities increase between 1980 and 1990" when the conceptual domain was discrete ( $M = .05, SD = .08$ ) than continuous ( $M = .01, SD = .03$ ). The data also indicated that there was no significant interaction between graph type and conceptual domain, graph type and perceptual organization, conceptual domain and perceptual organization, as well as graph type, perceptual organization and conceptual domain.

## Discussion

The results of this study provided evidence that the subjects' interpretations of graphs were influenced by the perceptual grouping of information in visual chunks rather than by the type of graph. These findings agreed well with the ones of Shah, Mayer and Hegarty (1999). This study also contributed to the validity and generalizability of the experiments of Shah et al. by testing the effects of the conceptual domain on graphical reasoning and by using graphs that were equivalent in complexity. On the other hand, it can be argued that time dimension (1980 vs. 1990) was much simpler to read and understand than the other dimensions of whether the cities were at the seaside and the exportation amount of cities. Thus, the difference in the complexity of the dimensions could affect the graphical reasoning of the participants.

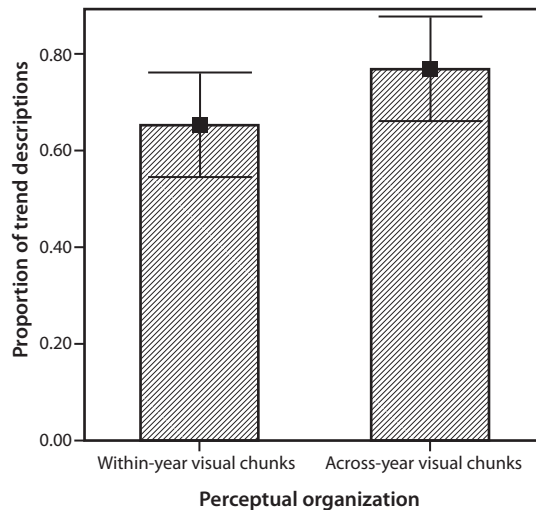


Figure 3. Proportion of trend descriptions with respect to within-year and across-years visual chunks

Prior research showed that conceptual information in a graph influenced graphical comprehension (Zacks & Tversky, 1999). Although the data in the current study failed to show such a statistically significant influence, the subjects made more trend assessments when continuous information was used than when discrete information was used as prior research suggested. Not having a statistically significant effect of conceptual information can be explained by the large standard deviation.

A significant effect of conceptual domain on descriptions of other was found, indicating that the participants experienced more problems in reading graphs when the conceptual domain was discrete than continuous. This showed that when an unconventional graph format was used, the participants faced difficulties. However, it was not easy to attribute this difficulty to a learning problem or an innate property of the cognitive system. For a more detailed discussion on this issue, one may confront Gattis and Halyoak (1996).

This experiment also showed that the participants had a tendency to make trend descriptions. A possible explanation for this finding was the participants' bias in making higher-level explanations of the graphs when trend analysis was considered as a higher-level decision than discrete comparison. Another possible explanation was that because of the simplicity of the graphs used in the experiment, it was very easy for the subjects to make a trend assessment mentally or explicitly by using a pencil. Drawings that were made on the graphs by the participants provided evidence for this possibility.

## **Implications for Research**

As mentioned before, the experiments of Shah and others may be influenced by the unequal complexity of the stimuli used in the treatments. Although the present research used similar complex graphs, future research might investigate the effects of graph complexity on graphical reasoning. An experiment may be conducted to examine the origins of students' tendency towards making trend analysis. The two competing hypotheses, the bias of participants towards making higher order descriptions or simplicity of graphs, could be tested in a study.

## **Implications for Practice**

Considering the findings of this study, educators should give more importance to the perceptual organization of information, especially how visual chunks represent the intended message. Visual clusters of information based on perceptual features (e.g. proximity) should be easily formed (Ratwani, Trafton, and Boehm-Davis, 2008). The Gestalt principles of proximity and continuity can be employed to create appropriate visual chunks by grouping the elements that are close together, and by assembling elements through a smooth line, respectively.

Besides, the results of the study proposed that if graphs are used appropriately, they can facilitate higher order reasoning (Gattis & Halyoak, 1996; Mautone & Mayer, 2007). On the other hand, if conventional use of graphs is violated, viewers' reasoning

may be impaired. The conceptual domain of information depicted in the graphs may disrupt graph perception (Tversky & Schiano, 1989; Zacks & Tversky, 1999).

Graphical designers should take into account the conceptual and perceptual processes of learners when they try to understand graphical displays. As proposed by Carpenter and Shah's (1998) model, graph comprehension was a multiple and integrative cycle of three major processes: pattern recognition that encode visual patterns, construction of meaning that translates the patterns into relations, and relating the meaning to the referents identified from the variable names, labels, and scales. The natural mapping between perceptual relations in visuospatial representations and conceptual relations could facilitate visual reasoning when graphs were used appropriately (Gattis & Halyoak, 1996).

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**Pedeutology**



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## Peer Assessment in Higher Education. A Case Study

### Abstract

The need to use other grading methods that will help to certify and/or qualify teachers' grades in extensive groups of students led us to implement peer assessment. Our research was carried out over the last two years, and the students assessed one of the practices among themselves, using one of the tools from a virtual teaching platform. Their grades were subsequently analysed to see if they showed similar results to the teachers' grades, by means of a correlation analysis. The high correlation found suggests that teachers could take the students' grading into account if necessary.

**Key words:** *higher education; evaluation; educational technology; electronic learning; benchmarking.*

### 1. Introduction

The study was carried out at the Faculty of Education Sciences at the University of Malaga (Spain) within the New Technologies applied to Education (NTAE) subject, which at our University has groups of one hundred students on average.

We believe it is advisable for our students to acquire the professional ability to assess projects and tasks, an ability that can be achieved through participation in assessment tasks (Ibarra, Rodríguez & Gómez, pp. 9–10). The reason for this is that assessing will be a major task in their future professional life. Assessment at university has traditionally, and almost exclusively, been the job of the teaching staff, (Liu & Carless, 2006, p. 285; Nicol & Macfarlane-Dick, 2006, p. 180), and this

continues to be the case, despite the fact that new evaluation trends highlight the need to move away from a summative assessment towards a more formative assessment (that comes from the students themselves and is based on self-learning), from a teacher-based assessment to participative assessment (González, Díaz & García, 2006, pp. 108–109), from a control-based assessment to one focusing more on learning (Bordas & Cabrera, 2001, p. 26).

In the specific case of NTAE, it is essential to carry out varied practices that develop into practical credits; however, sometimes, and for a number of reasons (lack of resources, large student groups, focus that each teacher gives his/her subject, etc.) the practical side of the subject leads to pseudo-practical credits. Bearing in mind, on the one hand, as pointed out by the psychiatrist William Glasser (as cited by Díaz & Doménech, 1999), that we learn a lot more when we debate and practise than when we read or listen, and on the other hand, that in NTAE (because of the nature of the subject) there is a lot of new content with interesting educational possibilities (content syndication, wikis or blogs, etc.), practical implementation is necessary to achieve effective learning.

At this point we find ourselves with a complicated task for teaching staff: the assessment of a wide range of practices with large groups of students. How can they be evaluated without the teaching staff taking on excessive amounts of work in the task of assessment? In real terms, evaluation overstrain can lead to certain practices not being carried out, to others being modified, to joining together several practices in a more or less artificial way, etc. when our day-to-day work clearly shows that they need to be implemented.

For the purpose of this study, we decided to use peer assessment (PA), also known as co-evaluation or peer review<sup>1</sup>, in one of the practical activities in our subject, in order to evaluate whether it showed similar results to the teachers' assessment, and with the intention of taking it into account as a qualification and/or support of the grade issued by the teacher.

Given that we were also interested in gathering information from the students as regards the process itself, we used the following data collection instruments:

- The assessments given by the students, issued on the distance training platform used in the subject (an adaptation of Moodle).
- An open questionnaire which aimed to gather general information about the evaluation process. This information was then analysed using qualitative techniques.

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<sup>1</sup> PA is the willingness to assess and be assessed by group members, bearing in mind that they all have a similar level of knowledge and abilities.

Several peer assessment projects (Topping, 1998, p. 260; Marín, 2006, p. 23) conclude that there is a high correlation between students' and teachers' marks. It is even noted that, given the results, peer assessment appears to be an alternative assessment method that could be applied more frequently in higher education (Şahin, 2008, p. 6). This is precisely our intention: to ensure the design of an activity and assessment strategy that would guarantee that students' and teachers' marks are sufficiently similar as to be able to take them into account in subject assessment.

### **Advantages and disadvantages of PA**

Several authors (Liu & Carless, 2006, p. 282; Topping, 1998, p. 254; López, González & Barba; Şahin, 2008, p. 2; Segers & Dochy, 2001, p. 331) put forward several advantages of PA:

- Having to evaluate classmates' work contributes to their learning process.
- It increases their motivation to learn, as their assessment of classmates is a means of self-assessment.
- It improves their perception regarding the quality of their work.
- It increases responsibility and satisfaction in the learning process.
- Evaluating others implies learning, as it entails expressing and reasoning one's assessment motives.

However, PA has also been acknowledged to have certain disadvantages (Van Den Berg, Admiral & Pilot, 2006, p. 345), as the students may:

- Not be sufficiently mature for this purpose.
- Not take the assessment seriously.
- Have negative attitudes to assessment of this nature.
- Consider the assessment as an additional burden.

Lastly, we have compiled some recommendations in order to improve the PA process (Ibarra, Rodríguez & Gómez, pp. 6–8):

- The importance of keeping the assessment process anonymous (you should not know who is assessing you or who you are assessing) to ensure that relationships with friends do not affect the evaluation. Most peer assessments carried out to date have been based on evaluating written work on paper or other formats, which does not guarantee the person being assessed will remain anonymous. This fact increases the chances of collusion and bias, partial evaluation of friends and grading pacts between classmates. Nevertheless, with the technical possibilities available today, this disadvantage may be significantly mitigated.

- Sufficient and appropriate time must be set aside so that students can carry out their assessments.
- Use of the same criteria for all those participating in the PA, which should be set beforehand, be known by all and be presented in terms with which all students will be familiar.

The main point of contention between research studies is the degree of reliability of the marks awarded by students, as we find some studies showing that marks given by teachers and students have a high correlation (Fry, 1990) and others in which there is a low correlation (Kwan & Leung, 1996).

## **2. Material and methods**

This research has been carried out over the last two years, selecting an activity for peer assessment. One of the University of Malaga's Virtual Campus (<http://www.campusvirtual.cv.uma.es/>) tools has been used as an assessment instrument, this being an adaptation of Moodle (<http://moodle.org/>), specifically the workshop activity.

In a "learning by doing" style, one of the practical tasks in the subject was for the students, in groups, to write a blog on a topic of their choice (although it had to be related to education), and which had to be kept active for a period of two months, and each member of the group had to contribute at least four entries (news).

In line with the aforementioned recommendations, the activity was designed in the following way:

1. The same criteria were used for all those who took part in the PA. An assessment scale was prepared with clear, concise items adapted to the work in question, and taking into account that the purpose of the practical activity was for the students to know what a blog was and to learn the technical basics to create, manage and maintain a blog. This scale was drawn up by the teaching staff and it was known by all parties before commencing. It had the following criteria:
  - Placement of the number of required entries (minimum of 4 for each group member).
  - That the entries were the result of personal work and reflection, and they were not supposed to be copied from other websites.
  - That they should have links to other interesting websites, and images and external elements (videos, presentations, etc.) wherever necessary.

- There should be no spelling, grammar or punctuation mistakes. Even though this may appear to be overcome in university education, it is by no means the case (Quirós, 2008).  
The assessment scale used ranged from 0 to 15 points:
  - 1 to 5 points: The required number of entries has not been placed and/or there are many spelling mistakes.
  - 6 to 10 points: The minimum number of entries has been placed. There are links to other interesting sites and images. There are some spelling mistakes.
  - 11 to 15 points: The entries are interesting. There are links to external elements (images, videos, etc.). There are no spelling mistakes.
- 2. The evaluation was anonymous, using the workshop module of the Moodle platform to ensure the work's anonymity, both regarding the person sending a project and the person correcting it.
- 3. Group structure. Each group of students created a blog, and all its members were the blog administrators so they all shared the same privileges. Each member began working individually, although in coordination with the rest of the group as regards the subject matter, length of entries, inclusion of multimedia elements, relevance of the entries' subject matter, etc. Once the period allocated to complete this blog had concluded, it was graded through the aforementioned workshop.
- 4. Sufficient and appropriate time was set aside to carry out the assessments. Prior training was carried out, collectively evaluating some blogs as an example; a one-hour class session was taken up with evaluating the blogs, in which each group assessed two blogs created by their classmates.

Furthermore, at the end of the academic year, in order to find out the students' opinion on the process with the purpose of improving in following years, they were asked to voluntarily and anonymously fill in a questionnaire of open questions through the Virtual Campus.

### **3. Results**

#### **3.1. Statistical analysis of the grades awarded to the blogs**

The exercise entailed the assessment of 55 blogs corresponding to two groups (one for each academic year). The teacher's grades were established at an average of 13.24 points and a variance of 1.78. The minimum value was 9 and the maximum 15 (6 point range).

For their part, the students' evaluations gave somewhat lower (an average of 12.73) and more homogeneous (variance of 0.98) marks. They go from 8.5 to 14 (5.5 point range). These results are in line with those obtained in other studies (Montero, 2006, p. 37) that point out that students tend to concentrate their grading more and discriminate less than teachers.

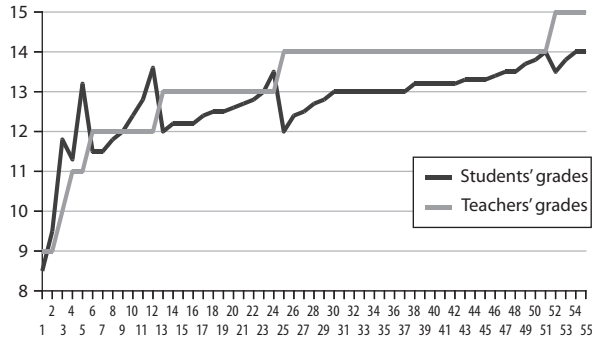


Figure 1: Grades from the teacher and the students

The maximum difference between the teacher's grades and the students' grades can be seen in Figure 1 to be two points.

To determine the degree of agreement between the students' and the teachers' assessments, we used several procedures. A review of the existing literature on this subject indicates that the following procedures are usually applied (Marín, 2009, p. 18):

- Correlation between the average marks given by the students and the mark awarded by the teaching staff.
- The students' marks are within the confidence interval that is generated from the teaching staff's marks.
- Hypothesis testing on the t-test of mean differences, or on the variances, between the students' and the teachers' marks.

In order to verify whether there is a correlation between the teacher's grades and those awarded by the student groups, we used the Pearson correlation coefficient, which is a statistical index that measures the linear relationship between two quantitative variables, reflecting the degree to which both are associated. In our case, the resulting value is 0.81, which shows that there is a high relationship between the teachers' and the students' assessments.

We also used the Student's t-test to verify whether there are any differences between both sets of grades. If a value over 0.05 is obtained in this test, we may

conclude that there is a difference between them. In our case, we obtained a value of 0.02, so we may declare there is no difference.

Consequently, by proving that there is a high correlation between both grades, we believe that taking into account the grades awarded by the students would be more than justified.

### **3.2. Analysis of the opinion questionnaire**

Response to the questionnaire was voluntary and anonymous, with 106 students answering out of a total of 208 (50.9%). They all found the preparation of the blog to be very interesting (fantastic, fun and enjoyable, according to some), except one, who pointed out that he/she already had a blog and had not found this exercise interesting.

The positive evaluation refers to:

- The exercise itself.
- The fact of working in a group.
- The chance to go in depth on a specific content that they specialise in.
- Its future application in the school.

Similar experiences have been found in other studies (López, E. & Ballesteros, 2008, p. 79).

Regarding the assessment, approximately 85% show a positive attitude to the possibility of being assessed by their classmates (“I think that our classmates can assess the task from a different point of view to the teacher’s”; “if tomorrow holds that we have to assess our future students, then what better way to start than this?”), although there are others who feel that there was a lack of objectivity, despite the fact that the evaluation was anonymous. In general, and in keeping with Montero (2006, p. 42), we may conclude that the experience has been rewarding for the students.

## **4. Discussion**

We have observed that the students tend to award lower grades than the teacher. This situation could suggest that we are facing a generalised tendency, although the reasons why this occurs would need to be researched in greater depth. Among the hypotheses that we were able to put to the test, there is a possible bias on the students’ part when assessing their classmates’ work. In other words, the students would tend to compare their classmates’ work with their own when assessing their peers. This benchmarking process would be associated with an attributional bias,

such that their comparison would be based on an assessment of the effort made in completing their work, with regard to the effort they attribute to their classmates. To this effect, a lower assessment would indicate that the students consider the assessed group to have made less of an effort than they themselves have made in carrying out the same task.

Alternatively, the homogeneous nature of the students compared with the teacher could indicate a certain problem of inconsistency in the teacher's evaluations. We will bear this possibility in mind in future studies, and for this reason we would include a second teacher that would enable this possible bias to be evaluated.

The value of the statistical tests used encourages us to use the students' assessments as similar to those given by the teacher.

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## Teaching Styles in Teachers Educating Romany Pupils

### Abstract

Lack of teacher training programmes specifically oriented on educating Romany pupils with socially disadvantaged backgrounds is considered by the authors to be one of the reasons why they perform poorly at school. The study is interpreting research conclusions based on lessons analyses in Romany classrooms.

*Key words: teaching style, teacher, Romany pupil, qualifications, socially disadvantaged environment, authoritarian leader index, motivation index, developing cognitive functions.*

### Introduction

One way to effectively socialise and integrate Romany people into society is to educate them. Efforts to do so have been made for decades by experts, pedagogues, educated Romany people, non-profit organisations, and European structural and social funds.

Despite the effort to improve academic status of Romany pupils, the education of Romany pupils coming from a socially disadvantaged environment is still a topical problem. Poor school achievements of Romany pupils, falling back to previous grades and incomplete compulsory schooling are among contemporary problems of the Slovak education system.

## **Identifying research problems**

The educational process of pupils coming from a socially disadvantaged environment offers a wide range of experimental research. We have focused on the teacher and his teaching style. We have analysed educational styles of primary school teachers who work with pupils coming from socially disadvantaged environment. In the context of eastern Slovakia, these are mainly Romany pupils. The research target ensued from our belief that teachers dealing with Romany pupils should necessarily get specific professional training.

With regard to the mentioned area we have articulated a few questions: “Is it necessary for a pedagogue working with socially disadvantaged pupils to have a university degree specifically targeted at Romany pupils? Is a non-specific Master’s degree in education sufficient? Would a Romany specific degree guarantee a more effective educational style? Should a teacher who has not been trained to deal with the specifics of educating Romany pupils be allowed to teach them?”

It is not our aim to provide unequivocal answers, however, we were trying to respond to some of them by means of a teaching styles analysis in two groups of teachers. We have been exploring the teaching styles of teachers trained for work with Romany pupils as well as those without specific training. The research sample comprised 20 teachers with specific training for work with socially disadvantaged children and 20 teachers without such specific training.

