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CAPACITY AND CAPACITY UTILIZATION: THE CASE OF TRAWLER FISHERIES IN NHA TRANG, VIET NAM

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Abstract: To develop effective capacity management programs, it is significant to evaluate and control the fishing capacity and its utilization in order to reduce overcapacity and excess capacity and create a stable development of marine resources. This study estimate fishing capacity and capacity utilization (CU) for the multi-species small- scale trawlers in Nha Trang, Vietnam. Using a mathematical programming approach - data envelopment analysis (DEA), the results from this study shows that most of vessels in Nha Trang were operating at less than their full capacity and there was excess capacity in the trawl fleet. Based on these findings, some policy implications for trawl fishery management in Nha Trang are also provided and discussed.

Keywords: Capacity, Capacity utilization, trawl fishery, DEA.

1 Introduction

Overcapacity is the key problem afflicting marine capture fishery resources. Over the two decades, 1970-1990, global harvesting capacity of world fisheries industries grew at the rate of eight times greater than the growth rate of landings from capture fisheries (FAO, 1999: p.206). This indicated that the sustainability of world fisheries, the undermining of many conservation and management efforts and significant economic waste are results of overcapacity or excess capacity. In the late 1990s, FAO started treating the fishing capacity issue as a political priority with the aim to reduce overall fleet capacity.

Capacity and capacity utilization (CU) estimates are desirable since overcapacity is often cited as the major reason for overexploitation of fisheries around the globe (FAO, 1998). We know in open-access fishery excess capacity exists. It is important to show benefits of reducing effort for fishermen jointly (for society) in a cooperative setting. Vessels may be still the most efficient their individual perspective for a long-time period when they operate less than 360 days per year or in uncertain weather conditions or reduce inputs used if their capacity is fully utilized and marine resources is sustainable. Through capacity and CU measures we could generally expect that fishermen in open-access fishery can evaluate whether their fishing capacity is efficient or not and can adapt their capacity and its utilization optimally.

This study will use data envelopment analysis (DEA) to measure capacity output and CU of each trawl vessel in Nha Trang city. The methodology, capacity research experiences and the results obtained from this study will open the base for later research on fishing capacity in Vietnam and contribute to perfect building objective the National Plan of Action – Capacity (NPOA – Capacity) of Vietnamese Government.

2 Fisheries In Nha Trang

Nha Trang is central city of Khanh Hoa province. Trawl is one of most important fishing method in Nha Trang with 725 of 2648 registered vessels (2005). They include both single trawlers and pair trawlers. Trawlers are mainly small-scale size. The number of trawlers increases sharply due to the fact that techniques are rather simple.

In this study, the analysis concentrates on trawl fleets operating in two different fishing grounds which are primarily located in Vinh Truong and Vinh Luong communes. Trawlers in Nha Trang fish year-round at depth from 40 to 50 m. Often trips are only overnight. Sometimes vessels with high engine power (40-55 HP) and larger gear have fishing time from 3 to 4 days per trip. Outputs of trawl fleet include mixed fish, demersal fish, trash fish, crabs and shrimp (more than 80% of the catch) (Ngoc, *et al.*, 2009).

3 Definitions Fishing Capacity And Capacity Utilization.

3.1 Capacity

In 1999, an International Plan of Action for Management of Fishing capacity of Food and Agricultural Organization of the United Nation (FAO) agreed which calls for all member state to achieve efficient, equitable and transparent management of fishing capacity by 2005, and to provide estimates of capacity of their fishing fleets by 2001. Under the guidelines by FAO technical working group on management of fishing capacity (FAO, 1998), capacity definition is basically the same as Johansen's definition of capacity in a production system where fishing capacity is "*… the maximum the amount of fish over the period of time (year, season) that can be produced by a fishing fleet if fully utilized, given the biomass, the age structure of the fish stock and the present state of the technology"*. That is,

$$Y_c = Y(E_c, S)$$

Where:
Y_c is current (maximum) yield or catch
E_c is current effort at produced by a fully utilized fleet (100% capacity utilization). E is function of K-capital investment and V-variable inputs
S is fish stock biomass, the fishing fleet is the stock of inputs, and assuming that management objectives are related to sustainability of the resources (FAO, 1998b). In this sense, capacity is strictly defined as a short-run concept, given the limitation on the level of fixed inputs (capital stock) (Lindebo, 2004).

3.2 Capacity utilization

CU is an important concept related to capacity. CU is an output-oriented measurement; it presents the proportion of variable capacity that is utilized (Morrison, 1985).

In the technological-economic approach that was adopted by FAO, full CU represents full capacity[1] and its value is always less than or equal to one (CU<=1). If CU of one firm is less than one, it means that firm can increase the production with the present state of capital or equipment or on other words that firm can raise the potential production without pay more for new capital or equipment (Klein and Summers, 1966). If CU equal to 1, productive capital, other fixed inputs and variable inputs are fully utilized. There are two different ways to measure CU in this approach. First, it is measured by the ratio between the present (observed) output and the capacity output which obtainable at fully use of variable inputs of production (Nelson, 1989; Morrison, 1985). In this case, CU is called CU-observed. Second, it is measured as ratio of the output technical efficiency (the level of maximum output that vessels achieved at given set of inputs with state of technology, environment condition, and resources stocks are fixed) to the capacity output level. The observed output level may be TAC level if TACs are used (Fare, *et al.*, 1989). CU is referred as CU-efficient.

We can see a difference between two measurements of CU above. In the first approach a numerator may be technically inefficient and a denominator is technically efficient. In contrast, the second approach both numerator and denominator is technically efficient output levels (Kirkley J. E., *et al.* FAO 2003).
If the economic concept of capacity is considered, CU is not restricted to being less than one in value. If CU greater than 1, it means actual output can be larger than desired economic output and the inputs used are over-utilized. If CU is less than 1 in

[1] Full capacity is defined as an attainable level of output that can be reached under normal input condition – without lengthening accepted working weeks, and allowing for usual vacations and for normal maintenance (Klein and Long , 1973: p. 744)

value, excess capacity exists, or the inputs used are under-utilized. If CU equal to 1, capacity is fully utilized and all production inputs have reached their full equilibrium levels (Pascoe, *et al.*, FAO 2003).

4 The Dea Framework

This study will use DEA to calculate the capacity and CU under the framework developed by Fare et al. (1989) in which only the fixed inputs are bounded at their observed level, allowing the variable inputs to vary and fully utilized.

Capacity output can be estimated by solving a mathematical or linear programming problem. Following Fare *et al.* (1989), let there be $j = 1,\ldots J$ observations or firms in the industry, u is the vector of output, x is vector of input. The inputs include fixed inputs *(α)* and variable inputs (*á)*. There are m outputs and n inputs. The assumptions state that: First, each input is used by some firm, second, each firm uses some input and last, each firm produces some outputs ($u^j > 0$ for all j).

Following output-oriented DEA problem capacity output and the optimum or full input utilization values require solving the equation:

$\text{Max}_{\theta,\lambda,z}\ \theta_1$

Subjetc to

$$\theta_1 u_{jm} \le \sum_{j=1}^{J} z_j u_{jm} \qquad m = 1, 2, \ldots, M \qquad (1)$$

$$\sum_{j=1}^{J} z_j x_{jn} \le x_{jn} \qquad n \in \alpha \qquad (2)$$

$$\sum_{j=1}^{J} z_j x_{jn} = \lambda_{jn} x_{jn} \qquad n \in \alpha' \qquad (3)$$

$$z_j \ge 0 \qquad j=1,2,\ldots,J$$

$$\lambda_{jn} \ge 0 \qquad n \in \alpha'$$

(I)

Where z_j is the intensity variable for the j^{th} observation., λ_{jn} is the input utilization rate by vessel j of variable input n. θ_1 is a scalar measure of capacity or proportion by which output can be expanded when production is at full capacity production. Equation (1) represents constraint for each output. The equation (2) constraints the set of fixed factors and the equation (3) allows variable inputs to vary freely (in this case it implies that variable input is fully utilization).

The linear programming model (I) imposes a constant returns to scale (CRS) of production function. This means there is a linear relationship between inputs and output (Lindebo, *et al.*, 2007). In this case, we take into account that in the short run trawls can operate under variable returns of scale (VRS). So in the model (I), we impose the convexity constraint

$$\sum_{j=1}^{J} z_j = 1$$ (Madau, *et al.*, 2009).