## **Research goals and hypotheses**

*The aim of our research was to analyse selected problems and associations related to and affecting educational work of the teacher working with pupils from a socially disadvantaged environment. We tested the influence of teachers’ qualifications/degree types on their teaching styles.*

A teacher competent to work with Romany pupils is, in our opinion, the one who has professional skills and experience with a strong focus on Romany pupils’ educational specifics. Such competences may be acquired by means of a Master’s teacher training programme for the first stage of elementary school specialising in Romany community or a study programme specifically targeted at work with Romany pupils (specific innovative study programme, postgraduate expanding study, in-service training, education within PHARE project, education programme Step by step, etc.).

We explored differences in teachers’ work effectiveness with Romany pupils with

regard to their qualifications. By gathering data we wanted to confirm or refute the assumption that one reason (beside others) for Romany pupils' poor school performance is a lack of teacher qualifications for working with this type of pupils. After having considered our possibilities and limitations we posed a research question. *How is a teaching style influenced by the quality of the teacher's professional qualifications?* We expected that our assumptions stated would be confirmed. We assumed that the teaching style of qualified teachers compared to non-qualified ones will be more effective (better, more creative, more interesting, more motivating, less authoritative).

With regard to the research aim we formulated the following hypotheses:

- H1: *Teachers' qualifications for work with children from a socially disadvantaged environment reduce the level of authoritarian leadership approach in their teaching style.*
- H2: *Qualifications for teaching children from a socially disadvantaged environment increase motivation in their teaching style.*
- H3: *Teachers' qualifications for working with children from a socially disadvantaged environment increase the development of cognitive functions in their teaching style.*

We tested the hypotheses in a quasi-experiment whose reliability is based on testing alternating hypotheses (interchanging the independent variable). Thereby we formulated additional alternating hypotheses (for more detail cf.: Novotná, Portik, 2007).

## **Research methods**

The main method of the research was an observational microanalysis of the educational process. One of the starting axioms in microeducational analyses is the axiom of *the fact in education*. The fact in microanalysis may be any sentence or practical demonstration of the teacher as well as the pupil in their mutual interaction. Out of the abundant existing procedures and schemes, we used Flanders' system of the teacher teaching style observation. The number of observed items (originally 10) were reduced to six by Flanders, to form the system OSTRAQ ("ostrich"):

The basic and most important starting point of the microteaching analysis in our research was concentration on the *teacher's activity* – his/her behaviour and language, his/her questions, stimuli, gestures, movement, whose influence on pupils is then inferred. We especially analysed the teacher's activity, because the

teacher carries out the process of education (that is why we did not record the items O – silence in the classroom, and S – behaviour of pupils).

*The teacher's teaching style* is characterised as application of invariant modes of actions on the educatee. The style is the result determined by personality rather than the situation (Zelina, 1994). The teaching style effectiveness depends not only on the situation and content of teaching, but particularly on interacting persons. In our research, the teacher's teaching style was measured by means of three indices: authoritarian leadership (dirX), motivation and cognitive functions development indices.

The research results are interpreted by individual indices in the groups of teachers under observation.

## **Research results**

### **Authoritarian leadership (dirX) in the teaching style of Romany pupils' teachers**

The teachers qualified to work with Romany pupils give more positive evaluations in comparison with the unqualified teachers. The difference between the groups of qualified and unqualified teachers is statistically significant. This was confirmed not only in the authoritarian leadership index (dirX), but also in some components forming its fundamental parts. The difference in averages of positive evaluation (dirmotA) between the groups of qualified (91.25) and unqualified (53.75) teachers is statistically significant at the 0.01% level of statistical significance.

Qualified teachers were giving positive evaluation in the teaching process in individual phases of the teaching unit consciously, i. e. intentionally, purposefully, systematically and fairly. It was this fact that was absent in the majority of unqualified teachers. One of the reasons for this is probably the teachers' professional qualification as well as didactic competence and capability to work with Romany pupils. We also suppose that during their training, qualified teachers were being prepared for the fact that Romany pupils are emotionally sensitive and expect positive feedback from their teacher for each success or progress in their learning.

The average value of negative motivation (dirmotR) with the qualified teachers was lower (22.70) than in the group of unqualified teachers (36.35). The difference in the averages between the groups of teachers under observation is statistically significant at the 0.01% level. This shows that the unqualified teachers are more critical towards Romany pupils than the qualified teachers. An interesting finding is that when observing the frequency of a teacher's interpretation during a lesson,

**Table 1.** Index of directiveness

Student's (un-paired) t-test for independent samples									
Items	Qualified teachers				Unqualified teachers				KU-NU t - test
	A.M.	S.D.	MIN	MAX	A.M.	S.D.	MIN	MAX	p
<b>dirmotA</b>	91.25	17.70	65	123	53.75	13.32	31	75	0.000000**
<b>dirQ</b>	102.35	33.25	72	215	84.90	17.81	65	136	0.056517
<b>dirT</b>	117.9	19.37	85	152	89.55	29.95	42	145	0.001033**
<b>dirmotR</b>	22.70	7.83	9	35	36.35	16.45	5	58	0.001832**
<b>dirX</b>	1.39	0.25	0.89	2.06	1.18	0.37	0.82	2.18	0.021491*

**Legend to Table 1**

dirmotA – positive motivation

dirQ – teacher's questions

dirT – teacher's interpretation,  
instruction, explanation

dirmotR – negative motivation

dirX – index of authoritarian leadership

A.M. – arithmetical mean

MIN – minimum value

MAX – maximum value

S.D. standard deviation

\* differences are statistically significant  
at least at the 0.05 % level\*\* differences are statistically significant  
at least at the 0.01 percent level

the average value (of explanation, instruction) was 117.9 in the qualified teachers and 89.55 in the unqualified teachers. This difference between the groups of teachers under observation is statistically significant at the 0.01% level in favour of the qualified teachers. One of possible explanations for this result may be that qualified teachers understand that due to the communication handicap of Romany pupils (at the lower primary school) it is necessary to explain requirements and tasks several times, formulate them in different ways, repeatedly remind of them, so that the Romany pupils understand the teacher and understand the task or requirement given by the teacher.

A significant finding in relation to the formulated hypothesis H1 is that the difference in the averages of the authoritarian leadership index between the qualified and unqualified teachers for work with Romany pupils is statistically significant at the 0.05% level. The average value of the authoritarian leadership indices is  $I_d = 1.39$  in the qualified teachers, and  $I = 1.18$  in the unqualified teachers. It follows from the data that the unqualified teachers show a statistically significantly lower rate of indirectiveness in their teaching styles in comparison with the qualified teachers. Thus, the assertion expressed in hypothesis H1 is true, i.e. teachers' qualifications for work with children from a socially disadvantaged environment reduces the rate of authoritarian leadership in their teaching styles.

## Developing motivation in the teaching style of teachers educating Romany pupils

By observation of positive evaluation we found out whether the teachers were motivating Romany pupils in the process of education. We observed expressions of consent, praise, encouragement, confidence, ways of activity motivation, development of self-evaluation.

Observation of negative evaluations of a Romany pupil by a teacher focused on correction, criticism, irony, sarcasm, punishment, abuse and humiliation. We also observed a lack of evaluation by a teacher, emphasis on teacher authority and corporal punishment.

The ratio of positive (dirmotA) and negative (dirmotR) evaluation is the motivation index indicator.

**Table 2.** Motivation index – positive evaluation of Romany pupils by teachers

Items	Qualified teachers				Unqualified teachers				KU-NU t – test
	A.M.	S.D.	MIN	MAX	A.M.	S.D.	MIN	MAX	p
dirmotA	91.25	17.70	65	123	53.50	13.32	31	75	0.000000**
motA1	34.40	13.02	15	56	29.50	11.38	14	51	0.255914
motA2	40.80	9.99	22	58	20.20	10.52	7	49	0.000008**
motA3	5.55	6.11	0	18	1.95	2.14	0	7	0.067869
motA4	2.8	2.42	0	10	0.70	0.65	0	2	0.000484**
motA5	3.4	6.52	0	28	0.45	0.94	0	4	0.024759*
motA6	4.90	4.09	0	13	0.95	1.50	0	5	0.000211**

### Legend to Table 2

dirmotA – positive evaluation

motA1 – consent

motA2 – praise

motA3 – expression of confidence, encouragement

motA4 – motivating, empathic urge to an activity, interesting

introduction of the subject matter

motA5 – interesting introduction of the subject matter

motA6 – pupils' self-evaluation

A.M. – arithmetical mean

S.D. – standard deviation

\* differences are statistically significant at least at the 0.05 % level

\*\* differences are statistically significant at least at the 0.01 % level

We found out the following: Differences in the averages between the groups of qualified and unqualified teachers of Romany pupils within the positive evaluation were in motA2 representing a praise of a Romany pupil by a teacher at the 0.01% level of statistical significance. The average value of praises expressed by the unqualified teachers was lower by a half in comparison with the qualified teachers.

The significance of this difference is in the fact that the unqualified teachers do not give Romany pupils sufficient feedback by means of a praise, which we consider as a considerable shortcoming in a teacher's teaching style.

In motA4 representing *a teacher's motivating, empathic urge* to an activity of Romany pupils, the difference in the averages of the observed groups was found significant at the significance level of 0.01%. In mot5 representing *interesting introduction of the subject matter*, at the 0.05% level of significance. This finding confirms the fact that in the process of education the above specified items of positive motivation are absent in the teaching style of the unqualified teachers. One reason for this may be that the teachers are not trained for work with Romany pupils and their didactic competence to teach them is insufficient.

The next of the positive motivation items under observation was *pupils' self-evaluation*. We supposed that it would be qualified teachers, in comparison with unqualified ones, who lead Romany pupils to self-evaluation and critical evaluation of their achievement. This supposition was based on our knowledge that development of evaluation and critical thinking is not of prevalence in our schools. Likewise, this sphere is not represented appropriately in undergraduate teacher training, in relation to other areas of teacher training, and if so, then not comprehensively and systematically enough, but depending on the concept of the given subject, which the teacher often designs depending on his/her professional orientation.

We supposed that the teaching style of teachers having completed any form of training specifically aimed at the education of Romany pupils would be characterized by adequate application of positive motivation. Our expectations were confirmed. The difference in the averages of the qualified teachers (4.90) and the unqualified teachers (0.95) is statistically significant at the 0.01% level of significance in favour of the qualified teachers.

Negative evaluation of a pupil occurred more frequently in the case of the teachers not qualified for work with Romany pupils. The average of negative evaluation was 13. in the group of unqualified teachers and 6.05 in the group of qualified teachers. This difference is statistically significant at the 0.01% level in favour of the qualified educators. Given the position and attitude of a Romany pupil at school (strange environment, poor command of the Slovak language, school daily routine, school-related duties, etc.), as well as given the attitude of a Romany family to education, a negative evaluation of a Romany pupil prevailing over a positive evaluation in a teacher's teaching style is an aspect that is inappropriate and unprofessional.

In the Romany hierarchy of values, education is of no priority or prospect. Romany pupils have a *different system of values* than majority pupils. The school

**Table 3.** Index of motivation – negative evaluation of Romany pupils by teachers

Item	Qualified teachers				Unqualified teachers				KU-NU t – test
	A.M.	S.D.	MIN	MAX	A.M.	S.D.	MIN	MAX	p
dirmotR	22.70	7.83	9	35	36.35	16.45	5	58	0.00183**
motR1	6.05	3.23	1	13	13.40	8.08	1	31	0.00054**
motR2	13.15	5.50	4	23	15.85	10.21	3	34	0.72510
motR3	0.50	1.36	0	6	0.40	0.60	0	2	0.53913
motR5	2.55	2.12	0	7	4.85	4.50	0	18	0.08835
motR6	0.45	0.76	0	2	1.90	1.99	0	7	0.00356**
motX	4.44	1.50	2.14	7.53	2.18	2.02	0.73	8.8	0.00011**

**Legend to Table 3**

dirmotR – negative evaluation  
 motR1 – negative evaluation of a pupil  
 motR2 – corrections, criticism  
 motR3 – irony, sarcasm, derision  
 motR4 – punishment, scolding, humiliation, corporal punishment  
 motR5 – lack of evaluation  
 motR6 – emphasis on teacher authority

motX – index of motivation

A.M. – arithmetical mean

S.D. – standard deviation

MIN – minimum value

MAX – maximum value

\* differences are statistically significant at least at the 0.05 % level

\*\* differences are statistically significant at least at the 0.01 % level

as an institution and education as perceived by Romany people are irrelevant in life, unwanted. The school means a fear of everything strange. Parents are not interested in their child attending school regularly and children feel no need for education. The result is irregular school attendance and problems in education (Čačipen pal o Roma, 2002). The value of education is the least in this community also because education is connected with prospects, and these are relatively distant, and the Romany population in essence lives from day to day. Immediate survival is a part of the tradition, thus also of the system of values. And a child perceives this very sensitively (Balvín, 2000).

Within negative motivation, we recorded also an *emphasis on teacher authority* (motR6) among the respondents. The difference in the averages in this item (motR6) within the groups of qualified and unqualified teachers was statistically significant at the level of 0.01%, again in favour of the qualified teachers. We observed an emphasis on teacher authority among the qualified teachers at most twice, among the unqualified teachers at most 7 times. This phenomenon was more frequent in the group of unqualified teachers probably also because when

failing to maintain discipline among Romany pupils, the teachers turned to warnings of Romany pupils and began to act authoritatively towards them – from the position of power. We do not perceive this fact as something negative because work with Romany pupils is difficult and hard. Many a time it requires discipline of pupils or reprimanding by teachers. We would like to point to the fact that such situations may be dealt with in a different way, with different methods, designed just for solution of such difficult situations. However, a teacher not trained for the specifics of Romany pupils has no chance and/or space to become acquainted with such methods and means. Under-graduate training of teachers for the lower primary school, without any specialization, thus general to a certain degree, does not guarantee that the future teacher will acquire the necessary competences and teaching skills to deal with similar, and in their nature often even conflict. situations when teaching Romany pupils. During their study, teacher trainees become acquainted with issues of conflict situations solution particularly at the theoretical level (description of existing phenomena, situations, conflicts). However, there is a lack of methodological readiness of future teachers in the sense of transformation of the acquired knowledge into the level of competence acquisition – to be capable of solving conflict situations in the educational practice.

The average value of indices of motivation (motX) was 4.44 in the qualified teachers and 2.18 in the unqualified teachers. In principle, these average values point to the fact that the teaching style in both groups of teachers is motivating in relation to Romany pupils. However, the difference in the average values of indices of motivation between the qualified and unqualified teachers is statistically significant at the 0.01% level. This confirms the assumption presented in H2, that *qualification of teachers for work with children from a socially disadvantaged environment increases the rate of motivation in their teaching style.*

### **Developing cognitive functions in the teaching style of teachers educating Romany pupils**

Developing cognitive functions in pupils is a wider issue criticized in the educational practice for a long time. The criticism is aimed at the problem of failure to develop higher cognitive functions in pupils.

Formation of cognitive functions (particularly in pupils from a socially disadvantaged environment) should proceed so that a pupil should first master processing of the teaching material at the level – knowledge and subsequently at the level – understanding, to be able to build higher cognitive functions on this foundation, up to evaluation. The quality of cognition depends on the work at various cognitive levels.

Man's wisdom is hidden not only in the fact that he can answer a question asked, but also in the fact that he can formulate a question. "The art of asking" is, in our opinion, one of the ways leading to stimulation of critical as well as creative thinking of (not only) Romany pupils. Its by asking, provoking, and activation of thinking processes that a teacher can stimulate thinking in pupils (at least) adequately in relation to all thinking processes. We studied whether this possibility is used by qualified teachers more effectively in comparison with unqualified teachers.

**Table 4.** Index of cognitive functions

Items	Qualified teachers				Unqualified teachers				KU-NU t – test
	A.M.	S.D.	MIN	MAX	A.M.	S.D.	MIN	MAX	p
kof1	32.85	13.78	15	66	39.40	10.22	23	55	0.049865*
kof2	28.25	16.24	11	84	33.65	11.63	17	58	0.046792*
kof3	8.9	11.75	0	54	3.45	2.87	0	9	0.034867*
kof4	9.0	6.66	0	23	1.15	1.73	0	7	0.000017**
kof5	15.45	9.52	0	28	4.45	3.53	0	13	0.000022**
kof6	8.10	4.97	0	16	3.30	2.88	0	11	0.000617**
kofX	0.57	0.34	0	1.13	0.12	0.06	0.03	0.2	0.000001**

**Legend to Table 4**

kof1 – questions and stimuli for perception (sensomotori operations)  
kof2 – questions for memory  
kof3 – questions and stimuli for understanding of concepts, their naming, definition, deductive, inductive thinking  
kof4 – questions for higher thinking operations (synthesis, analysis, generalization, application)  
kof5 – questions and stimuli for evaluation and critical thinking  
kof6 – questions and stimuli for development of creativity

kofX – index of cognitive functions development  
A.M. arithmetical mean  
S.D. standard deviation  
MIN – minimum value  
MAX – maximum value  
\* differences are statistically significant at least at the 0.05 % level  
\*\* differences are statistically significant at least at the 0.01 % level

The most questions in both groups of teachers under observation were oriented to perception. The average value of the questions aimed at perception was 32.85 in the group of qualified teachers and this average was 39.40 in the group of unqualified teachers, thus relatively higher by almost 7.0 units. The difference in averages of the asked questions oriented to perception of Romany pupils between the groups under observation is statistically significant at the 0.05% level.

For kof2, recording questions aimed at memory (thus instillation, retention, processing and recollection of information), the average values in both groups under observation were comparably high in relation to the questions aimed at perception and sensomotor operations. On average, the qualified teachers asked 28.25 questions and the unqualified teachers 33.65 questions stimulating the memory processes of Romany pupils. The difference in the averages of the measured values is significant at the 0.05% level.

Note that the average values of kof1 (questions for perception) and kof2 (questions for memory) in both groups of teachers are extremely high in relation to the other items under observation (kof3 – lower convergent processes, kof4 – higher convergent processes, kof5 – evaluation thinking, kof6 – creative thinking) which should be the same part of development of pupils' cognitive functions. The given extreme, or contrast of the average values of individual items may be explained by several alternatives.

The first one is probably the fact that at the lower primary school, when teaching the basic literacy (reading, writing), a teacher cannot avoid frequent use of questions aimed at pupils' sensory perception, or at simple causal connections and reproduction of the learnt material. This is all the more augmented in education of Romany pupils, where there is also the problem of communication barrier due to the poor command of the school language.

Another possible explanation of the above extreme is the fact that the creativity of a pupil's personality is still not being sufficiently developed in Slovak schools ("Milénium", 1998). Methods and means applied by teachers in the teaching process are still not aimed at stimulation of critical and creative thinking, but they follow the path towards reproduction of the subject matter and transmission (Rosa et al., 2001).

This is proved also by our following finding: on average, the qualified teachers asked Romany pupils 15.45 questions and the unqualified teachers 4.45 questions for development of evaluation and critical thinking. The given difference between the groups of teachers of The Romany pupils under observation is statistically significant at the level of 0.01%.

Even fewer questions were aimed at stimulation of creative thinking in the Romany pupils. The average value was 8.10 questions asked by the qualified teachers, 0.12 questions by the unqualified teachers. The difference in the average values is significant in favour of the qualified teachers at the level of 0.01%.

These significant findings may closely overlap an area keenly criticized, i.e. the dominance of the content of individual teaching subjects, in particular in lower primary schools. Teachers usually defend themselves in this connection that it is time-consuming (and, in many cases, also impossible) to go through

the prescribed quantity of the subject matter with pupils. In result, there is no sufficient time left to develop creativity, stimulate critical thinking and the ability of evaluation.