In this approach, the capacity score, θ, that indicates the percentage by which the production of each output of each firm may be increased (i.e., the score measures the distance between the observed output and the frontier) is provided. θ is greater than or equal to one, and θ -1.0 indicates the percent by which the original output level can be expanded with no change inputs. For example, if the efficiency score is 1.5 it indicates that the capacity output is 1.5 times the current observed output and output can be expanded 1.5-1.0 = 0.5 or 50% with no change inputs. The CU is equal 1/1.5 = 0.67. Through DEA approach, the optimal utilization rate of the n^{th} available inputs for the j^{th} firm or the utilization of the variable inputs required to produce at full capacity output, λ_{jn}, is also provided (Vestergaard, *et al.*, 2003).

Capacity output is estimated by multiplying θ_1 by actual production, $\theta_1 u$. Base on the observe output, CU is calculated by:

$$CU(observed) = \frac{u}{\theta_1 u} = \frac{1}{\theta_1}$$ `

From this approach capacity output and CU are measured in the multiple output are expanded in fixed proportions relative to their observed values condition (Segerson and Squires, 1990). By keeping all output in fixed proportions the multiple-output problem is converted into single-product problem. This ray CU measure may be biased downward because as mentioned above the numerator used in this approach is observed output which may be inefficiently produced (may not be produced in a technically efficient manner). To obtain a technically efficient measure of outputs both variable and fixed inputs must be constrained to their current levels (Vestergaard, *et al.*, 2003). An unbiased of CU is obtained by dividing a technical efficiency of output by technical efficiency of capacity output. The technical efficiency score (θ_2) shows how much the production can be increased through using all inputs (fixed and variables inputs) efficiently may be determined by solving another linear programming problem:

$\text{Max}_{\theta,\, z}\ \theta_2$

Subject to

$$\theta_2 u_{jm} \le \sum_{j=1}^{J} z_j u_{jm} \qquad m = 1, 2, \ldots, M \qquad (4)$$

$$\sum_{j=1}^{J} z_j x_{jn} \le x_{jn}, \qquad n = 1, 2,\ldots, N \qquad (5)$$

$$z_j \ge 0 \qquad j=1,2,\ldots,J$$

(II)

The DEA model (II), equation (5) constraints the set of both variable and fixed inputs factors (i.e. model (II) adds an additional constraint with respect the model (I)). This implies that if the additional constraint is binding it should reduce the value of solution (i.e. $\theta_2 \le \theta_1$). Adding the convexity constraint to (II), one can estimate VRS TE (Madau, *et al.*, 2009).

The technically efficient output vector is calculated by multiplying θ_2 by observed production. The technically efficient (TE) is estimated as:

$$TE = \frac{u}{\theta_2 u} = \frac{1}{\theta_2}$$

The technically efficient or "unbiased" ray measure of CU then given by as:

$$unbiased \qquad CU = \frac{CU}{TE} = \frac{1/\theta_1}{1/\theta_2} = \frac{\theta_2}{\theta_1}$$

Solving the problem (I) will provide a measure of technically efficient, θ_1, which corresponds to full capacity production and problem (II) will provide a measure technically efficient, θ_2, which corresponds to technically efficient production given the usage of variable inputs (Kirkley, *et al.*, 1999).

5 Data

This analysis focused on the small-scale fisheries in the coastal waters of Nha Trang city. Data are collected in two communes, Vinh Truong and Vinh Luong. Data are collected from a survey of 65 small-scale trawlers in two years, 2005 and 2006. In that, 36 vessels were home ported in Vinh Truong, and 29 vessels were in Vinh Luong.

The survey was undertaken with independent random sample to obtain balanced panel of 65 small-scale trawlers. Since the data were collected through a personal household interview, a questionnaire was designed.

The catches were measured in term of thousand VNDs of landed fish and this value is the logical measurement for output when a multi-output approach is applied to fisheries (Alvarez A., 2001). Estimated capacity in this research is an economic capacity measurement and (I) linear programming problems reflect revenue maximization problem. Furthermore capacity utilization is interpreted as ratio between observed revenue of vessel *j* and maximum potential revenue (Lindebo, *et al*., 2007).