Note the phenomenon in Table 4, which we would mark as an inverse relationship. It is obvious that the average values in relation to lower cognitive processes (perception, memory) are lower for the qualified teachers than for the unqualified teachers. On the other hand, the average values of kof3 to kof6 (representing recognition, definition, deductive/inductive thinking, synthesis, analogical thinking, generalization, evaluation and creative thinking) are higher for the qualified teachers than for the unqualified teachers. All the differences in the average values between the groups of teachers under observation are statistically significant in favour of the qualified teachers. In comparison with the unqualified teachers, the qualified teachers proceed in development of higher cognitive processes of the Romany pupils with more courage, more creatively. In other words: the qualified teachers in comparison with the unqualified teachers involve also higher thinking operations in the process of thinking.

The average value in the index of cognitive functions development (I<sub>kf</sub>) alone was 0.5 for the qualified teachers and 0.12 for the unqualified teachers. The given difference in the average values of indices of cognitive functions development for the qualified and unqualified teachers is statistically significant at the level of 0.01%.

*Hypothesis H3* was confirmed, where we supposed that *qualifications of teachers for work with children from a socially disadvantaged environment increase the extent of cognitive functions development in their teaching style*. The teachers with required qualification for work with Romany pupils develop individual cognitive processes in Romany pupils more effectively, consciously, evenly, which is probably caused by their qualification for work with pupils from a socially disadvantaged environment (specifically with Romany pupils). Although the given data are in favour of the qualified teachers, we do not consider these results satisfactory in relation to teaching practice. Qualified teachers' values of individual items measuring development of cognitive processes in Romany pupils should be, in our opinion, higher (in kof3 to kof6).

## **Conclusions and possibilities for application of the research results in practice**

The study focuses on the teacher, his/her teaching style in relation to education of Romany pupils. There are several reasons for this. We are a part of the

EU and migration of the population increases. The school system should reflect this fact and improve curricula of individual education and training institutions participating in teacher training with ethnic, race, religious, social, multicultural and intercultural phenomena. The school system, enriched by the presence of children from different ethnic environments, requires training of a new generation of teachers – qualified professionals with professional competences oriented to education of pupils from a socially disadvantaged environment.

Based on the quantitative as well as qualitative analysis of the data we state that the research results bring significant arguments in favour of teacher training for work with groups of pupils coming from a socially disadvantaged environment.

Based on the results obtained, we can formulate ***recommendations in the theoretical, practical and methodological area***. We are aware of the limits of our research findings and we have no ambition to infer their general and complex validity.

We assume application of *the research in theory* due to the results bringing significant arguments in favour of children from a socially disadvantaged environment. Training of educators for work with children from a socially disadvantaged environment should guarantee acquisition of such professional competences and capabilities based on which a graduate will be able to identify the socio-cultural context of a pupil's development. This way he/she will additionally help the pupil to adapt to the environment of education and school conditions.

In our opinion, equally important for the theory of education is the knowledge, emphasised several times in our study, that a teacher qualified for work with Romany pupils should be a teacher with a completed higher education specialised in work with Romany pupils. Although completion of a generally focused teacher training programme for the primary stage entitles the teacher to work with such a specific group of pupils as Romany pupils, our research findings show that such a teacher has no competences required for work with Romany pupils coming from a socially disadvantaged environment.

We see the application of our research findings in the *methodology* in particular because we tested some methods in new conditions. We consider as important the observation of the teaching styles indices of teachers teaching Romany pupils. Their use is reasonable and possible also in such difficult conditions as the educational process in purely Romany classes as well as schools. We recommend increasing the proportionality of qualitative research especially when examining the relational plane authoritarian leadership of such subjective phenomena as the teacher's professional qualification and the related teaching style.

We see the *application of the research results* in many areas of *the teaching practice*:

- Look for ways of effective and quality teacher training for the process of education of pupils from a socially disadvantaged environment – specifically Romany pupils;
- organize the professional training process of future teachers for Romany pupils so that the teacher is able to reflect the cognitive as well as emotional stage of the Romany pupil's personality development;
- train teachers for Romany pupils in effective diagnostics of their psycho-physical and emotional needs, frustrations and barriers;
- purposefully, systematically and for the whole term of study: a teacher trainee should co-operate with an assigned teacher trainer in the given type of elementary school and be in permanent contact with the environment of the school attended by Romany pupils.

We realize that the solution of this problem is difficult. We believe that our research findings will be at least a small step to move the issue of teacher education for work with Romany pupils and eventually also the issue of effective education of children from a socially disadvantaged environment forward.

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## **The Role of ICT in School Management of Maldives**

### **Abstract**

One of the recent remarkable developments in education is the introduction of Information Communication Technology (ICT). The purpose of this research was to study the use of ICT in school management of Maldivian schools. Quantitative and qualitative methods are used in this study with a representative sample of school teachers/ teachers-supervisors and principals selected for the study. The findings of the research demonstrate that even though the facilities and equipment of ICT are available in some Maldivian schools, ICT is not used effectively in educational management of schools, rather they are used to some extent for daily administrative purposes of the school. The findings of the study will benefit the policy makers of developing countries, Ministry of Education, principals, teachers and other schooling education related personalities of the Maldives.

*Key words: role of ICT, education management, school policy, principals, teachers.*

### **1. Background**

Information Communication Technology (ICT) is a term that covers all forms of computer and communications equipment and software used to create, store, transmit, interpret, and manipulate information in its various formats (UQ, 2002). ICT is widely used on the entire globe for different purposes, including business, health, transport, communication, and education. The advancement in ICT ranging from electronic chips, mini computers, to large scale devices, has its impact on

every sector, and has crossed every nation in the world. Yet, the way they utilize it differs from country to country. The computer and Internet have integrated a lot in information and communication technology, leading to e-commerce, e-banking, e-government, e-learning, e-library and more.

Education systems try to inculcate ICT in its efficient ways to enable teachers and students to access and gain knowledge. Teaching and learning cannot happen as an analogy of spoon feeding knowledge at a given time. Therefore, ICT plays an enormous role in making teachers and students reach knowledge. Apart from pedagogy, ICT penetrated into the educational management in the system. The hierarchy in educational management from federal educational management to school management requires the latest technological advancements in planning, organizing, leading and controlling educational organizations. The relation between stakeholders and the school can be built through a better communication channel. Hence, ICT is the best tool for communication among them. The evaluation of input and output of the school is necessary for the future vision of the school. In the school, teachers are the fore-frontiers who need up-to-date information and skills for a better education of the coming generation. Hence, teachers need professional development in pedagogical knowledge and technology. In addition, financial and administrative executives in the school enhance organizing, leading and monitoring the academic and non-academic activities. In respect of all these mentioned, ICT is the key element in educational management in schools.

Maldives has moved out of the country boarder and has been globalised during the last few decades via ICT. The country is trying to use ICT in as many sectors, ranging from transport, communication, health, commercial transactions, sports, and more to social affairs. After 2001, the country has been in motion with information and communication technology through national ICT development plan. The dispersal of 200 inhabited islands widens the gap for technology use, however, a lack of infrastructure and man power in technology causes difficulties in bridging the gap. As far as the development of the country is concerned, the education system in Maldives introduces the latest technology and innovations in order to deliver the best education. The country has quite good telecommunication, and highly populated areas have quite good Internet facilities, including the capital city. It is believed that most of the schools in those islands have Information Technology resources, apart from small rural islands. Even then, it is unknown how many resources and facilities are utilized in schools and how the educational framework enhances ICT integrated teaching and learning. Moreover, how these facilities assist school management to enhance the quality of education. Hence, at the school level, the principal is the first manager to run the school under the

governance of school board, provincial educational board and the Ministry of Education. Thus, it is important to examine the role of principals in facilitating ICT for innovation in education.

### **1.1. Role of ICT in Maldivian school management**

Management is a continuous process through which members of an organization seek to co-ordinate their activities and utilize their resources in order to fulfill various tasks of the organization as efficiently as possible (Hoyle, 1981, as cited in Bush, 1995). According to Guthbert, (1984, as cited in Bush, 1995), management is an activity involving responsibility for getting things done through other people. Therefore, educational management is a field of study and practice concerning operational organisation (Bush, 2003). Moreover, educational management is defined as “an executive function for carrying out agreed policy” (Bolam, 1999, as cited in Bush, 2003). School management basically involves the classical functions of management: planning, organising, leading, and controlling (Williams, 2009), whereas planning means determining the school goals in relation to all the aspects of quality educational dimensions. Hence, it includes ICT and means of achieving them. Therefore, in this aspect, organising ICT involves deciding where decisions will be made, who will take part in ICT departments and facilitating ICT in other subjects within the school, and the role of teachers in implementing ICT in schools. Moreover, leading involves motivating and inspiring the use of ICT by students, teachers, support staff and parents. Finally, controlling means monitoring the progress through student and teacher evaluation by using ICT facilities.

As an education organisation is a complex system in which all the levels must cope with the decision making process, the development of ICT will enhance the educational institutions as an ICT policy has evolved into a strategic approach, in addition to being a means of stimulating and supporting the learning process, and the character of the ICT policy is therefore much more focused on understanding and describing ICT as an instrument that could be efficiently woven into both the learning process itself and the accompanying organisational and administrative procedures (Brummelhuis & Wijngaards, 2010).

The areas where more ICT-specific coverage is needed include personnel management, resource use and resource development management, financial and procurement management, planning and project management, managing sustainability, and monitoring and evaluation processes in management (Passey, 2002). All of these areas are necessarily used in school management. Therefore, physical ICT resources, necessary software, and ICT trained human resources are needed to perform these functions efficiently and effectively. To cope with such

changes, Information Technology has been used in some schools and education departments to support their routine operational, administrative and management process (Hsu, 1995). Practising paper work rather than using the information and communication technology will increase the burden and the system will always be lagging behind. Therefore, ICT is the key element for all these functions in the educational management in the world as well as in Maldives.

School management in Maldives has a hierarchical structure where the central Ministry of Education has primary control over management and administration. Recently, seven educational units were established in seven provinces, in order to overview schools within the province and facilitate the schools. However, this decentralisation concept is not effective, it plays a role of a mediator between schools and the central ministry. Moreover, each of these islands has a school or two, and all the islands are dispersed separately. Therefore, ICT is needed for connecting the schools and the province educational units and the central ministry. Likewise, ICT is used in the schools in several means, communication between teachers, students, and parents. Furthermore, ICT is also used between schools, province educational units and the Ministry. The Ministry of Education and educational support units have their own websites though which several documents can be downloaded, and also used as a means of sharing information. Few schools have their own websites, however, most of the schools use their e-mail to receive and send documents in administration daily routine. ICT is widely used in all sorts of instructional and administrative activities at different levels. In Maldives, like other sectors, educational management is also affected by Information Technology, where teachers, educational administrators and experts, who are using IT tools at present, have become more capable, more reliable, and their working style has changed (Shrestha, 1995).

## **1.2. Research aim and objectives**

The aim of the study is to understand the role of Information and Communication Technology (ICT) in school management in Maldives. In order to achieve this aim, the study has considered the following objectives;

- To understand ICT policy awareness and its implementation in Maldivian schools and differences in school routine based on pedagogical and co-curricular activities
- To understand how well teachers and principals of Maldivian schools utilize the efficiency and capacity of ICT in school management and administration.

#### **1.4. Research Questions**

The following questions were to be answered in the research:

1. To what extent do teachers and principals have knowledge and technical skills in different areas of ICT in Maldivian schools?
2. To what extent is ICT used in school management and administration in relation with ICT access, efficiency and capability in ICT skills, and use in financial and strategic management?
3. How equipped are Maldivian schools with ICT facilities and what is the teachers' access them it for pedagogical and learning activities?
4. How do teachers and principals of Maldivian schools use ICT in terms of communication, evaluation and monitoring of different necessary records?

## **2. Methods and methodology**

### **2.1. Research Methodology**

Quantitative and qualitative methods were used in this research. Qualitative methods allowed interviewees to express their views in a free environment. Semi-structured interviews were held with three principals with a qualitative approach and questionnaires were filled by 26 different teachers/leading teachers with a quantitative approach.

### **2.2. Sampling**

Since this research concerns the role of ICT in Maldivian school management, we selected teachers, leading teachers and school principals from Maldives, studying to obtain a Master's degree in Educational Management Programme in 2010 at the University of Malaya, Malaysia. The teachers were selected based on their merit, experience and qualifications from all over Maldives. As all these teachers were selected for pursuing higher education in Malaysia, and they had worked in school management as leading teachers from different regions of Maldives, the researchers considered them as a proper sample that represents the whole Maldives. There were 26 teachers/leading teachers on the list and 3 principals who had worked as principals for 2 to 8 years before they went to university. Thus, 26 teachers/leading teachers filled in the questionnaire for this research.

As mentioned earlier, there were only 3 principals in the Master's programme at the University of Malaya who were from Maldives. Therefore, these principals were included in the research as it required heads of schools' opinions.

## **2.3. Research instrument**

### **2.3.1. Questionnaire**

A questionnaire is a self-report instrument useful for economical and fast obtaining data from a large number of respondents (Brown, 2001). Questionnaires can be used to obtain both qualitative and quantitative data. The questionnaire used for this study was quantitative, as it contained close-ended questions along with some open-ended question to elaborate their answers. The questionnaire aimed to obtain information basically on aspects such as knowledge and technical skills of teachers and leading teachers and principals, availability of IT resources and ICTs accessibility and, efficiency and capacity of staff and use of ICT in managerial tasks

### **2.3.2. Interview**

The exact wording of basic questions was predetermined and all the interviewees were asked the same questions in the same order. The purpose of the research had been explained before the interview began. The principals were assured of the confidentiality of the interview, so that they could answer the questions freely and comfortably. Each of these interviews lasted for about 20 to 30 minutes and the interview was recorded using a digital recorder, with their permission. Later we filled in the interview forms to make them easily accessible for reference.

## **2.4. Instruments: Validity and reliability**

Two types of research tools were developed (questionnaire and interview) in order to obtain information to reach the research objectives. The opinion of our lecturer was sincerely considered before conducting this research. This research was based on 25 questionnaires and 3 interview forms. The participants were not only teachers/leading teachers but also principals who had worked in the schools for the past years, so this research covered most of the aspects of ICT use in Maldivian schools.

## **2.5. Documental Reviews**

The documents we reviewed including National Developmental Plan of Maldives 2006–2010, National ICT policy of Maldives, Ministry of Education's 'One Laptop for Each Teacher' policy and National curriculum of Maldives. Besides, a number of text books were reviewed to materialize this research.

### **3. Findings and discussion**

The purpose of the study was to analyze the use of ICT in the management of Maldivian schools, and its influence on school principals and other managers, and on their work conditions.

#### **3.1. Knowledge and technical skills**

Figures 1 and 2 show that school staff had acquired the basic skills of using IT and ICT in school daily administrative and management work. However, advanced IT equipment and ICT facilities, like smart board, is not used by educators, ICT is not commonly used in teaching and learning and for management purposes. Thus, there is a basis for this assumption for a valid reason. The resources available in Maldivian schools do not have smart boards in most of the schools (5 out of 26 schools have smart boards; the graph shows eight schools, however, as 5 of them represent 1 school, the number of schools having smart boards is 5 ). Therefore, as these ICT facilities are not common in schools, educators are not aware of the use of these kinds of advanced ICT facilities.

Therefore, the knowledge and skills of the staff in the Maldivian schools need to be evaluated further and it is obvious that this research has revealed a correlation of this human resource power in terms of knowledge and skills as a strong one because of the sample participating in this research, and hence the sample has educational background with a Bachelor's degree and 54% have received ICT training of some kind. However, it is interesting that their expertise and skills are not integrated in educational management or for teaching/classroom purposes. Rather they are used for daily administrative purposes.

#### **3.2. Resources and access to ICT facilities.**

One finding of the research related to resources and access of ICT facilities in Maldivian schools is represented in Figure 3. The Figure shows that all the schools that participated in the research are equipped with ICT facilities such as radio/cassette players, desktop computers and printers. Likewise, 24 schools have photocopy machines and scanners while multimedia projectors are available in 23 schools. Besides, 18 schools are equipped with video cameras, overhead projectors and laptops. Unlike these facilities that are widely used for teaching and learning and for administrative work on daily basis, ICT facilities such as interactive boards or smart boards and digital notice boards are not available in most of the schools. Hence, out of 26 schools only five schools have interactive boards.

The findings shown in Figure 3 reveal that the types of facilities that are widely used in schools are services that are needed for daily administrative purposes of the school and those of teaching and learning. In this regard, the facilities that are mostly available in the schools are computers, photocopy machines and thus these are needed for daily teaching and learning and for administrative work. Another finding related to the question of resources and access to ICT is the allotted budget for financing the school. Surprisingly, 23% of the schools have a budget for financing and implementing ICT in schools and indeed these schools are autonomous schools. Therefore, the decision of policy makers or the role of the Ministry of Education in terms of encouraging and facilitating ICT in schools is another area of study.

Thus, the findings in Figure 4 show that in Maldivian schools ICT is used for administrative work as the location of ICT facilities available and the location where people use them are quite similar. On the other hand, the use of ICT for classroom purposes is smaller and teachers use ICT in other places more than in the classroom, which proves that teachers do not integrate ICT in teaching as the curriculum is not integrated with ICT. Textbooks do not deploy lessons of ICT; therefore, teachers do not integrate ICT in teaching. Moreover, this finding supports the finding of the most common resources or ICT facilities available in schools. With regard to the discussion topic, the research explains that Maldivian schools are equipped with ICT facilities that are needed for daily administrative work and this equipment is available mostly in administrative offices and staffrooms, hence they are used for administrative purposes and not for educational management functions as there is no 'set up' that enhances the use of ICT in Maldivian schools in educational management.

### 3.3. Use of ICT in school

Figure 5 shows that the most usual purposes include ICT for administrating tests, preparing report cards of students, preparing lesson plans and learning for enrichment (21 teachers) as well as for accessing information. On the other hand, ICT is least used for developing logical and reasoning skills in students (8 teachers) and the second least include regular instruction and training for developing computer skills and remedial learning (11 teachers in both cases). Another finding is that a large number of teachers (18 teachers) use ICT facilities for playing games and for having fun. Consequently, the same number of people use ICT for helping with school and administrative work. A similar pattern is observed in the area of the frequency of ICT use in the schools. Once again, the most frequent use is preparing report cards (60% and it has been rated as very often), finding and

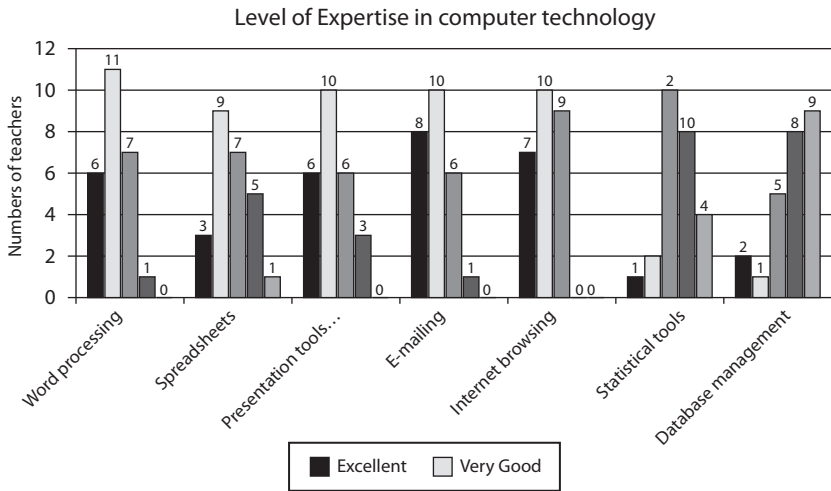


Figure 1. Level of expertise of teachers/ leading teachers in using computer technology.