The input data used in analysis are divided into two kinds, fixed and variable factors. In the case of fisheries in a developing country like Vietnam, however, the information about biomass of the fish stock is unavailable or unreliable. In our case, there are two fleets fishing in two different grounds so the comparison of capacity or CU between them may provide some information on the state of fish stock. It may be interesting since an MPA was created and this may affect the trawlers in Vinh Truong, one of two areas that we investigate. However due to lack of data on biomass, we assume that all vessels operating in same area have same fish stock biomass and face the environment condition.

The fixed inputs usually used are the length of the vessel, the engine power and the gross tonnage. In this study, however, the data of gross tonnage is not available so the length (m) and the engine power (HP) of the vessel are used as fixed factors.

The variable input often used in the fisheries literature is the effort which is usually expressed in term of days at sea and crew size (Kirkley, *et al*., 2002). Besides, use of variable inputs such as fuel, ice, labour affects fishing capacity. For our analysis, days at sea, crew size per vessel, and fuel cost of vessel are used as variable inputs for the analysis.

6 Results

Table 1 shows estimated capacity, efficiency. Capacity score (θ1) and technical efficiency score (θ2) were the estimated scores obtained from DEA problems.

Table 1: Capacity and efficiency and SE measures of vessel

	Capacity (θ1)		Efficiency (θ2) VRS	
	2005	**2006**	**2005**	**2006**
Mean	1.903	1.649	1.217	1.144
St.dev	0.923	0.543	0.268	0.179

As mentioned in theory section, capacity is estimated under VRS hypothesis

$$\sum_{j=1}^{J} z_j = 1$$

From the table 1 the estimated capacity (measured under VRS hypothesis) is 1.903 in 2005 and 1.649 in 2006. It suggests that vessels could increase revenue by about 90% in 2005 and 65% in 2006 if they were operating at full capacity. The average CU-observed is 0.636 (2005) and 0.665 (2006) (table 3). This indicates that vessels were operating at less than full capacity given the set of fixed inputs (length and engine power).

Technical efficiency score is 1.217 (2005) and 1.144 (2006) under VRS hypothesis, which indicates that fishermen could increase revenue by 21.7% (2005) and 14.4% (2006) at the present state of technology by using their disposable fixed and variable inputs more efficiently.

Table 3: Average CU, number of vessels with CU equal or different to 1. (Ob-observed, ef/un - efficient/unbiased)

Vessel	2005		2006	
	CU-ob	**CU- ef/un**	**CU-ob**	**CU-ef/un**
Average	0.636	0.741	0.665	0.751
St.dev	0.25	0.24	0.19	0.20
CU =1	8	8	5	10
CU<1	57	57	60	55

In 2005 and 2006, the average CU-efficient was 0.741 and 0.751 with a standard deviation of 0.24 and 0.20, respectively (table 3). This means that there were 25.9 % (2005) and 24.9 % (2006) of capacity would not be used when fishermen operate at full capacity.

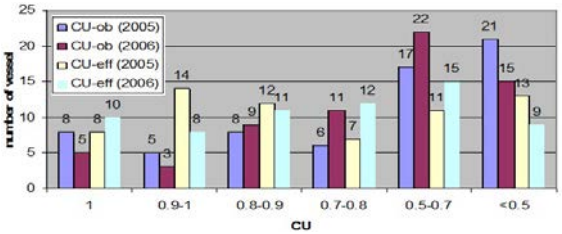

Figure 2: Distribution of capacity utilization scores in 2005 and 2006.

The distribution of capacity utilization scores for trawl vessels in Nha Trang are showed in figure 2. Of 65 vessels, 57 (57) vessels and 60 (55) vessels had a CU based on technical efficient production (based on observed production) less than 1 in 2005 and 2006, respectively (table 3). The number of vessels had a CU based on efficient production (CU-efficient) higher than 0.9 were 14 (2005) and 8 (2006). There was great number of vessels that had a CU less than 0.8, 43 and 47 vessels out of 65 in 2005 and 2006. Using the CU measure based on observed output (CU-observed), these numbers were 5 and 3 vessels had a CU higher than 0.9, 52 and 57 vessels had a CU less than 0.8 in 2005 and 2006, respectively (figure 2).

7 Discussions

From the capacity and CU information, it is showed that the fleet as a whole was not fully utilized. There was a great room of unused capacity for the small-scale trawlers in Nha Trang and many vessels were under-utilized to a high degree. The unused capacity is calculated by 1 minus CU. The existence of capacity under-utilization for trawlers in Nha Trang also implies that a smaller fleet if fully utilized could take the same level of harvest. As a result, a capacity under utilization may represent the existence of overcapacity in trawl fishery, at least in the short term.

While trawlers on average operate at the below full capacity utilization, the distribution of CU in trawl fishery in figure 2 can provide useful information for management. It can be seen that, many vessels operated at or nearly full capacity however a significant number of vessels operated at low levels of capacity. For vessels operating at or nearly full capacity, it would be impossible to increase their output above current levels. However, for other vessels with low level of capacity the latent capacity may exist if economic condition changed. As a consequence, the stock may be continuously fished down leading to the depletion of fish stocks.

Some policy implications:

This study is one of the first studies trying to measure fishing capacity of fishing fleets in Vietnam. The findings of this study may provide fishery managers with some policy implications.

Firstly, the Government should change traditional management methods, and have a comprehensive study on fishing capacity of fisheries in Vietnam as well as finding the way to reduce excess capacity. Managers need to have policies to support and create non-fishery livelihood opportunities by development other sectors such as aquaculture, agriculture and tourism as well as improve education of fishermen and local communities that will help reduce the cost for labour, capital, and numbers of fishing vessels join fishing. These results help to reduce overcapacity state in fishery, and protect marine resources.
Secondly, to reduce fishing pressure and overexploitation on coastal waters it is necessary to reduce the number of small fishing vessels, manage number of fishing vessels through a

vessel register from the nation to province level, promotion together with monitoring, control and surveillance (MCS) offshore fisheries for sustainable management purposes, and regulate coastal fishing activities in correspondence with current stock status in order to maintain and develop the fisheries in sustainable way.

Thirdly, improving economic efficiency in fishing has a significant important position. An overinvestment capital creates a surplus in inputs utilization and cause for low economic efficiency in fishery. Controlling the inputs used is necessary in controlling capacity. However, if limit on the inputs used is implemented alones, it may create opposite result. Besides, managers need to delete subsidisation on fuel and control the increase in number of fishing boats so as to match of fishing capacity and resources capacity

Lastly, the findings of study suggest that fishers can reduce overcapacity and increase revenue by using their resources more efficiently. We know that in fishing activity, output and productivity depend not only on fisher's ability, but also on the variable fish stock.

8 Conclusion

Although data for the output of each species were unavailable so the analysis cannot show some detailed information for management such as capacity, or CU, for each species but this study has provided an overview about capacity, CU of small-scale trawl fishery in Nha Trang. This study's results showed that, there were great unused capacity by vessel and most of vessels were under-utilized their capacity. Finding in this study provide a basis for future studies. By collecting more data of species, quantity of each species and some information of stock size the later studies will give better suggestions for policy-makers, fishermen and other industries stakeholders

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KAZIMIERZ TWARDOWSKI'S MODEL OF UNIVERSITY

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Abstract: The University occupies a special place in the social space, especially in the educational niche. Thus, it is obvious that the presence of reflection of this institution in all historical periods. On the ground of Polish science figure of Twardowski deserves the honored place. This great scholar enrolled permanently in the Polish thought not only philosophical, but also pedagogical, educational, sociological, etc.. This article organizes the thought sequentially around the figure of Twardowski, the dignity of the university, the idea of the university and the freedom of the university.