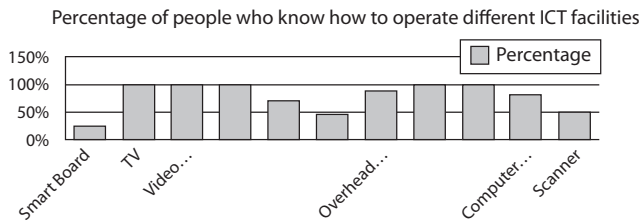


Figure 2. Percentage of people who know how to operate different ICT related facilities

accessing information (56% rated as very often) and monitoring students as well as for personal development (both 48%). In contrast to these findings, ICT is never used for communicating either with parents (56% never) or students (44% never) and for teaching computer skills (40% never).

### 3.4. Interview findings

The findings of the interviews reveal that ICT is used in different tasks by the principals. Firstly, 33% of the principals use ICT in communication with staff, students and parents. Secondly, in terms of financial management and administra-

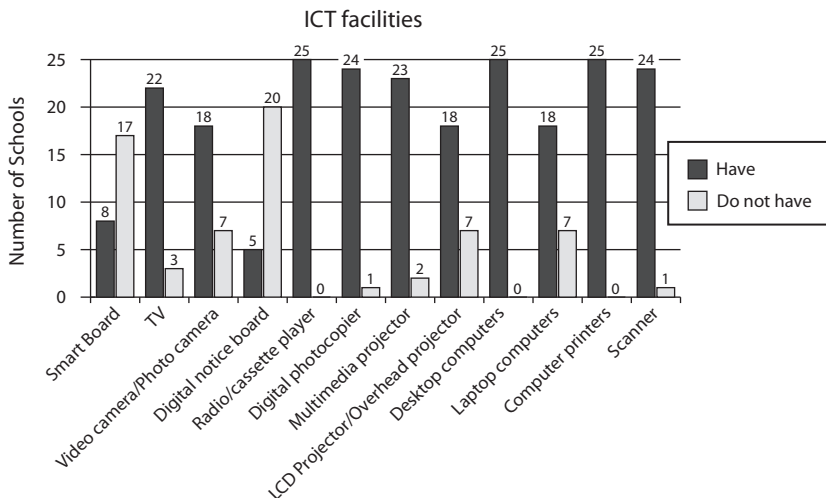


Figure 3. Availability of ICT facilities in the schools

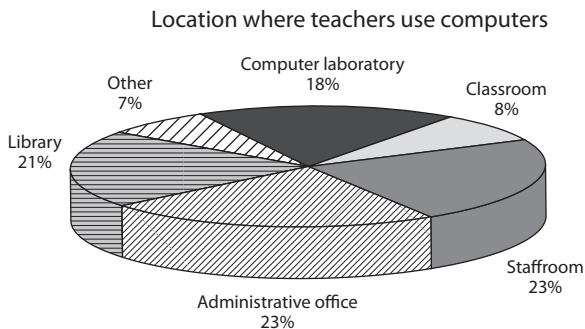


Figure 4. Locations where teachers use computers

tion, all the work related to financing is done using ICT. Hence, it was found out that these documents have to be shared with the Ministry and for this reason the documents are prepared using ICT. (One principal said that ICT is used to prepare sheets and send it to the Ministry). Finally, it was noted that other purposes or uses of ICT in schools by principals are similar to the purposes of teachers. These purposes include maintaining student records, performance analysis, monitoring

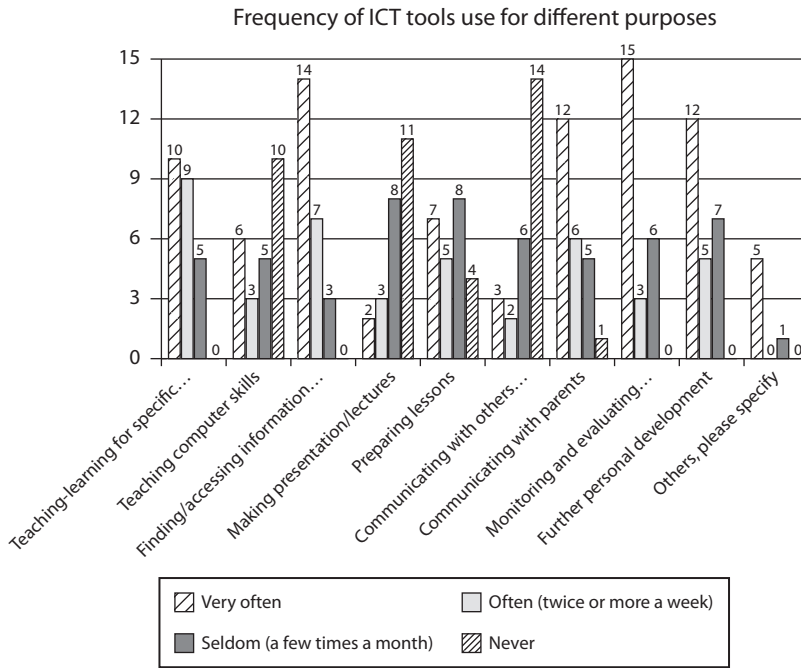


Figure 5. Frequency of ICT use for different purposes by teachers and leading teachers (middle-managers) in the school

and evaluating teachers and weekly record keeping. Transactions between schools and educational departments will be more direct and efficient, thus alleviating the manual collection and checking of necessary data and minimising the huge duplication of data on school teachers and students (Hsu, 1995). ICT can be used in schools in school management and administration; however, they are not definite on the ways how it can be used. There are several factors here. First of all, the principals who participated in this research do not have knowledge on educational management despite their limited knowledge on ICT from their teacher training period and knowledge gained from their work experience. Therefore, when one lacks the basic knowledge and technical skills it will be difficult to articulate the topic confidently. Besides, the principals are not obliged to implement ICT in schools as it is not included in their job description. Consequently, there are limitations or constraints that they face in schools. One fine example is that financial assistance is not provided to schools that are administered by the Ministry and even autonomous schools that allocate some budget for ICT may not have the effectiveness of providing and maintaining ICT for other reasons.

#### **4. Conclusion and recommendation**

Our findings show that ICT in Maldivian schools is not used for educational management purposes; rather it is used for daily administrative functions of the school. Furthermore, ICT is not used appropriately and effectively in schools and as the Ministry of Education do not have a policy for ICT, it is not being facilitated or supported in schools appropriately. Even though teachers have basic skills of using ICT, knowledge and technical skills in ICT and educational management are lacking in schools on the whole. Hence, schools do not have the efficiency and capacity for using ICT in educational management. Also, the results of this study indicate that ICT can be used in educational management by building the physical structure and equipping schools with ICT facilities and by providing training for human resources for the system.

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## Investigation of Pre-Service Teachers' Attitudes toward Using the Computer in Teaching and Learning Mathematics

### Abstract

The purpose of this study was to examine the attitudes of the pre-service teachers toward the use of the computer in mathematics classrooms. This study was conducted with 378 Turkish pre-service teachers (195 pre-service elementary school (PES) teachers, 183-pre-service mathematics (PM) teachers). Data were collected with an "Information Form for Computer Use" and a "Computer Attitude Scale for Teaching Mathematics" (CASTM). The CASTM consisted of fifteen 5-Likert scale type items and had 3 sub-factors. After the collection of quantitative data, the researchers used descriptive statistics and independent sample t-test in the analysis of the data. Results showed that there was a significant difference in the pre-service teacher' attitudes and confidence towards the CASTM in terms of gender. It was also determined that the PM teachers' attitudes and their confidence towards the computer were significantly higher than the PES teachers.

**Key words:** *pre-service teachers, mathematics, computer attitude, use of computer, gender, branch.*

### 1. Introduction

In modern civilization and the school system, the computer and technology are integral parts of our daily work, lives and education. Therefore, computers have been used in teaching and learning mathematics for more than three decades. Students use computers to study and to do homework, while teachers may use

them to prepare classes, create worksheets, to teach, etc. The use of the computer in mathematics classes has increased extensively during the past decades in the world, and particularly in Turkey. The new Turkish elementary mathematics curriculum emphasizes the importance of technology and teachers are expected to be more efficient in using computers in teaching and learning mathematics (MoNE, 2005). Similarly, the National Council of Teachers of Mathematics (NCTM, 2000) reported that computers are essential tools for teaching, learning and doing mathematics. Computers also furnish visual images of mathematical ideas and facilitate the organization and analysis of data and they compute efficiently and accurately (NCTM, 2000). Therefore, computer-assisted instruction (CAI) plays an important role in the teaching and learning of mathematical concepts (Baki, 2000). Moreover, research has shown that the use of technology plays a prominent role in teaching and learning mathematics and has a positive impact on students' motivation and achievements in mathematics (Lin, 2008; Vale & Leder, 2004), and computers are more influential than traditional teaching methods in mathematics learning (Isikal & Askar, 2005; Mistretta, 2005; Gürbüz, Çatlıoğlu, Birgin, & Toprak, 2009). However, using the computer in the classroom is affected by numerous factors, such as teachers' computer attitudes, degree of technological practice in the classroom, the teacher's teaching experience (Duru, 2011; Hsu, Wu & Hwang, 2007; Marcinkiewicz, 1994; Sadık, 2006). Therefore, teachers' attitudes play an important role in using technology and the computer in teaching and learning mathematics since teachers can be either supporters or obstacles in the process.

Research has examined pre – and in-service teachers' attitudes, experiences and the frequency of the use of the computer in mathematics classrooms (Birgin, Çatlıoğlu, Gürbüz, & Aydın, 2010; Hazzan, 2003; Lin, 2008; McAlister, Dunn & Quinn, 2005; Teo, Chai, Hung & Lee, 2008; Wang, 2001). Moreover, researchers have investigated attitudes toward the use of the computer according to gender. Some of them (Badagliacco, 1990; Duru, Peker, & Akçakın, 2010; Pierce, Stacey & Barkatsas, 2007; Sadık, 2006; Schumacher & Morahan-Martin, 2001; Vale & Leder, 2004) revealed significant gender differences. For instance, Sadık (2006) noticed that Egyptian male teachers had more positive computer attitudes than female teachers. Vale and Leder (2004) found that middle school boys' attitudes were more positive than girls' towards computer-based mathematics. In contrast, some research revealed no significant differences according to gender (Birgin et al., 2009; Birgin, Çatlıoğlu, & Çoker, 2010; Pierce et al., 2007; Vale & Leder, 2004; Pamuk & Peker, 2009; Ursini & Sanchez, 2008; Walters & Necessary, 1996). Therefore, findings regarding gender differences in attitudes toward computer-based mathematics are not clear.

On the other hand, some research showed that there was a relationship between teachers' beliefs and attitudes toward the use of computers in the classroom (Hsu, Wu, & Hwang, 2007; Henry & Clements, 1999; Marcinkiewicz, 1994). Since pre-service teachers are also considered as future educational leaders, it is important to understand pre-service teachers' attitudes towards using computers in learning and teaching of mathematics. For that reason, the aim of this study was to examine the pre-service elementary school (PES) teachers and pre-service mathematics (PM) teachers' attitudes toward the use of computers in teaching and learning mathematics. The following research questions were answered in this study:

- a) What is the profile of pre-service teachers' computer experience, frequency and purpose of computer use, and overall attitudes towards the use of computers in teaching mathematics?
- b) Do pre-service teachers' attitudes towards the use of computers in teaching mathematics differ according to gender and their branch (PES teachers and PM teachers)?

## **2. Method**

### **2.1. Participants**

The participants of the study consisted of 378 Turkish pre-service teachers. There was a total of 195 (51.6%) PES teachers, 183 (48.4%) PM teachers enrolled in teacher education programs in two different universities in Turkey. There were 182 (48.1%) males and 196 (51.9%) females, ranging in age from 19 to 24. The participants took Computer-I and Computer-II courses. Those courses mainly consisted of data processing technologies; basic concepts for software and hardware; general operating systems; word-processing software; spreadsheet programs; presentation of data; using the internet in education; effects of data processing technologies on the social structure and their position in education; security of data processing systems, ethical concepts and computer assisted instruction design. Besides, the PM teachers in this study also took a computer-assisted mathematics teaching course as a selected course.

### **2.2. Instruments**

In this study, the "*Information Form for Computer Use*" and the "*Computer Attitude Scale towards Teaching Mathematics (CASTM)*" were used. The "Information Form" was developed to aggregate personal data on pre-service teachers and their levels of computer use. This form includes questions about gender, branch, frequency and purpose of computer use, and computer experience.

In this study, the CASTM was used to measure the pre-service teachers' attitudes towards computer use in teaching mathematics. The original version of the CASTM developed by McAlister et al. (2005) consisted of 15 items and three sub-scales (Tool for Teaching, Confidence, and College Support). The CASTM included a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strong agree). The CASTM was modified into Turkish by researchers. In this context, the validity and reliability of the CASTM were conducted with 378 Turkish pre-service teachers. Two mathematics educators and an instructor at the department of Foreign Languages edited the original forms and the Turkish modification of the instrument items used in this study. In this study, the Kaiser-Meyer-Olkin (KMO) value of the scale was 0.82, and the result of Bartlett's test of sphericity was found as 678.49 for the scale ( $p < .01$ ). Because of this, it was found out that the data were suitable for factor analysis (Büyüköztürk, 2003). In order to determine the structural validity of the scale, an exploratory factor analysis (EFA) was applied. In order to determine the structure validity of the scale, a factor-analysis was conducted with a *principal components analysis* and a varimax orthogonal rotation process. In the factor analysis, the items with a factor load value higher than 0.45 were taken. It was determined that the items of the scale were clustered under three factors and explained 63.7% of the total variance. The sub-factors of the scale were similar to those of McAlister et al. (2005). Therefore, the sub-factors were named as Tool for Teaching (TT), Confidence (C), (3) College Support (CS). The reliability coefficient (Cronbach's Alpha) sub-scale of the CASTM was .89 (TT), .80 (C), .90 (CS), and .92 (CASTM) respectively. These values are similar to Cronbach's alpha values of McAlister et al. (2005). These values ( $> 0.70$ ) showed that the measurements were reliable.

### 2.3. Procedure and Data Analysis

There was no time limitation for the testing session, however the majority of the pre-service teachers finished the questionnaire within 20 minutes. Each item in the scale consisted of a 5-point Likert-type scale scored from 1 to 5. Data were analyzed with the SPSS 17.0 software program. Descriptive statistics and independent samples *t*-test and one-way ANOVA techniques were employed to determine the pre-service teachers' attitudes towards using computers in mathematics classrooms.

### 3. Findings

#### 3.1. What is the profile of the pre-service teachers' computer experience, frequency and purpose of computer use, and overall attitudes towards computer use in teaching mathematics?

As seen in Table 1, while 22.5% of the pre-service teachers used computers in elementary school, 31.2% of the pre-service teachers used them in secondary school. Unfortunately, about half of them (46.3%) used the computer in their university education. It was also determined that about one third of the pre-service teachers (32.0%) used the computer frequently for educational purposes, the majority of the participants (53.4%) used computers several times each semester, and 14.6 % of them used the computers a few times or less for educational purposes. As seen in Table 1, more than half of the pre-service teachers (53.4 %) used the computers for e-mails and Internet purposes, 25.4 % of them used computers for word processing and spreadsheet, 19.8 % of them used computers for other research purposes. However, a few pre-service teachers (1.3%) used computers for programming.

**Table 1.** The percentages related to experiences, purpose and frequency of computer use

First use of computer in education process	f	%	Frequency of computer use in the education process	f	%
Elementary School	85	22.5	Every week	121	32.0
Secondary School	118	31.2	Several times each semester	202	53.4
University	175	46.3	A few times or less a semester	55	14.6
Purpose of computer use			f	%	
E-mails and the Internet			202	53.4	
Word processing and spreadsheet			96	25.4	
Other research purposes			75	19.8	
Programming			5	1.3	

In this study, it was determined that while the pre-service teachers' attitudes related to the Tool for Teaching subscale ( $M = 3.69$ ,  $SD = .89$ ) were positive, their attitudes related to the Confidence ( $M = 3.22$ ,  $SD = .66$ ), College Support subscales ( $M = 3.19$ ,  $SD = .98$ ) and overall scale ( $M = 3.38$ ,  $SD = .67$ ) were neutral. Therefore, it can be said that the pre-service teachers' attitudes towards using computers in teaching mathematics were mostly positive except the Computer Support subscale.

### 3.2. Do the pre-service teachers' attitudes towards the use of computers in teaching mathematics differ according to gender and their branch (PES teacher and PM teacher)?

As seen in Table 2, there was no significant difference in the pre-service teachers' attitudes in the Tool for Teaching [ $t(376) = 1.915, p > .05$ ] and College Support [ $t(376) = 0.066, p > .05$ ] subscales according to gender. However, it was determined that there were significant differences in the pre-service teachers' attitudes related to the Confidence subscale [ $t(376) = 2.655, p < .01$ ] and overall scale [ $t(376) = 2.260, p < .05$ ] according to gender. In other words, the male pre-service teachers had more confidence than the female ones in the use of computers in mathematics teaching, and their attitudes towards the use of computers in mathematics teaching were more positive than the female teachers'.

**Table 2.** Results of the independent samples t-test according to gender

Subscale of the Scale	Gender	n	M	SD	t
Tool for Teaching (TT)	Male	182	3.77	.89	1.915
	Female	196	3.59	.88	
Confidence (C)	Male	182	3.31	.69	2.655**
	Female	196	3.13	.62	
College Support (CS)	Male	182	3.19	.96	0.066
	Female	196	3.19	1.01	
Overall Scale	Male	182	3.46	.68	2.260*
	Female	196	3.30	.63	

\* $p < .05$ , \*\* $p < .01$

As seen in Table 3, there was a significant difference between the pre-service mathematics (PM) teachers' and pre-service elementary school (PES) teachers' attitudes related to overall scale [ $t(376) = 2.120, p < .05$ ] in favor of the PM teachers. It was also determined that there was a significant difference between the PM teachers' and the PES teachers' attitudes related to the Confidence [ $t(376) = 1.996, p < .05$ ] and College Support subscales [ $t(376) = 2.712, p < .01$ ] in favor of the PM teachers. Namely, it can be said that the PM teachers had more confidence and college support than the PES teachers, and their attitudes towards the use of computers in mathematics teaching were more positive than those of the PES teachers. However, it was found that there was no significant difference between the PM teachers' and the PES teachers' attitudes related to the Tool for Teaching subscale [ $t(376) = 1.144, p > .05$ ]. In other words, the PM teachers' and the PES

teachers' attitudes towards the use of the computer as a tool in teaching mathematics were positive and similar.

**Table 3.** Results of the independent samples t-test according to branch

Subscale of the Scale	Branch	n	M	SD	t
Tool for Teaching (TT)	PM teacher	182	3.74	.95	1.144
	PES teacher	196	3.63	.83	
Confidence (C)	PM teacher	182	3.29	.71	1.996*
	PES teacher	196	3.16	.62	
College Support (CS)	PM teacher	182	3.33	.99	2.712**
	PES teacher	196	3.06	.95	
Overall Scale	PM teacher	182	3.46	.71	2.120*
	PES teacher	196	3.31	.61	

\* $p < .05$ , \*\* $p < .01$ , PM: Primary mathematics, PES: Primary elementary school

#### **4. Discussion and Conclusion**

This study investigated the pre-service teachers' attitudes toward the use of the computer in teaching mathematics. This study revealed that about half of the pre-service teachers used the computer first in their university education and many of them used computers for e-mails and internet purposes, and also the majority of them used computers a few times each semester for educational purposes. Since Turkey is a developing country, computer technology was too expensive until the last ten years, low-income families could not buy a computer for themselves. For this reason, many pre-service teachers in our sample have encountered the computer in their education process and the use of computer in classrooms has recently become widespread.

In this study, it was determined that the pre-service teachers' overall attitudes towards the use of the computer in mathematics were positive. Similarly, the findings of the previous research showed that the pre and in-service teachers had positive attitudes towards using computers in education (Birgin et al., 2009; Duru, 2011; Hazzan, 2003; Lin, 2008; Teo et al., 2008). But the pre-service teachers were not confident about the use of the computer in mathematics classrooms. This may result from the fact that the frequency of the use of computers in the education process is not sufficient, since the majority of the pre-service teachers use the computers a few times each semester for education purposes. Another reason which

affects these attitudes can be rare use of the computer for a long time. Because about half of the pre-service teachers stated that they began using the computer in their higher education. This study has found out that in recent years there has been a sharp rise in computer ownership among college and university students in Turkey, which is a developing country between Europe and Asia (Goktas et al., 2009). These results can be explained by the recent increase in computer use in every field in Turkey and the cost effectiveness of computer ownership.

This study revealed that there was a significant difference in the pre-service teachers' computer attitudes according to gender. This study determined that the male pre-service teachers had more positive attitudes towards using computers in teaching mathematics and had higher confidence in the use of the computer than the females. This result aligns with the results of some research (Badagliacco, 1990; Duru, 2011; Schumacher & Morahan-Martin, 2001; Sadık, 2006; Vale & Leder, 2004). In Turkey, the use of computers has recently become widespread at home. In the past, people used to go to internet cafes to use computers. But some families either prevent their girls from going to internet cafes at the right time or they do not send them to internet cafes at all. Therefore, girls begin to use the computer later. In this context, the recent research results in Turkey (Birgin et al., 2010a; Tahiroglu et al., 2008) showed that although Turkish females use computers more at home, males use computers more at internet cafes. So, it could be concluded that the male pre-service teachers have more experience than the females. Since some research stated that the experiences in the use of computers affected the attitudes towards the computer (Birgin et al., 2009; Duru et al., 2010; Ursini & Sanchez, 2008), this may be the reason for the gender related differences in attitudes and confidence.

In this study, it was found that the PM teachers had more confidence and college support than the PES teachers, and their attitudes towards the use of computers in teaching mathematics were significantly higher than those of the PES teachers. While the PM teachers in this study took the computer-assisted mathematics teaching course, the PES teachers did not take it. So, the PM teachers found more opportunities to use computers in mathematics learning. This may be the reason for the difference between the PES teachers' and the PM teachers' attitudes toward using computer in mathematics. Similarly, some researchers (Al-Khaldi & Al-Jabri, 1998; Birgin et al., 2010b; McAlister et al., 2005) reported that attending a CAI course had a positive effect on computer attitudes. Baki (2000) also emphasized that computer-assisted instruction (CAI) experience played an important role in helping PSM teachers to design the learning environments of the future. For this reason, we conclude that assuring that pre-service teachers have such experiences

during their pre-service education may contribute to their positive attitudes towards computers in their future professions.

## **5. Implications & recommendation**

The present study has significant implications for the question often asked by researchers related to pre-service teachers' attitudes towards using computers in mathematics, which affect the use of computers in the classroom. Firstly, teacher education programs should provide pre-service teachers with supportive educational experiences in the successful use of computers in learning and teaching mathematics, and computer-based instruction should be made compulsory for students at faculties of education. According to the findings of the present study, it can be seen that in order for the integration of the computer in the mathematics classroom to become a reality, positive and sustained leadership is needed. Therefore, teacher mentors should be a model to pre-service teachers about the integration of computers in the mathematics classroom, at university, and pre-service teachers must be encouraged to use computers in their future classroom.

This study on pre-service teachers' attitudes toward computer-based mathematics does not have a long history. Further research should be conducted on the relationships between teachers' attitudes towards computer-based mathematics and students' achievement, and pre-service teachers' and in-service teachers' attitudes towards computer-based mathematics should be compared. Also, research should be carried out on factors influencing teachers' attitudes towards computer-based mathematics.

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## **School Culture as the Predictor of Job Satisfaction with Respect to Teachers' Perceptions: A Causal Study**

### **Abstract**

In this study, it was aimed to determine the school culture's effect on job satisfaction based on primary school teachers' perceptions. The sample of this study was composed of 291 teachers working in 10 primary schools located in Erzurum city center. The sample was chosen by means of the maximum variation method. The data for this study was gathered with the help of School Culture and Job Satisfaction Scales. In the data analysis, Pearson Product Moment Correlation and Multiple Linear Regression analyses were used. The findings of this study revealed that there was a positive correlation between school culture and job satisfaction according to teachers' perceptions. In addition, the school culture was statistically determined to be an important predictor variable of job satisfaction.

**Key words:** *school culture, job satisfaction, teacher.*

### **Introduction**

Jobs are generally viewed from sociological, psychological, economic and ethical perspectives. However, the teaching profession is affected by all of these dimensions and it involves more or less some parts from all of these dimensions. This perspective shows that the teaching profession can be affected many alterations in social life (Karikova, 2010).

People's jobs have a great influence on their lives. They take a large portion of time in their lives. In addition, since people's jobs also influence their lifestyles,

they should be interesting for them and should contribute to individual satisfaction (Tsigilis, Zachopoulou & Grammatikopoulos, 2006).

Although there are various definitions for job satisfaction, the satisfaction that employees get from their jobs is generally defined as how people perceive their jobs and different aspects of their jobs. In other words, satisfaction is individuals' general attitudes towards their jobs when they encounter different situations related to their jobs (Spector, 1997).

Job satisfaction is considered to be the result of success, unconscious interest towards the job, responsibility and improvement. These five factors are conceptually and experimentally very much related to each other. When providing these factors in any job areas, the employees' performance increases, as well as they develop positive feelings towards their jobs. In addition, providing these factors contribute to satisfying individuals' basic needs in the work environment. It is argued that individuals' basic needs, individual development and self-actualization are highly related to each other. Instead of job satisfaction, the source of job dissatisfaction comes from all the characteristics of the activities applied for the job. Some of these characteristics are organization policy, administration applications, and relations among individuals (Miner, 2006).

From the perspective of education organizations, whose central factor is a human being, each school constructs its own culture with the experiences and mutual interactions of its occupational groups of employees (Balcu, 2007; Marzano, Waters & McNulty, 2005). Dobrowolska (2010) stated that the dimensions that first come to mind when teachers' school culture is mentioned are relations among individuals, effective interactions and sharing experiences.

Organizational culture is the whole of shared tendencies that keeps the employees together and that makes the employees gain characteristic identity. It provides them with information about organizational purposes, sharing power and authority, communication types and world viewpoints. Main study areas about organizations were based on systems' effective sincerity, trust, cooperation, equality, and novelty in common culture (Hoy & Miskel, 2010; Şimşek & Fidan, 2005).

While organizational culture is a phenomenon that is completely related to its existence, job satisfaction, on the other hand, is related to employees' individual satisfaction from their job in the cultural structure they involve (Türkoğlu, 2008). Although there are lots of factors that affect employees' satisfaction from their jobs in organizations, especially the necessary value that should be given to employees as human beings, positive communication among the employees with the same or different status, and opportunities for professional development are the most

important factors for it (Aydın, 2008). If employees feel organizational support, they will be more involved in their job and their motivation will increase. Therefore, they will get more satisfaction from their jobs (Keser, 2006).

The relations among employees are generally based on the relations with authorities (Minibaş-Poussard, 2002). Therefore, having similar cognitive structure with the work group, being accepted by them and cooperation with them influence job satisfaction in a positive way (Silah, 2000).

Employees' expectations may differ from each other. For some employees, social status in society is of the most importance, while others expect a job with a higher salary. If an organization tends to make decisions in a democratic manner, i.e. if the employees take an active role in the decision-making process, the importance of the salary factor may diminish among them. Some other employees may give priority to reputation and respectability of the organization they work for rather than salary. From this point of view, employees' expectations and preferences become more important in their potential behaviors in the organization (Kakabadse, Bank & Vinnicombe, 2004).

In the organizations like schools, meeting teachers' expectations is more important than their financial needs (Çelik, 2002). Steers and Porter (1979) stated in their study that the needs with the highest degree that individuals have to satisfy are respect to themselves, social and individual relations. From this perspective, this study aimed to determine to what degree the sub-dimensions of perceived school culture by teachers (collaborative leadership, teacher collaboration, professional developments, unity of purpose, collegial support) predict their satisfaction.

## **Method**

### **Design**

This study was conducted with a causal design in order to investigate to what degree the school culture factors, including collaborative leadership, teacher collaboration, professional development, unity of purpose and collegial support, predict job satisfaction from the perceptions of teachers working in primary schools. Causal design is a kind of research design that investigates the cause-effect relations which occur or already exist among some variables. When it is assumed that the relation among the variables is a cause-effect relation, a causal research design is used (Karadağ, 2009). Taking it into account, school culture is a dependent variable, while job satisfaction is an independent variable.

### **Target Population and Sample**

The target population of this study was composed of primary school teachers working in the primary schools in Erzurum city center during the 2010–2011 school year. In addition, the sample of this study was composed of 291 teachers of 10 primary schools located in the city center. The sample was chosen according to the maximum variation method. The purpose of this sampling method was to determine whether there were common or shared phenomena among the situations that showed variations and to reflect individual variations to the maximum degree that could be a part of the problem by constructing smaller sampling groups (Yıldırım & Şimşek, 2006).

48.1% of the research sample were male while 51.9% were female. In addition, 49.1% of them were primary school teachers while 50.1% of them were from other disciplines such as mathematics, science, languages. Teaching experience ranged from 1 year to more than 21 years in this study. 22.3% of the teachers participating in this study had 1–5 years of teaching experience, 22.3% of them had 6–10 years of teaching experience, 28.5% of them had 11–15 years of teaching experience, 26.8% of them had 16–20 years of teaching experience and 11.7% of them had more than 21 years of teaching experience.

### **Data Collection Tools**

**School Culture Scale:** The School Culture Scale which includes 27 items and five sub-dimensions (collaborative leadership, teacher collaboration, professional development, unity of purpose, occupational support) was used in this study. The first version of this scale was developed by Gruenert and Valentina (Gruenert, 2000). The scale was translated into Turkish by Demirtaş (2010) by doing its validity and reliability study. This scale was a five-point Likert type scale with the items (1) I strongly disagree, (2) I disagree, (3) I moderately agree, (4) I very much agree (5) I strongly agree. The reliability of each factor was calculated and Cronbach's Alpha values (First factor: .89; second factor: .68; third factor: .73; fourth factor: .72 and fifth factor: .76) were found.

**Job Satisfaction Scale:** To determine the teachers' job satisfaction, a Likert type "Job Satisfaction Scale" including 20 propositions was used. The "Job Satisfaction Scale" was composed of 20 items of the five-point Likert type. It included two sub-dimensions. These were "qualification eligibility," which included 13 items, and "development opportunity," which included 7 items. The internal consistency coefficient of this scale was .90 which was determined with the use of Cronbach's Alpha. The minimum score to gain from this scale was 20 points while the maximum score

was 100 points. The responses to items of this scale were “always”, “frequently”, “sometimes”, “merely” and “never”. The responses to each item were evaluated in one way from “always” with 5 points to “never” with 1 point. Obtaining a high score from this scale means higher job satisfaction (Kuzgun, Aydemir-Sevim & Hamamcı, 2005). The necessary permissions for each scale were gathered and the new calculations for this study are shown in Table 1.

**Table 1.** Reliability Coefficients, Means and Standard Deviations of Job Satisfaction and School Culture Scales

	Number of Items	Alpha	$\bar{X}$	SS	<i>n</i>
Job Satisfaction	20	.88	80.61	14.35	291
<b>School Culture</b>					
Collaborative Leadership	11	.90	35.90	8.51	291
Teacher Collaboration	3	.77	9.23	2.23	291
Professional Development	5	.76	17.57	3.46	291
Unity of purpose	4	.77	14.90	2.80	291
Collegial Support	4	.78	14.62	3.02	291

### Process

The data for this study were gathered by administering the School Culture and Job Satisfaction Scales to primary school teachers who were in the sample group in the 2010–2011 school year. The necessary time to fill in the scales was 20–25 minutes. The data gathered were analyzed in three phases. The detailed information for these phases is as follows:

(i) **First Phase:** Before analyzing the data statistically, the data collection tool which was administered to the primary school teachers was scored according to five-point Likert systems.

(ii) **Second Phase:** To determine the relation between the School Culture and Job Satisfaction Scale Scores, *Pearson Product Momentum Correlation Analysis* was used.

(iii) **Third Phase:** To determine the School Culture scores prediction level for the Job Satisfaction Scale scores, *Multiple Linear Regression Analysis* was used. In this analysis, school culture factors (collaborative leadership, teacher collaboration, professional development, unity of purpose, collegial support) were independent variables while job satisfaction was a dependent variable.

## Findings

### The Correlation Findings for the Relations between the Scores of Job Satisfaction and School Culture Sub-Factors

It was observed that there were positive relations between the primary school teachers' job satisfaction and school culture sub-factors which are collaborative leadership [ $r=.21$ ], teacher collaboration [ $r=.15$ ], professional development [ $r=.15$ ], unity of purpose [ $r=.13$ ] and collegial support [ $r=.12$ ].

**Table 2.** Correlation Matrix between Job Satisfaction and the Sub-Dimensions of School Culture

Variables	1	2	3	4	5	6
1 – Collaborative leadership	–					
2 – Teacher collaboration	.56**	–				
3 – Professional development	.59**	.67**	–			
4 – Unity of purpose	.69**	.51**	.71**	–		
5 – Collegial support	.62**	.58**	.76**	.72**	–	
6 – Job satisfaction	.21**	.15*	.15*	.13*	.12*	–

$\eta = 291$ , \*\* $p < .01$ , \* $p < .05$

### Multiple Regression Findings between the Scores of Job Satisfaction and School Culture Sub-Factors

Table 3 presents the results of the multiple variable linear regression analysis to evaluate the prediction power of scores of school culture perceived by the primary school teachers for the job satisfaction scores. To make the multiple variable linear regression analysis, there was a need to look at the VIF values of independent variables (school culture factors) to control possible multiple relations among the factors. Since the VIF values were between 1 and 5 ( $1 < \text{VIF} < 5$ ), it was concluded that there was no multiple relations among the variables (Özdamar, 2009). From the graphics gathered from error terms and independent variables diagrams of fallout, it was observed that error terms satisfied the requirement of the co-variance assumption. In addition, it was determined that Q-Q graphics distribution was normal distribution. The aim of looking at Q-Q graphics was to control error terms distribution which was determined as the difference between the dependent variable's (school culture) predicted and observed values.

In order to determine to what degree school culture perceived by the primary school teachers predicted their job satisfaction, the *Multiple Variable Linear Regression Analysis* was performed and statistical significance was found between them

[ $F_{(5, 285)}=2.810, p<.01$ ]. It was found that all the sub-factors of the School Culture Scale (collaborative leadership, teacher collaboration, professional development, unity of purpose and collegial support) could explain .047 % of the difference in the job satisfaction scores [ $R= .22, R^2=.047$ ]. These results can be interpreted as most of the difference in the job satisfaction scores can be explained with other variables. In addition, different from the other sub-factors, it was found that one of the sub-factors in the school culture, which was collaborative leadership, significantly predicted the job satisfaction alone [ $\beta=.212, t_{(5, 285)}=2.461, p<.05$ ].

**Table 3.** Multiple Variable Regression Matrix between Job Satisfaction and Sub-Dimensions of School Culture

School Culture	<i>B</i>	<i>SH<sub>B</sub></i>	<i>B</i>	<i>T</i>	<i>P</i>
Constant	67.939	4.806		14.136	.000
Collaborative Leadership	.357	.145	.212	2.461	.014
Teacher Collaboration	.219	.527	.034	.415	.678
Professional Development	.329	.434	.080	.759	.448
Unity of purpose	-.340	.508	-.067	-.670	.504
Collegial Support	-.197	.466	-.042	-.424	.672

$n=291, R=.22, R^2=.047, F=2.810, p<.01$

## Discussion

According to the primary school teachers' perceptions, it was found that there was a significantly positive relation between the sub-dimensions of school culture and their job satisfaction. In addition, the results of the multiple linear regression analysis indicated that school culture's sub-factors as a whole significantly predicted job satisfaction, but when compared to other factors, the collaborative leadership alone had prediction power on job satisfaction. Administrators want employees to have higher job satisfaction in organizations. Therefore, they strive for providing and increasing job satisfaction according to their opportunities and experiences. In order to provide and increase job satisfaction, which is one of the most important factors to reach individual and organizational purposes, first of all, there is a need to have detailed information about the factors that affect job satisfaction (Tengilimoğlu & Yiğit, 2005).

The literature indicates that job satisfaction is affected by sex, wage, expectations, the organization where employees work, work environment (Bishay, 1996; Cencirulo, 2001; Goetz, 2001; Rich, 2000; Sandbank, 2001; Wharton, Rotolo &

Bird, 2000). In addition, job satisfaction has a complex structure that changes from one person to another (Kakabadse, Bank & Vinnicombe, 2004). Therefore, the low level of relations obtained in the study can be attributed to the nature of the job satisfaction concept.

There are various studies that investigate the relation between leadership behavior and job satisfaction (Bilz, 2008; Bogler, 2001; Bratt, Broome, Kelber & Lostocco, 2000; Griffin, Patterson & West, 2001; Karadağ, Başaran & Korkmaz, 2009; Pool, 1997; Receptoğlu, 2008; Soonhee, 2002; Teas, 1983; Wisniewski, 1990). According to the Behavioral Management Theory for job satisfaction, it is important for administrators to show that they value their employees and to behave friendly towards them in the employer-employee relations (Başaran, 2000; Bingöl, 1997). Especially in organizations like schools, settlement of these kinds of behaviors has a positive effect on increasing teachers' job satisfaction (Çelik, 2002).

Another important variable that has an effect on job satisfaction is existing collaboration and sharing among employees. Employees' effective working conditions and their happiness at work can be satisfied with close relations among them. It is obvious that teachers' satisfaction from work will increase with the help of their positive support to each other in the work environment (Karahan, 2006).

Successful school administrators generally focus on the common vision and learning objectives in order to develop and sustain an effective and successful school environment (Gurr & Drysdale, 2005; Leithwood & Riehl, 2003; Lucas & Valentine, 2002). Common values and beliefs help teachers to share ideas with each other, to serve as a source of relief and support among them (Bishop & Scott, 1997). From this perspective, it can be asserted that teachers who have close relations with other teachers and who support each other in the school have a high level of job satisfaction (Kloep & Tarifa, 1994; Özkalp & Kirel, 2001; Rodgers-Jenkinson & Chapman, 1990). The results of the study and the literature indicate that school culture has an important effect on getting satisfaction from work. From the findings of this study, it can be recommended that administrators should make school related decisions including administrative activities together with teachers. In addition, in-service training seminars and applications can be organized to make all teachers show collaborative behaviors. Considering teachers' direct influence on students who are the future of the nations, there is a need to provide teachers with the opportunities that have a positive effect on their job satisfaction and to improve these opportunities for them.