Keywords: Kazimierz Twardowski, university, idea of university, university freedom, dignity of university

Opening reflection

Reflection about university in each period of its functioning seemed to be present and closely reasoned. Since its establishment in the Middle Ages, and up to the current can be seen many interesting concepts that organize the functioning of the institutions, defining the cardinal tasks placed to university, designating its mission both in the autotelic, and the public dimension. Often the core of these concepts was the issue of freedom of the university and its interaction with other actors in the country. May therefore be seen that polar ideas either total autonomy and independence from any pressure in all university areas as well as visions of the university which is at the service of political ideology training passive, mediocre and faithful 'man-puppet'.
On the issue of freedom is inextricably coupled to the objective, which determines the action of university. In this matter also could indicate a lot of different approaches. However it is not the foundation of this work show the diversity of the foundation of the university in its multiplicity, but the narrowing of thought on the selected concept. Thus a further part of the paper will focus around the Kazimierz Twardowski's model of the university . However it should be noted immediately that the term "model" is used a little over exaggerated, since it is rather an ideal, an idea postulated and implemented by K. Twardowski during his entire academic life.

Kazimierz Twardowski's profile

At this point it appears advisable to recall a sketchy profile of Professor Twardowski. This is not a pointless procedure, because the story of his life had a significant impact on his views and approval of certain values.
Kazimierz (Jerzy Adolf ze Skrzypny Ogończyk) Twardowski was born on 20 October 1866 the year in Vienna and died on 11 February 1938 in Lvov. He is recognized primarily as a philosopher, psychologist and founder of the philosophical Lvov-Warsaw School. His extensive scientific interests included the history of philosophy, ethics, logic, epistemology, psychology, learning theory and pedagogy (also didactics)[1]. A significant moment in the life of Twardowski was a period of receiving education in Theresianum, an exemplary Viennese school, which were brought the sons of noble Austrian-Hungarian Empire to the prestigious position of civil servants. As Władyslaw Witwicki notes "In Theresianum teaching was at the highest level of didactics at that time, the strength of teaching and research resources were paramount, discipline military. Innate love of order, regularity, punctuality, to efficient organization must have the background of the school to develop and primed"[2]. Philosophical studies held under the direction of Franz Brentano, from whom took an interest in experimental psychology and special love for clarity and accuracy of philosophical thought. In the whole period of his activity K. Twardowski was moving in three areas: scientific, teaching and organizational. He perfectly connects theory with practice by acting to develop the national culture, popularize widely understood knowledge, and create and reform Polish education[3].
In 1904 he founded the Polish Philosophical Society *(Polskie Towarzystwo Filozoficzne, PTF*), which began to issue magazine Philosophical Movement (*Ruch Filozoficzny, RF*). He was also actively involved in various associations, such as: Copernicus Association (*Towarzystwo Kopernika*), Legal Association (*Towarzystwo Prawnicze*), Scientific and Literary Association (*Związek Naukowo-Literacki*) and the Association of Teachers of Higher Education (*Towarzystwo Nauczycieli Szkół Wyższych*) where in the years 1905-1911 he served as president. Furthermore, with full fervor courted women's equal access to education by participating in the activities of the Association of Private Female Secondary School[4]. In accordance with testimony of PTF members "he not evaded participation in any serious academic and scientific event, except that he participated in many other social activities (...). Thus he enjoyed unusual in Poland sincerely, reflected in numerous honors and dignities"[5]. He has great contribution to the education of a wide range of secondary school teachers and academics, who gave the tone of Polish education of the twentieth century (especially the philosophy and pedagogy)[6]. The main part of them is counted towards the philosophical and logical Lvov-Warsaw School. It is worth to recall some names, such as Kazimierz Ajdukiewicz, Tadeusz Czeżowski, Izydora Dąmbska, Mieczysław Kreutz, Maria and Stanisław Ossowski and Władysław Tatarkiewicz. In total, one could point at dozens of people belonging to that School[7].