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## **The Chances of People with Disabilities for Continuing Education and Opportunities of Employment in the Context of the Key Competences Level of Vocational School-leavers**

### **Abstract**

One of the main objectives focusing on the subject of disability is to create a situation which will enable people with disabilities to fully participate in all spheres of social activities. In Poland the issues of disability and disabled people have been present in the public debate for many years. However, the changes in the social as well as economic climate of life justify taking actions and their adjustment to reality, so as not to marginalise the issues of disability in terms of the state's responsibilities for its citizens. One of such actions is the professional insertion and employment of people with disabilities. The paper will tackle the above-mentioned problems.

*Key words: key competences, professional insertion, work, disability.*

### **Introduction**

At the beginning of the 1990s the first social campaigns concerning people with disabilities were launched in order to draw attention to the problems faced by them. For many years people with developmental disorders had stayed on the sidelines of the life of society, being unnoticed at the same time. Hidden in their houses, from which they often could not get out because of the existing physical barriers; "imprisoned" in special schools and supported-employment enterprises, they were living in a different, parallel world. Their problems were only known to a close circle of people like family members, teachers or therapists, and rarely

to their employers. Integration and normalising tendencies which became the motto of the world public campaigns at the end of the 20<sup>th</sup> century, contributed to the European and world debate on disability. People started paying attention not only to the limitations which accompany the problem of disability, but also to the latent potential which lies in persons with disabilities. Moreover, it marked the beginning of the process which has lasted till nowadays, aiming at involving people with developmental disorders in becoming part of society on equal rights, and in fostering their full participation in all possible areas of social activity.

One of such areas of social activity is one's presence on the labour market. Professional activity plays an analogous role in the lives of people with disabilities as in the lives of able people. However, there is also a very important factor – it is one of the most effective methods of rehabilitation. Despite many years of series of actions for the benefit of disabled people, their occupational situation and possibilities within this scope are still more difficult than for able people. What are the reasons for this? Are they conditioned, and to what extent, by external factors like forms and effects of education or social attitudes of no acceptance of otherness? And to what extent do they have the grounds in the attitudes of people with disabilities, in their motivation for achieving life plans and goals? These questions, in spite of the number of the conducted studies, still remain unanswered. Nevertheless, it is worth making an attempt to answer some of them.

## **Methodology**

The above analyses are being carried out in the context of the results of the studies done within the research project entitled: *Educational factors at the start and professional insertion of young disabled persons (based on the example of the Łódź province) [Edukacyjne uwarunkowania startu i aktywizacji zawodowej młodych osób niepełnosprawnych (na przykładzie województwa łódzkiego)]*, lasting from 19<sup>th</sup> September 2008 to 18<sup>th</sup> September 2011. The project was financially supported by the Ministry of Science and Higher Education within the 35<sup>th</sup> competition for research projects (Number N N106 067535).

One of the main objectives defined during the research was a diagnosis of educational factors determining career prospects of people with disabilities who complete vocational education. Within the frame of the main objective, there was formulated another specific objective which, among others, focused on establishing the level of primary competences of young people with disabilities finishing their education at the level of vocational school. Consequently, the research questions

stated within the formulated objective are: (1) What is the level of knowledge and general skills at which young people with disabilities finish their education?; (2) Do young people with disabilities acquiring vocational education differ from their able peers in terms of general competences?; (3) In which areas compared in the research are the biggest differences?

By answering the stated problem questions the author of this paper was indirectly looking for the answer to the question concerning the career prospects of people finishing education with qualifications for work, and the chances of their continuing education at further stages. These questions are crucial in the context of the indicators concerning participation of people with disabilities in the group of university students and graduates.

## **Participants**

The three groups of people with disabilities who took part in the research were: people with visual, hearing and intellectual impairment from the Łódź province. The subjects were schoolchildren who had finished education at the vocational level in special schools, basic vocational schools and secondary technical schools. The research group consisted of 130 people. The research also included able pupils (the control group) who, like people with disabilities, completed their education in vocational schools (basic vocational schools and technical secondary schools). The control group comprised 174 individuals. In total, 304 people participated in the research.

## **Context of research**

The data provided by the Office of the Government Plenipotentiary for Disabled People<sup>1</sup> show that there are differences in the educational level between able people and those with disabilities. People with developmental disorders receive basic vocational education more frequently than the able. It applies to the over 15 years of age group as well as to the working age group. In the latter category 40% (39.4%) of people with disabilities and fewer than 30% (27.4%) of able people received basic

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<sup>1</sup> Disability in Numbers [Niepełnosprawność w liczbach] (revised). (n.d.). Retrieved July 27, 2011, from the Office of the Government Plenipotentiary for Disabled People Web site: <http://www.niepelnosprawni.gov.pl/niepelnosprawnosc-w-liczbach/>

vocational education. Greater differences that are to the disadvantage of disabled people, concern secondary and higher education.

**Table 1.** Distribution of education in the group of able and disabled people in 2010 (the Office of the Government Plenipotentiary for Disabled People Website, 2011)

Level of education	Disabled persons		Able persons	
	Above 15 years old (%)	At working age	Over 15 years old (%)	At working age
Basic vocational	30.3	39.4	24.0	27.4
At least secondary	33.7	34.1	54.1	61.2
Higher	6.6	8.6	19.5	22.4

Only 34.1% of the people with disabilities at working age obtained at least secondary education in comparison to 61.2% of the able people. More visible disproportions appear during the analysis of higher education indicators. Almost three times more of the able people than the disabled at working age are holders of a university diploma. Obviously, a lack of education decreases the chances of professional activity, possibilities of getting, maintaining and choosing from the opportunities of realisation of career tasks. It seems to be a common rule: the higher the level of education, the bigger the rate of professional activity and employment.

In 2010 the rate of professional activity in the case of highly educated people with developmental disorders at working age was 48.9%, at the 43.8% employment rate. It implies that fewer than 50% of disabled people with higher education actively participated in the labour market. The chances of people with developmental disorders of getting employed decline sharply in the case of their secondary education. Only fewer than a third of them show activeness in looking for a job and a quarter get employed. What is more, the data paint a grim picture of professional activity and employment regarding the group of people with basic vocational education. The Office of the Government Plenipotentiary for Disabled People informs that professional activity was shown only by 20.8% of them, and barely 17.3%<sup>2</sup> got employed.

The indicators, especially in the latter group, of people with basic vocational education are alarming. It is obvious to ask: why are there only a few people with

<sup>2</sup> Disability in Numbers [Niepełnosprawność w liczbach] (revised). (n.d.). Retrieved July 27, 2011, from the Office of the Government Plenipotentiary for Disabled People Web site: <http://www.niepelnospawni.gov.pl/niepelnospawnosc-w-liczbach/>

disabilities who get employed after completing vocational education? Is it the result of a lack of posts for people with disabilities with vocational education? Are the specialisations of vocational education, offered for schoolchildren with developmental disorders, adjusted to the needs of the labour market? Or perhaps the competences and qualifications of people with disabilities are insufficient for employers.

### **Research results in the context of possibilities for continuing education and the chances of employment for people with disabilities**

Within the research project, number N N106 067535, supported from the funds of the Ministry of Science and Higher Education<sup>3</sup>, studies were conducted concerning, among others, the level of key competences of disabled people finishing vocational education. As a consequence, it was established that:

- people with disabilities (visually, hearing and intellectually impaired) show a low level of key competences. Average score received in tests by the subjects was less than 50% possible;
- an average result for the *reading comprehension* competence test was – 50.83%, for *logical thinking* – 46.8% and for *application of knowledge in practice* – 51.5%;
- in the *reading comprehension* competence test the people with visual impairment got – 44.5%, hearing impairment – 41.3%, and intellectual disability – 53.8%;
- in the *logical thinking* competence test the people with visual impairment scored – 40.8%, hearing impairment – 31.5%, intellectual disability – 56.8%;
- in the control group, which included able school-leavers with completed education at a vocational level, the level of competences (examined by a similar test) was significantly higher. An average result for the whole test was – 62.9%, out of possible ( $t=4.814$ ,  $p > 0.000$ ). In the *reading comprehension* competence test the subjects obtained the following results – 71.3% ( $t=7.369$ ,  $p > 0.000$ ), in *logical thinking* – 56.7% ( $t=2.942$ ,  $p>0.005$ ) and in *application of knowledge in practice* – 67.2% ( $t=4.960$ ,  $p>0.000$ ).

The results of the research reveal that people with disabilities show a low level of the following competences: *reading comprehension*, *thinking* and *application*

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<sup>3</sup> Project coordinator Iwona Chrzanowska

*of knowledge in practice*. Additionally, as it turned out they “lose” to their able peers. There is no doubt that it is one of the major reasons why such a big group of vocational school graduates with disabilities, previously mentioned, cannot find a job. On the basis of the analysis of the presented results, people with hearing impairment are in the least favourable situation. Their results are the lowest in comparison with the remaining two groups of people with disabilities. With a degree of astonishment, one should admit the scores obtained by people with intellectual disability, especially in the context of information that all the subjects (able people as well) did the same test. The tool<sup>4</sup> used in the research was specially designed for the aim of the project by the experts of the Regional Examination Board in Łódź. The competence of reading comprehension was tested on exactly the same text; the subjects were doing identical tasks so as to prove their abilities of logical thinking and applying knowledge in practice. Regardless of the proportionally high results of schoolchildren with intellectual disabilities, the research results of the whole group of people with disabilities revealed that there are little chances of continuing education which may lead to secondary or higher education. In the context of this group, one should, therefore, concentrate first of all on counteracting professional inactivity and on stimulating young people with vocational qualifications to look for work or a possibility of retraining in response to the offers of the labour market.

Without a doubt, the social and economic situation of a person or a social group is conditioned significantly by the situation on the labour market. The recent years, not only in the Polish economy, were marked as a particularly difficult period. Economic crisis translated into a decrease in the number of vacancies. In Poland people with disabilities were also affected by the situation. The social campaigns conducted over the last decades to promote professional activity of the disabled, as well as the law proposals, have led to the systematic increase in the rate of professional activity and employment of people with developmental disorders. In 2007 the professional activity rate of people with disabilities was – 22.6%, in 2008–23.9%, in 2009–24.6%, and in 2010 it rose to the level of 25.9%. The employment rate was on the increase as well. For the first time in 2008 it exceeded the level of 20% (20.8%), in 2009–21.4%, and at the end of 2010 (the data for the 4<sup>th</sup> quarter) it reached the level of 22.3%.

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<sup>4</sup> The tool used in the research of key competences was standardised. The assumption underlying this research was that all participants do the same test in terms of content. It was important for the research team to establish a possible scope of differences between the groups of able and disabled persons who in the diagnostic sense might become indirectly the predicate for differentiation of their situation on the labour market. Typhlopedagogues, surdopedagogues and oligophrenopedagogues took part in the process of designing the tool.

Unfortunately, despite the above-mentioned increase in the professional activity and employment rates of the disabled, the economic crisis contributed to the reverse of the positive tendency, which resulted in a decrease in the unemployment rate among people with disabilities. In 2006 it equalled 17.3%, in 2007 it dropped considerably reaching the level of 14.1%, in 2009–12.8%, however, in 2010 it climbed to 15.3%<sup>5</sup>.

People with disabilities are less active in looking for employment than the able. The differences between the groups are substantial. In 2010 the indicator for the group of people with disabilities constituted 25.9%, whereas for the able 76.2%. One of the reasons for the difference might be the lower level of key competences, proven by the results of the research within the project number N N106 067535, in comparison to the group of the able. However, it is not certain to what extent it translates into other, crucial characteristics, essential for the development of determination needed in active search for a job, such as the personality of people with disabilities. Do people with developmental disorders show a lower level of self-esteem which can influence significantly the development of their high self-esteem and effectiveness in the competition for work with able people? What is the level of motivation in striving to employ people with disabilities? Finally, does work play an important role in the life plans of people with disabilities? Answers to these questions could show the crucial factors of the professional activity of people with disabilities, and similarly direct the process of action to provide support for young people with disabilities in avoiding professional inactivity and unemployment. An attempt to answer the question was undertaken in the above-mentioned project.

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*Disability in Numbers [Niepełnosprawność w liczbach]* (revised). (n.d.). Retrieved July 27, 2011, from the Office of the Government Plenipotentiary for Disabled People Web site: <http://www.niepelnosprawni.gov.pl/niepelnosprawnosc-w-liczbach/>

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<sup>5</sup> *Disability in Numbers [Niepełnosprawność w liczbach]* (revised). (n.d.). Retrieved July 27, 2011, from the Office of the Government Plenipotentiary for Disabled People Web site: <http://www.niepelnosprawni.gov.pl/niepelnosprawnosc-w-liczbach/>

*Beata Jachimczak*

Poland

## **Education at a Higher Level in Life Plans of Schoolchildren with Disability who Complete Their Education at a Vocational Level**

### **Abstract**

Over the last decades higher education became a crucial factor increasing the chances of employment. Additionally, the dynamics of changes on the labour market requires a variety of vocational skills from an employee. A contemporary employee ought to incorporate the necessity of work change and retraining into their vision of employment. Labour market analysts point out that people even with good, but narrow qualifications, have potentially the lowest chances of finding a job. If one takes the fact of disability into consideration, these chances are clearly minimising. The key question which should be answered is whether higher education takes an important place in the life plans of people with disability.

**Key words:** *education at a higher level, disability, life plans.*

### **Introduction and the context of research**

The European *Disability Strategy 2010–2020: A Renewed Commitment to a Barrier-Free Europe*<sup>1</sup> informs that one in six people in the EU is disabled. It means that 80 million Europeans have no possibility of full participation in society

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<sup>1</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (2010, November 15). *European Disability Strategy 2010–2020: A Renewed Commitment to a Barrier-Free Europe. (Objectives and Actions)*. Retrieved from <http://www.niepelnosprawni.gov.pl/dostepnosc-projektowanie-uniwer/>

and the economy. It is connected with numerous environmental barriers and the attitudes of the public towards disability and disabled people. Full participation in social activity and the economy has crucial meaning for the success of the strategy *Europe 2020*<sup>2</sup>, whose main aim is to take action to develop smart, sustainable and inclusive growth. To create society providing full social participation can result in new vistas for market development and stimulate innovation. To make it real, it is necessary to increase the opportunities for people with disabilities so that they could enjoy their full rights and fully participate in society and in the European economy, in particular thanks to the single market. *The European Disability Strategy 2010–2020* stated a principal objective that is the elimination of barriers for people with disabilities in social accessibility. Furthermore, the Commission named eight main areas for action: accessibility, participation, equality, employment, education and training, social protection, health and external action.

Among the enumerated areas, the most crucial for research are: education and training, and employment as well. The EU's data shows that in the 16–19 age group there are 37% of considerably disabled people, 25% disabled to some extent, and 37% with a mild level of disability, who do not participate in education<sup>3</sup>. It implies the necessity of diagnosing and monitoring the actions focused on the change of unfavourable rates especially in the context of EU promoted initiatives like *Youth on the Move* or *Lifelong Learning Programme*, in which people with disabilities should take part as the full citizens of the European Union.

Participation in education aimed at getting education is the basic condition for participation in society and the economy. Without doubt, receiving an education increases the professional activity of a person, which applies similarly to the able and the disabled.

The analyses carried out by the Office of the Government Plenipotentiary for Disabled People show that there is the following relation: the higher the level of education obtained by people with disabilities, the higher the rate of their profes-

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<sup>2</sup> Communication from the European Commission (2010, March 3). *Europe 2020: A European Strategy for Smart, Sustainable and Inclusive Growth*. Retrieved from [http://ec.europa.eu/eu2020/pdf/1\\_PL\\_ACT\\_part1\\_v1.pdf](http://ec.europa.eu/eu2020/pdf/1_PL_ACT_part1_v1.pdf)

<sup>3</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (2010, November 15). *European Disability Strategy 2010–2020: A Renewed Commitment to a Barrier-Free Europe (Objectives and Actions)*. Retrieved from <http://www.niepelnosprawni.gov.pl/dostepnosc-projektowanie-uniwer/>

sional activity and employment. People with secondary and higher education have the biggest chances of employment<sup>4</sup>.

Education and employment of people with disabilities are the basis for action for increasing the quality of their lives; especially in respect of the information that the poverty rate of people with disabilities is 70% higher than the average. It is the consequence of limited access to employment by people with developmental disorders<sup>5</sup>. Work guarantees economic independence, spurs people to personal achievement and is the greatest protection against poverty. However, the employment rate of people with disabilities in the EU is around 50%, which was assessed by the EU's experts as low. For comparison, in Poland the employment rate for people with disabilities was 25.9% in 2010; it was visibly lower than in the whole EU.

## **Methodology**

The above analyses were performed in the context of the results of the studies done within the research project entitled: *Educational factors at the start and professional insertion of young disabled persons (based on the example of the Łódź province) [Edukacyjne uwarunkowania startu i aktywizacji zawodowej młodych osób niepełnosprawnych (na przykładzie województwa łódzkiego)]*, lasting from 19<sup>th</sup> September 2008 to 18<sup>th</sup> September 2011. The project was financially supported by the Ministry of Science and Higher Education within the 35<sup>th</sup> competition for research projects (Number N N106 067535).

One of the main objectives defined during the research was a diagnosis of educational factors determining career prospects in the case of people with disabilities completing vocational education. Within the main objective there was formulated another specific objective which focused on establishing the concept of future work and its place in the life plans of young people with disabilities from the perspective of career needs and reasons for choosing work. The realisation of the main objective was conducted through the diagnosis of indicated areas by means of various research tools. One of them was the author's original questionnaire *Life*

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<sup>4</sup> Disability in Numbers [Niepełnosprawność w liczbach]. (n.d.). Retrieved from <http://www.niepelnosprawni.gov.pl/niepelnosprawnosc-w-liczbach/>

<sup>5</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (2010, November 15). European Disability Strategy 2010–2020: A Renewed Commitment to a Barrier-Free Europe (Objectives and Actions). Retrieved from <http://www.niepelnosprawni.gov.pl/dostepnosc-projektowanie-uniwer/>

*Plans (Plany życiowe)*. The questionnaire concentrated on a few areas such as: life plans and chances of their realisation; occupation and sectors in which the subjects would like to work; the offer of vocational education; vocational education assessment and the assessment of preparation for the realisation of career tasks gained from finishing education. In the first specified area – life plans and the chances of their realisation – the participants of the study were asked about the continuation of education at a higher vocational level and a higher university level.

## **Participants**

Three groups of people with disabilities took part in the research: people with visual, hearing and intellectual impairment from the Łódź province. The subjects were schoolchildren who were finishing their education at the basic vocational level and secondary technical level. The control group consisted of able pupils who, like in the case of the pupils with disabilities, were also finishing education at the basic vocational level and secondary technical level. In total, 354 people participated in the research: 173 of the disabled and 181 of the able. All the subjects attended schools in the Łódź province.

## **The results of research in the context of participation realities in regard to people with disabilities at a higher level of education**

The last two decades have aroused the public interest in the issue of disability. The social campaigns which were launched at the beginning of the 1990s drew people's attention to the need for taking action against social marginalisation and exclusion of people with disability, in the educational and professional dimensions. It resulted in the implementation of the range of law regulations concerning the support for people with developmental disorders, which aimed at providing equal opportunities in all spheres of life. In spite of the undertaken action, people with disabilities are still badly educated in comparison to able people. The data from the Office of the Government Plenipotentiary for Disabled People shows that only 8.6% of the disabled have a higher education, 34.1% secondary technical and the majority of them, i.e. 39.4%, basic vocational. For comparison, in the group of able people 22.4% of the population at working age have a higher education, 61.2% – secondary education and 27.4% basic vocational. It is comforting to notice that the percentage of people with disabilities gradually increases in the group of studying people.

The data from 2007–2009 shows<sup>6</sup> that in those years more and more people with disabilities continued their education at a higher level. In 2007 there were only 23 thousand (22,988) of disabled students, but in 2009 the number increased to nearly 28 thousand (27,975). The biggest homogeneous group of students is formed by the physically challenged (walking) – 26.34%, next visually impaired – 8.43%, hearing impaired – 6.76% and disabled (non-walking) – 2.14%.

**Table 1.** Participation of people with disabilities among the studying people in 2007–2009

	Total	Women	Hearing impairments	Visual impairments	Physically impaired		Other
					Walking	Non-walking	
2007	22,988	13,499	1,491	1,874	5,316	503	13,804
FTS <sup>1</sup>	12,569	7,029	872	1,063	2,818	251	7,565
EMS <sup>2</sup>	10,419	6,470	619	811	2,498	252	6,239
2008	25,265	15,126	1,723	2,042	6,367	560	14,573
FTS	13,089	7,364	914	1,137	3,066	277	7,695
EMS	12,176	7,762	809	905	3,301	283	6,878
2009	27,975	16,661	1,891	2,357	7,368	599	15,760
FTS	14,552	8,161	1,029	1,314	3,642	298	8,269
EMS	13,423	8,500	862	1,043	3,726	301	7,491

<sup>1</sup> Full-time studies; <sup>2</sup> Extramural studies

Participation of women with disabilities grows steadily in the group of studying people with developmental disorders. People with disabilities more frequently undertake full-time studies rather than extramural studies, nevertheless, the differences are not significant.

An important question that should be addressed, in the context of the performed analyses, is: what are the reasons for such a modest number of people with disabilities who study today? Are people with disabilities prepared sufficiently enough at lower educational levels prior to higher education? Do they lose in rankings with able people because of their lower results? Or perhaps, they are not interested in pursuing education at a higher level.

<sup>6</sup> Central Statistical Office (2008). *Higher Education Institutions and their Finances in 2007*. Warszawa: Wydawnictwo GUS; Central Statistical Office (2009). *Higher Education Institutions and their Finances in 2008*. Warszawa: Wydawnictwo GUS; Central Statistical Office (2010). *Higher Education Institutions and their Finances in 2009*. Warszawa: Wydawnictwo GUS

As a result of the author's research<sup>7</sup>, an attempt was made to answer one of the previously stated questions concerning the importance of continuing education at a higher level in the life plans of people with disabilities. Apparently, the continuation of education in the examined group of the disabled school-leavers finishing vocational schools (basic vocational and technical secondary) does not play a pivotal role in their life plans. 85.46% of them find the continuation of education as not important and slightly important, for 13.37% it is of neutral importance. Only 1.16% of the people with disabilities regard education at a higher level as an important life goal. None of the examined considered the continuation of higher education as a highly important goal in their life plans.

**Table 2.** The importance of continuation of education at a higher vocational level in life plans of the examined schoolchildren with and without disabilities completing their education at the level of technical secondary school.  
(On the basis of conducted research)

Possible answers	Disabled people	Able people
Not important	59.88%	60.56%
Slightly important	25.58%	30.56%
Neutral importance	13.37%	7.78%
Important	1.16%	0.0%
Very important	0.0%	1.1%

The distribution of the results in the group of able people is similar to the group of pupils with disabilities. Over 50% (53.01%) of vocational school-leavers regard their chances of continuing education as little or none. Almost 32% (31.93%) cannot define them, and only 15.06% interpret them as high or very high.

The above-quoted opinions of young people finishing education at a vocational level (basic vocational and technical secondary) show, in all probability, that they are not interested in further education. In terms of the mentioned information that the higher the education level of potential employee, the bigger the chances of employment, one should be concerned about the future of the people who decide to finish their education especially at a vocational school level. In this case, the

<sup>7</sup> Beata Jachimczak is a research contractor and a member of the research team who carries out the project supported by the funds of the Ministry of Science and Higher Education, N N106 067535. The coordinator of the project is dr hab. Iwona Chrzanowska. The other research participants are: dr Barbara Olszewska, dr Dorota Podgórska-Jachnik

threat of unemployment and progressive growth of professional inactivity seems real. People with disabilities are more often becoming professionally inactive and therefore do not try to find work in comparison to able people. The lack of professional activity or only slight activity, might be caused by their conviction that some minimum financial security is always available – in the form of pensions reserved by law for people with medical certificates of disability. In reality, a lack of occupation and no vistas of future work result in exclusion and social marginalisation of a person.

Social participation of people with disabilities, which is mentioned in the communication of the European Commission, *Europe 2020*, will be possible provided that potential participants want to be in fact the participants of events, and that their approval of self-participation will be real not verbal. In that case, there is much room for improvement at the stage of education. At none of its levels, not even those which finish the period of compulsory education, does the contemporary Polish education system include in the curriculum the issues connected with employment and future work. Young people, both able and disabled, learn for “here and now” in order to get a promotion to the next form, successfully pass tests and external assessment. There is no trace of long-term learning. Teenagers have more difficulty in choosing their right path of education. They limit themselves to choosing the best lower secondary school and high school (with the best results of external examinations). They want to have the highest competences, not knowing what they would like to achieve in the future.

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## **Machiavellianism and Problem-solving Strategies in a Marriage Relationship**

### **Abstract**

The aim of the study was to examine the relationships between the level of spouses' Machiavellianism and tendency to use constructive and unconstructive problem-solving strategies in marital conflicts. The study involved 100 married couples. The participants completed Mach IV and the Problem-Solving Strategies Inventory in two versions: self-report and estimation of partner behaviours. Two exploratory path analyses were performed. The analysis of data coming from self-reports proved that Machiavellianism was positively associated with the tendency to use destructive strategies (Escalation and Withdrawal), and negatively with the use of constructive strategies (Loyalty and Dialogue). Higher Machiavellianism of women was related to less frequent use of Dialogue strategy by their husbands. The data obtained through estimations of partner behaviour showed that a higher level of Machiavellianism among husbands was related to their wives' more frequent use of Escalation and Withdrawal, as well as to their less frequent use of Loyalty and Dialogue. The results support the assumption that Machiavellianism may be treated as a factor which makes constructive solving of matrimonial conflicts more difficult.

*Key words: personality, Machiavellianism, conflict, interpersonal relations, marriage, problem solving.*

### **Problem**

Machiavellianism is a personality feature or a behavioural strategy which is manifested in striving for achievement of egocentric goals through manipulating

a partner (Fehr, Samsom & Paulhus, 1992; Wilson, Near & Miller, 1996; Jones & Paulhus 2009). A Machiavellian has a negative opinion about people, egoistic motivation and accepts deceptive techniques of social influence. Important elements of Machiavellian personality are: coolness, emotional distance and a lack of empathy (Barnett & Thompson, 1985; Wastell & Booth, 2003). Christie and Geis (1970) approved the above-mentioned Machiavellian features as critical, and named them as “*cool syndrome*”. Those features make it more difficult for a Machiavellian to establish close, warm and long-lasting relations with other people, and they cause a lack of involvement in a relationship. On the other hand, they make it easy to instrumentally treat a partner with coolness and impersonal attitude.

Machiavellians show a strong motivation for achieving personal goals by all available means, refraining from the ethical aspects of their own decisions. As a result, in many experiments, they obtain better scores than non-Machiavellians, who are focused on the partner and on the interaction (Fehr et al., 1992; Wilson et al., 1996). It is otherwise in everyday life situations – here, Machiavellians’ advantage becomes problematic. (Hunt & Chonko, 1984; Gable & Topol, 1991; Graham, 1996). Particularly, in the field of close, interpersonal relations (friendships and love relationships) high Machiavellianism of one of the partners may be an obstacle which makes establishing of a relationship difficult, and its quality lower (Pilch, 2007; 2008).

The influence of partners’ personality traits on their marriage relationship is shown, first of all, in the interpersonal communication process (Fitzpatrick & Badzinski, 1994). In a stable relationship, there might be expected differences in the ways of communication and in the preferred strategies of influencing, which are related, among other things, to the level of Machiavellianism of both partners. Communicating with a partner seems to be necessary for the manipulating person to effectively influence his/her partner. Prior research (Pilch, 2008) showed that the higher the level of spouses’ Machiavellianism the more often – in their own opinion – they assumed a deprecating style of communication with their partner (aggression, domination, control), and the more seldom they showed support and involvement (showing respect, interest, care, stressing the partner’s importance) (Pilch, 2008, p. 185). The above-mentioned differences should also be observed in a conflict situation. A Machiavellian is usually interested, first of all, in his/her own gain and he/she would rather disregard the partner’s needs and goals, whereas a non-Machiavellian is focused on the partner, as well as on the good and ethical aspects of the relationship. Therefore, the preferred conflict solving strategies of people who show different levels of Machiavellianism may vary.

In accordance with a two-dimensional classification of conflict solving strategies (Rusbult, Johnson & Morrow, 1986), all the behaviours which occur in a conflict

situation may be evaluated in two dimensions: constructive/destructive (evaluated from the point of view proper for the sake of relationship) and active/passive (undertaking/refraining from visible behaviours). Therefore, four types of behaviour might be distinguished in a conflict situation: constructive and active behaviours (Dialogue), constructive and passive ones (Loyalty), non-constructive and active (Escalation of conflict) and non-constructive and passive (Withdrawal) (Kriegerlewicz, 2003).

It might be expected that a Machiavellian, who is not interested in the partner's needs, will undertake constructive behaviours (Dialogue and Loyalty) which serve for the good of both spouses more seldom than a non-Machiavellian. Such behaviours, as long as they appear, might be motivated by a will to achieve an immediate benefit. At the same time, a Machiavellian, in comparison to a non-Machiavellian, may show active, destructive behaviours (Escalation) more often, because he/she is not interested in refraining from such behaviours for the sake of the relationship. The following hypothesis was subject to verification: Spouses' Machiavellianism is related to the frequency of their using strategies of solving conflicts: negatively – with Dialogue and Loyalty strategies, and positively – with Escalation of conflict strategy (hypothesis 1). This relation may be seen both while analyzing the evaluation of the person's own behaviours (self-report), as well as analyzing the behaviours shown by his/her partner (estimation).

Spouses influence each other and they determine joint communication patterns in their marriage (Plopa, 2005). Machiavellianism of one of the spouses may be related to the communication behaviours of the wife or the husband, thus influencing his/her preferred style of solving conflicts. Having noticed an egocentric attitude of the spouse, his/her emotional coolness, mistrust and disloyalty, the partner of a Machiavellian may – as a sort of revenge – respond with a similar behaviour, limiting the number of constructive behaviours while increasing the number of destructive behaviours in a conflict. It was expected that Machiavellianism of one of the spouses is related to the frequency of the other spouse's use of the strategy for solving matrimonial conflicts: negatively – with Dialogue and Loyalty, and positively – with Escalation of conflict and Withdrawal (hypothesis 2).

## **Method**

### **Materials**

**Machiavellianism.** To measure the level of Machiavellianism, Mach IV scale was used (Christie & Geis, 1970). Mach IV contains 20 statements with answers

based on a 7-grade scale: from “strongly disagree” to “strongly agree”. The level of Machiavellianism was indicated by the sum of the score points + 20. Scores in this inventory range between 40 and 160. Higher scores denote higher level of Machiavellianism. The averages were equal to: females  $M = 86.8$ ,  $SD = 10.1$ , males  $M = 91.0$ ,  $SD = 13.4$ ). Internal reliability: *Cronbach's*  $\alpha = 0.69$ .

**Conflict solving strategies.** Problem-Solving Strategies Inventory was used in order to determine methods of solving conflicts among married couples (Kriegerlewiecz, 2003). The questionnaire includes 32 statements which concern behaviours or convictions towards the partner, in situations of conflict. A participant evaluates his/her own behaviour (self-description) or their partner's behaviour (estimation) using a six-grade scale (from “never” to “always”). The tool recognizes four strategies: Dialogue (“Even during an argument, I try to comprehend and to know my partner's point of view”), Loyalty (“When our views on certain issue differ, I prefer to give in so that there will be no quarrel”), Escalation of conflict (“If I am angry with my partner I articulate spiteful remarks about her/him”) and Withdrawal (“When my partner's behaviour makes me mad I stop talking to him/her”). The scale reliability in the study was satisfactory (self-description – Dialogue  $\alpha=0.88$ , Loyalty  $\alpha=0.8$ , Escalation of conflict  $\alpha=0.85$ , Withdrawal  $\alpha=0.91$ ; estimation – Dialogue  $\alpha=0.89$ , Loyalty  $\alpha=0.79$ , Escalation of conflict  $\alpha=0.89$ , Withdrawal  $\alpha=0.92$ ).

### Participants and procedure

The group comprised 100 married couples that had been selected with the use of the “snow ball” procedure. The marriage duration ranged from 1 year to 52 years, and the people's age was from 22 to 76 years. The married couples were raising from 0 to 5 children. The participants had the following education: primary and vocational (25 persons – 12.5%), secondary (96 persons – 48%), and higher education (79 persons – 39.5%). The respondents were given a set of questionnaires with instructions; there were two envelopes: one for the husband and one for the wife. Envelopes with answers were to be sealed and inserted in bigger, collective envelope per one couple. Participation in the study was voluntary and anonymous.

## Results

Two exploratory path analyses were performed. Models of paths were formed on the ground of modification indexes; non-significant paths were deleted ( $p=0.05$ ).

The first analysis (model 1) involved data which described conflict solving strategies coming from the self-description part, while the second analysis (model 2) – coming from the partner's behaviour estimation.

The first objective of the analysis was to determine whether and to what extent Machiavellianism of both spouses is related to the frequency of using certain strategies for solving conflicts, as resulting from the self-description part. In model 1, Machiavellianism of husband and wife and marriage duration are treated as exogenous variables, and conflict solving strategies of both spouses constitute endogenous variables. Model 1 with standardized path coefficients is illustrated in Figure 1. Only statistically significant paths ( $p \leq 0.05$ ) are identified. The model provided adequate fit to the data ( $\chi^2 = 34.079$ ,  $df = 37$ ,  $p = 0.607$ ,  $GFI = 0.945$ ,  $AGFI = 0.901$ ).

Relations between spouses' Machiavellianism and strategies used by them for solving matrimonial conflicts (intrapersonal level of analysis) were similar in the women and men groups. Machiavellianism of the wife would be a direct predictor of Escalation (0.35), and an indirect predictor (through mediation of Escalation) for such strategies as: Loyalty (-0.153), Withdrawal (0.193) and Dialogue (-0.096). The higher the level of Machiavellianism of the wife the more often – according to her own opinion – she would use the Escalation and Withdrawal strategies, and the more seldom – the strategies of Loyalty and Dialogue. Machiavellianism of the husband would be a direct predictor of Escalation strategy (0.33), and an indirect predictor (through mediation of Escalation) for such strategies as: Loyalty (-0.218), Withdrawal (0.235) and Dialogue (-0.213). The higher the level of Machiavellianism of the husband the more often – according to his own evaluation – he would use the Escalation of conflict and Withdrawal strategies towards his wife, and the more seldom – the Loyalty and Dialogue strategies. At intrapersonal level (the person's Machiavellianism and strategies used by him/her for conflict solving) the obtained result was partly in accordance with expectations: Machiavellianism would directly influence only the Escalation strategy. In the case of other strategies, an indirect influence was evident. Hypothesis 1 was therefore partially confirmed.

The differences resulting from a respondent's sex were seen in the analysis of the relation between Machiavellianism and conflict solving strategies, as studied at interpersonal level (the persons' Machiavellianism and conflict solving strategies used by her/his partner). Only the wife's Machiavellianism influenced the husband's Dialogue strategy directly and negatively (-0.14). The higher the level of Machiavellianism of the wife, the more seldom, in a conflict situation, the husband uses the Dialogue strategy towards her. Due to the above, hypothesis 2 – given the data coming from self-report – was confirmed only to a limited extent.

Marriage duration influenced only Loyalty shown by the husband (0.16): the longer the marriage duration the more often the husband uses the Loyalty strategy towards his wife. When spouses were describing their own behaviours in a conflict, the influence of their marriage duration on those behaviours was very small.

The second objective of the analysis was to determine whether and to what extent Machiavellianism of both spouses is related to conflict solving strategies used by them, as resulting from the partner's behaviours estimation. In model 2, Machiavellianism of the husband and the wife and their marriage duration are again treated as exogenous, while the conflict solving strategies of both spouses, determined with the use of estimation, are endogenous variables. Model 2 with standardized path coefficients is illustrated in Figure 2. The model fit was adequate ( $\text{Chi}^2=38.753$ ,  $\text{df}=37$ ,  $p=0.391$ ,  $\text{GFI}=0.936$ ,  $\text{AGFI}=0.886$ ).

At the intrapersonal level of analysis (the person's Machiavellianism and conflict solving strategies used by that person), the obtained result was not in accordance with expectations. Machiavellianism of the husband and the wife was not an important predictor of their behaviours in a conflict situation, therefore hypothesis 1 – given the data obtained from estimation – should be rejected. However, at interpersonal level (the person's Machiavellianism and conflict solving strategies used by the person's partner) only the effects of men's Machiavellianism were observed. The husband's Machiavellianism was a direct predictor of the conflict Escalation strategy used by his wife (0.29) and indirectly influenced the remaining conflict solving strategies of his wife (Withdrawal 0.196, Loyalty – 0.194, Dialogue – 0.19) and – to a very limited extent – the husband's conflict Escalation strategy (0.057). The higher the level of the husband's Machiavellianism the more often his wife uses Escalation and Withdrawal strategies towards him, and the more seldom she uses strategies such as: Loyalty and Dialogue. The wife's more frequent use of the conflict Escalation strategy resulted in a more frequent choice of the Escalation strategy by her Machiavellian husband. In model 2, based on the data coming from the estimations of the partner's behaviours, hypothesis 2 was confirmed only to a very limited extent.

Marriage duration was a predictor of Escalation strategy used by the husband (0.28) and the wife (0.31) as well as the wife's Loyalty strategy (0.15): the longer the marriage duration, the more often the spouses use the Escalation of conflict strategy towards each other, and the more often the wives use the Loyalty strategy towards their husbands.

## **Discussion**

Although the hypotheses were only partially confirmed, all the associations observed in the study between spouses' Machiavellianism and behaviour strategies in a conflict were up to expectations resulting from the concept of Machiavellianism. In accordance with the data derived from self-description, the higher level of Machiavellianism among women and men is often associated with the more frequent use of conflict Escalation and Withdrawal strategies, and with the less frequent use of Loyalty and Dialogue strategies. Moreover, higher Machiavellianism among women co-exists with less frequent use of Dialogue strategy of their husbands. In accordance with the data obtained from partners' behaviours estimations, husbands' higher Machiavellianism is related to the more frequent use of Escalation and Withdrawal strategies by their wives, and with their less frequent use of Loyalty and Dialogue strategies. Machiavellianism of both spouses might be a factor which makes constructive solving of conflicts in marriage more difficult and which has an influence on both the strategies applied by a Machiavellian spouse and on the behavioural patterns used by his/her partner. Such an influence is not only seen in direct effects but also in indirect effects. By increasing the number of behaviours which are undesirable from the relationship wellbeing point of view (Escalation strategy), Machiavellianism contributes to the reduction of the number of desirable behaviours (Loyalty and Dialogue strategies), and to more frequent use of non-constructive strategy of Withdrawal.

Escalation strategy seems to be the least favourable from the spouses' common interest point of view. Another non-constructive strategy – Withdrawal – may not necessarily lead to conflict escalation or to a lack of good solutions in the future. It may allow for “withstanding” the partner's negative emotions and it does not hurt the partner's feelings. Although Withdrawal strategy may not be accepted by a partner, in certain situations it may be recognized as a “lesser evil”. Conflict Escalation (associated with Machiavellianism in a special way) may bring a temporary relief to a spouse who is using it, thanks to venting of negative emotions; also, it may bring certain profits to such a person when the attacked partner agrees on some solution unfavourable to him/her. However, this strategy may not be favourable to the marriage relationship as a whole.

The relation of Machiavellianism to the use of certain conflict solving strategies as used by a Machiavellian spouse could only be seen in the analysis of data coming from the self-description part (model 1). There are no differences in that matter between the groups of men and women. The spouses of Machiavellians (both men and women) did not assign them a more frequent use of conflict

Escalation strategy (model 2), which is not in accordance with Machiavellians' self-estimation. Perhaps Machiavellians, masters at creating their own image (Zaidman, & Drory, 2001; Lopes & Fletcher, 2004; Sherry, Hewitt, Besser, Flett & Klein, 2006), are able to "camouflage", pertinent to that style of conflict solving, aggressive, hostile, competing and ignoring their partner's emotions, activities, e.g. by providing their external causes ("If it depended on me ..."), adding an "altruistic" motivation ("I had to yell at you although I don't like it – for your own good"), or blaming the partner ("I would never have said it if you had not provoked me"). Being subject to the said manipulations, partners of Machiavellians attribute behaviours to Machiavellians that lead to conflict escalation, to the same extent as the spouses of non-Machiavellians do. Such an interpretation of the results is in accordance with the widespread opinion about extraordinary self-presentation talents of Machiavellians, and it also shows that they put a great deal of importance to working out their image. According to Wilson et al. (1996), Machiavellians in the long-term relationships are either destined to failure or achieve success thanks to a sort of "mimicry" which entails "pretending" to be a non-Machiavellian. The presented results rather provoke suspicion that such pretending activities might be undertaken by Machiavellian spouses and that even in long-term relationships they might end in success. The results are in line with the results of the study where the wives of Machiavellians evaluated their husbands' tendency to behaviours proving support and involvement in the relationship as higher than it was in the case of the wives of non-Machiavellians; although the husbands thought of themselves quite the opposite, which may also be interpreted as a result of effective self-presentation efforts undertaken by Machiavellian husbands (Pilch, 2008).

The relation between Machiavellianism of one of the spouses and the frequency of using certain conflict solving strategies by the partner depended on the source of data. In model 1 (data obtained from self-description), the higher the level of Machiavellianism of the wife the lesser the inclination towards Dialogue shown by her husband. In model 2 (data from estimation of the partner's behaviours), the higher the level of Machiavellianism of the husband, the lesser the inclination towards conflict Escalation of his wife.

In comparison to husbands with lower Machiavellianism, Machiavellian husbands perceive their wives as more inclined to non-constructive, conflict escalating behaviours (model 2). At the same time, Machiavellian husbands see similar conflict Escalation inclinations in themselves (model 1). Therefore, we can suspect that unfavourable for the relationship, non-constructive behaviours of the wives of Machiavellians may be a reaction to their husbands' actions, which aims at "getting even" (although those women themselves do not have to be aware of it). At the

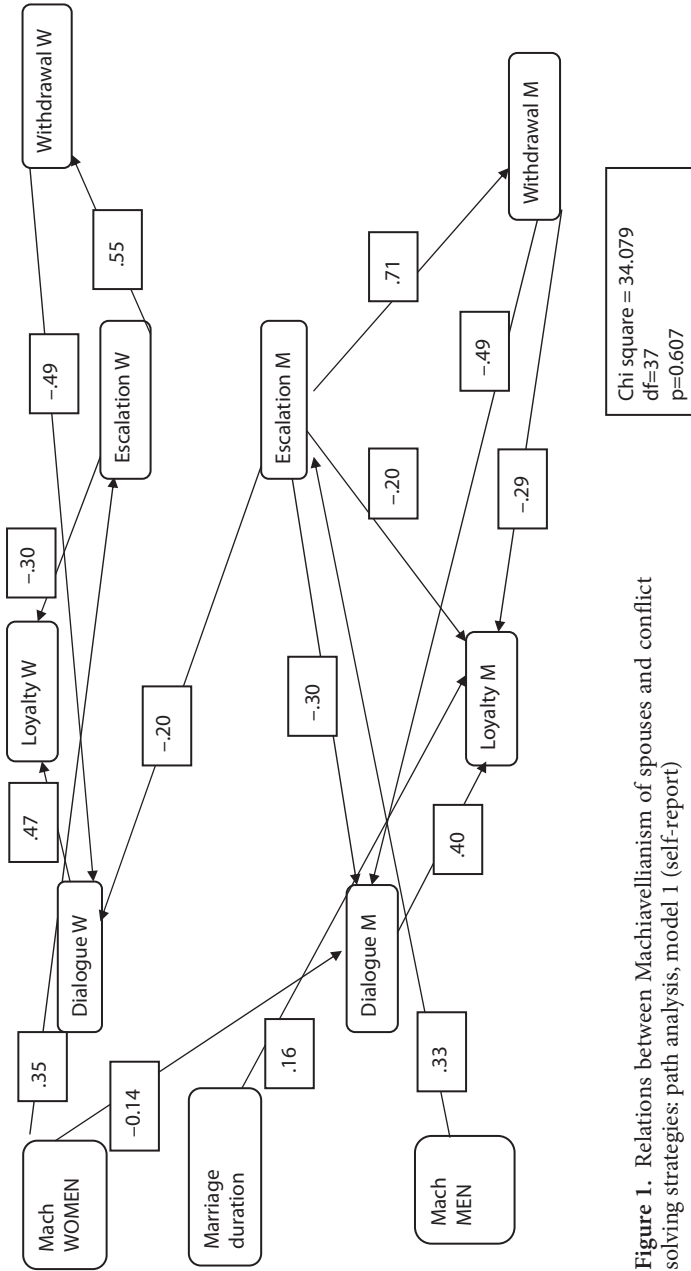


Figure 1. Relations between Machiavellianism of spouses and conflict solving strategies: path analysis, model 1 (self-report)

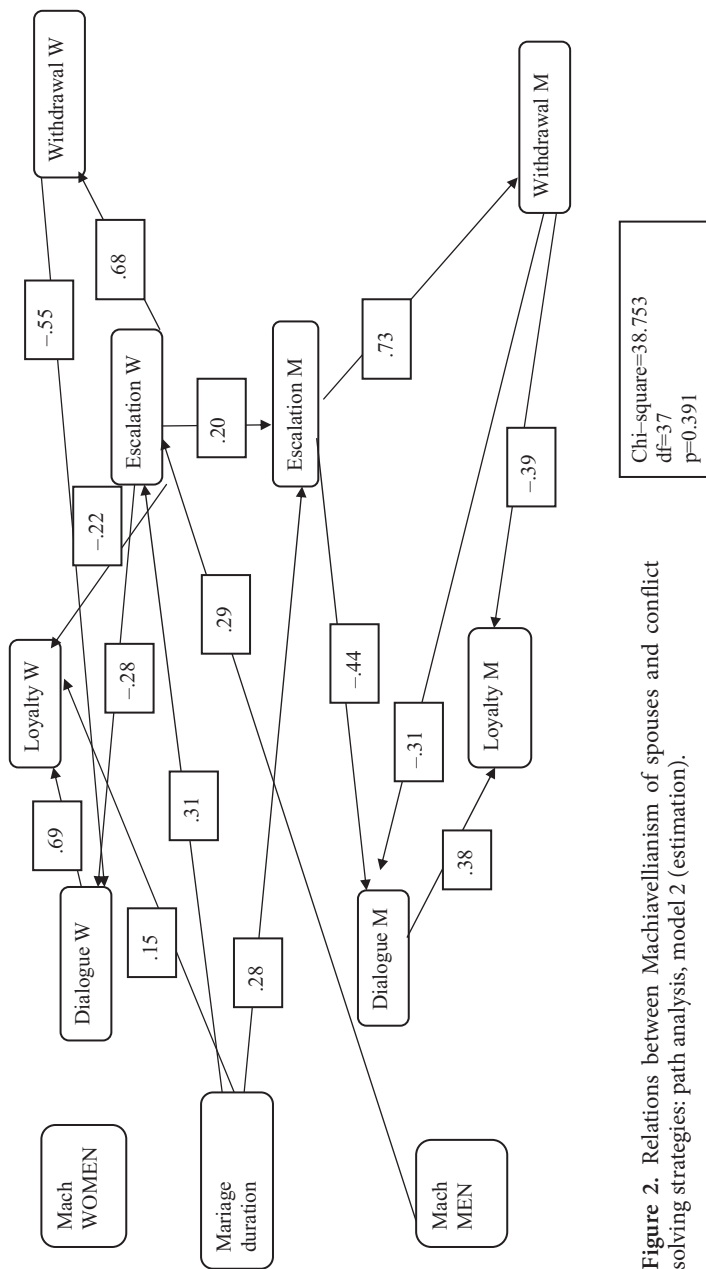


Figure 2. Relations between Machiavellianism of spouses and conflict solving strategies: path analysis, model 2 (estimation).

same time, Machiavellian wives do not perceive their husbands as more inclined to conflict Escalation (model 2), although they see such a tendency in themselves, similarly to Machiavellian husbands (model 1). Where does this difference come from? Maybe, towards women – known as “experts of sustaining the bond”, more severe evaluation criteria were used than it was in the case of men. The same words if spoken by men seem to be “neutral” while if spoken by more delicate and sensitive creatures as women, seem to be brutal and insulting. The said, hypothetical difference associated with stereotypes assigned to sexes, by influencing evaluation of certain behaviours, might have been seen in the above results.

Husbands of Machiavellian wives, in comparison to husbands of non-Machiavellians, perceive themselves as less inclined to using Dialogue strategy (model 1). Similar relation in the case of wives was not observed. Again, in this case, the said difference might be tried to be explained with the differences in the roles played in marriage by men and women. Dialogue is the most desired strategy for solving conflicts, which aims at the spouses’ mutual benefit. Maybe, in a marriage type of relationship, women – the wives of Machiavellians (who are more interested in the good of the family) do not limit “as part of a revenge” a constructive Dialogue, because they feel to a greater extent as those who are responsible for the family’s well-being. Women are also to a greater extent than men, trained in such behaviours that are in accordance with the role of a wife.

Therefore – in view of the presented results – the wives of Machiavellian husbands may (in the opinion of their husbands) more often than other wives, use the strategy of Escalation, but at the same time they do not limit the constructive strategy of Dialogue towards their partners. However, the husbands of Machiavellian wives, most likely, are less inclined than other husbands to conduct a Dialogue, but they do not abuse the non-constructive strategy of Escalation towards their wives.

Associations of spouses’ Machiavellianism with their behaviours in conflict situations depended on the source of evaluation of those behaviours. Whenever the behavioural strategies in a conflict situation were determined based on the spouse’s behaviour estimations, Machiavellianism of the wife and husband was not related with her or his behaviours. But, whenever the strategies were determined based on self-description, the influence of Machiavellianism of both spouses on the behaviours presented by them was clear, both in men and women groups. Machiavellianism was then a predictor for using Escalation of conflict strategy and also indirectly influenced the frequency of using strategies such as: Dialogue, Loyalty and Withdrawal. High Machiavellianism supported the occurrence of non-constructive strategies and limited the frequency of using the constructive ones.

Relations of spouses' Machiavellianism to their partners' behaviours in a conflict situation were different in the groups of men and women. The husbands of Machiavellian women showed a lesser tendency for Dialogue, however, this relation concerned the data obtained from self-estimations. The wives of Machiavellian men more often than other women would use conflict Escalation strategy towards their husbands, however, the source of the said relation was the data obtained from estimations of their behaviours.

Differences in the roles of a husband and a wife, and therefore the differences in expectations towards them, cause the influence of a Machiavellian orientation of each spouse on the marriage and family well-being, to be different. The above-mentioned differences encourage undertaking of research on strategies in dealing with difficulties resulting from the partner's Machiavellian inclinations, with inclusion of very probable differences between sexes in that field.

It is difficult, based on evaluations that are naturally subjective and one-sided, to deeply investigate compounded relations between spouses. This study has shown that Machiavellianism of spouses is a feature that may be related to the strategies used by partners in solving matrimonial conflicts.

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Review

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**Review**



### **Book Review:**

**Bronislava Kasáčová, Simoneta Babiaková, Mariana Cabanová,  
Ewa Filipiak et al., *Teacher in preschool and elementary stage  
of primary education. Professiography in a Slovak-Czech-Polish  
study.* Banská Bystrica: PF UMB, 2011**

The area of educational sciences has been enriched by another study. The study of a monograph range represents a few benefits that we are going to describe in brief.

1. We can see the contribution in the study contents focusing on the chosen topic within international context when comparing research results from three countries – Slovakia, Bohemia and Poland. The research project of the Slovak agency APVV brought together research teams from the above-mentioned countries. Through participating in the project they demonstrated the possibility of mutual coordination and feasibility of team work.

2. We also appreciate its contents structure in which individual chapters are organised and ordered logically and the reader will learn about many aspects of the teaching profession that have not been sufficiently dealt with or explored in research. The indicated topic is the professiography of a teacher in preschool and elementary education. Theoretical rationale ends up in specific findings – the analysis of teachers' activities in the three countries.

3. However, we can see the major contribution in the study contents included in eight main chapters. The first three chapters comprise theoretical framework while we would like to attract the reader's attention mainly to chapter three. "Pedeutological studies and teacher professiography". This very chapter points to the complexity of the issue as the teaching profession is relatively hard to record and describe in terms of all activities that teachers must perform. Hence, what is

even more valuable is the research team's target of choosing the teaching profession that all of us have encountered and that seems to be clear and straightforward at first sight. Let me draw your attention to subchapter 3.5.3., in which various types of profesiograms are described while in detailed study it becomes obvious that this profession is problematic and thus its profesiogram has certain specifics. More important, then, are further chapters devoted to the activities analysis of the Slovak, Czech and Polish teachers.

The deepest and most detailed analysis is the one of the Slovak teachers' professional activities. The complexity of these activities is determined both by the nature of teachers' work (preschool vs. elementary education), and by the description of the activities that are directly associated with the educational process and its preparatory stage (marked as structured activities), as well as by the description of "indirect" and irregularly performed ones. The following chapters retrospectively analyse the situation in professional activities of the Czech and Polish teachers.

4. Another asset is the straightforward presentation of the results in chapter eight. A transparent comparison of the results in the target countries is highlighting a few common values as well as certain specifics.

5. Study supplements also add positively to the contents. These demonstrate the ethical –scientific treatment of the subject matter reflected, e.g. in The Registration sheet approved by the respondents. Published is also the Respondent research manual including a profesiography of preschool and elementary education teacher. These supplements in particular point to a sound preparation of the project and may then be inspiring for researchers in other countries as the abridged study has been translated into English and published.

6. Comprehensiveness and scientifically pinpointed data also have a practical impact. They may serve as a relevant basis in the selection process among teacher training programme applicants as the profesiography results generally serve exactly this purpose. They are also applicable in developing pre-service teacher training programmes for preschool and elementary stage teachers as well as designing contents of various in-service training projects. The last, but not least, outcome of the results is their use in creating and modifications of various legislative documents in the respective countries.

Another interesting fact is that the study, its authors and the investigations are focused on the countries that are also connected within the same journal, i.e. The New Education Review.

### **Book Review:**

**Barbara Skałbania, *Diagnostyka pedagogiczna. Wybrane obszary badawcze i rozwiązania praktyczne.*  
Cracow: Impuls, 2011, pp. 308**

The appearance of the present publication constitutes a long-awaited sign of joining the theoretical deliberations on this particular subject by people actively involved in actions within the area of pedagogical diagnosis.

Barbara Skałbania's book, *Diagnostyka pedagogiczna. Wybrane obszary badawcze i rozwiązania praktyczne* (*Pedagogical diagnostics. Selected research areas and practical solutions*), contains a compendium of information concerning the basics of pedagogical diagnostics, addressed to educational psychologists and teachers. The greatest value of the book, written by a practising diagnostician, lies in the author's ability to set practical diagnostic action in various contexts of pedagogical influence.

In accordance with the requirements of education reform, the teacher's diagnostic tasks involve a wide behaviour repertoire, aimed at cognition, identification, description and assessment of various areas of student activity. The fact of underlining the need for diagnosis process, conducted within the school environment, places it among teachers' other tasks which, in turn, require the appropriate factual and methodological knowledge of the person being a diagnostician. The book is addressed to a wide audience but above all to teachers, educational psychologists, students of teacher training faculties and all the people actively involved in pedagogical diagnosis.

The book is a review of extensive thematic literature, perfectly systematized and skilfully selected, which has been combined with a presentation of practical activities aimed at developing diagnostic skills. The combination of theory and practice

is a very successful attempt to conceptualize an optimal model of pedagogical diagnosis which remains in the area of research.

The presented work has a clear structure. In the first part, the author starts with presenting the phenomenon of diagnosis seen from the perspective of various definitions, makes an effort to determine its place in the field of social sciences and stresses the teacher's diagnostic tasks. Undertaking the subject of methodological preparation, the author refers to various aspects of the pedagogical diagnosis process, taking into account interpersonal relations, the diagnostician's competence and ethical attitude as well as basic working skills and techniques. The presentation of a wide array of methodological capabilities accounts for two areas of pedagogical cognition: a clinical and an experimental one, stressing the significance of qualitative methods in acquainting with educational phenomena.

The second part of the book concerns the process of diagnosing two important upbringing environments: family and school. Issues being the subject of a diagnostic procedure are discussed in the light of various theories (building knowledge on the subject of various upbringing phenomena), next they are shown as the subject of research analyses. Among them there are issues concerning the process of acquainting oneself with family, school atmosphere, diagnostic tasks of an educational psychologist undertaken to aid child development, as well as the issues connected with identifying students' adaptation problems, evaluation of problem behaviour or recognising the sources of school difficulties including the dyslexic ones.

Each thematic part is followed by a presentation of selected parts of research tools which may be used by educational psychologists. Personal thoughts and professional experiences connected with conducting diagnostic actions constitute the unquestioned value of the presented publication. These, in turn, present also the author's personal attitude towards the subject of pedagogical diagnosis. The description of these thoughts and experiences presents a practical context of diagnostic actions where theoretical assumptions are contrasted with reality.

Suggested practical tasks closing a particular thematic part are of great educational value in the process of practical training of educational psychologists. The book written by Barbara Skalbaniá deserves to be called a "textbook" for educational psychologists, and is a valuable source of knowledge and skills in the area of gaining diagnostic skills in their broad sense: factual, methodological, methodical, as well as personality-based.