Characteristic features of Twardowski's university model

K. Twardowski's thought about university is undoubtedly a synthesis of beautiful and exalted ideals of academic life. It is supported on a solid foundation of eclectic and widely profiled knowledge, not only of philosophy and psychology, but also of didactics, pedagogy, sociology, economics, etc.. It is impossible to highlight all areas of Twardowski's reflection in this paper, so I propose to focus around the selected nodal points. Towards this discussion I will focus successively on the dignity of the university, its purpose and freedom.
Truism seems to be the statement that the university is a special place for K. Twardowski. He emanates dignity, characterized by nobility and honor.Those nobleness is the result of centuries of proud tradition. The etymology of the term "university" is its roots in the Latin *universitas magistrorum et scholarium*, which means as much as a school community. Under the influence of the Renaissance period university name was converted to *universitas scientarium*, which clearly stressed being all sciences in various relationships[8]. It is worth remembering that the university since its establishment to the present is "(...) the symbol of European civilization and culture, »based on science«, which continued to be found even in modern European politics, assuming that »management should be based on knowledge«"[9]. Professor Twardowski understands university not as an ordinary education institution which gives the sufficient professional skills and elementary knowledge necessary for work. Rather it

[1] W. Szulakiewicz, *Działalność oświatowa i myśl pedagogiczna Kazimierza Twardowskiego* [w:] D. Drynda, D. Ekiert-Grabowska, W. Łuszczuk (red.) Historyczne źródła wybranych ofert edukacyjnych w Polsce współczesnej, Katowice 1996, 27 p. ISBN 83-226-0671-0

[2] W. Witwicki, *Kazimierz Twardowski* [w:] Przegląd Filozoficzny, rocznik 23/1920, IX p. ISSN 0035-9599
[3] W. Szulakiewicz, *Działalność…*, 27 p. ISBN 83-226-0671-0
[4] W. Szulakiewicz, *Działalność…*, 28-29 p.
[5] Polskie Towarzystwo Filozoficzne, *Przedmowa* [w:] K. Twardowski, Wybrane pisma filozoficzne, Warszawa 1965, VII p. no ISBN number
[6] J. Didier, *Słownik filozofii*, Katowice 2006, 415 p. ISBN 83-7132-850-8
[7] J. Woleński, *Tadeusz Czeżowski i Szkoła Lwowsko-Warszawska* [w:] Ruch Filozoficzny, nr 4/2009, 647-649 p. ISSN 0035-9599
[8] T. Czeżowski, *O uniwersytecie i studiach uniwersyteckich*, Toruń 1946, 8 p. no ISBN number
[9] D. Hejwosz, *Edukacja uniwersytecka i kreowanie elit społecznych*, Kraków 2010, 73 p. ISBN 978-83-7587-271-2

constitutes a kind of “sanctuary”, or even special respect place located high above the everyday public life[10]. It is possible to say that is the last, or at least one of the last bastions of the highest values understood in a universal way. The University is not also a dead creature, only a building because it is formed by people in both students and professors.

The university has to fulfill the important task expressed as: "(...) to acquire scientific truths and probabilities and to foster the skills of their inquiry"[11]. It should be emphasized that, for Twardowski truth is universal and therefore absolute, not relative, nor depend on the circumstances. However the objectivity of truth as intellectual value is not in conflict with its multi-dimensional social reception. For this reason, unfortunately, it happens that there is no shortage of often intentional distortions and convenient ways to interpret it. Professor Twardowski also accurately referred to the road leading towards the truth. W. Witwicki mentioned that: "In all large and small scientific papers of Twardowski dominates an essential tone desire to remove the dregs and misunderstandings which entails multiple meanings of words and phrases (...)"[12]. Tadeusz Kotarbiński also points out this area when he writes that: "The effort of thought of Twardowski was constantly and inseparably coupled with concern for the clear and precise denunciation thereof (...)"[13]. Twardowski himself was not limited in this matter only to the words, but his own life gave a clear testimony that this ideal is possible to implement.

Speaking about the important role of university in the social reality Professor Twardowski refers to the metaphor of a lighthouse which illuminates the path of ships on a stormy sea, becoming the guiding star for sailors sailing in unknown waters[14]. University is therefore identified with compass or gyroscope by which man knows which way should follow in the life. In fact a human being should be independent and responsible for themselves and others rather than being raised on the surface and depending on the current water daphina. Kazimierz Twardowski model of the university assumed inseparable combination of learning and teaching in the common search for truth by the master and his disciples. However, the latter could not limit itself only to *mimesis*, but in independent and critical way follow the master. Should also be noted that according to Twardowski’s university service is not restricted to paying homage to science, but is also acting for society. Noticeable is therefore clear similarity of Twarowski's vision for German concept of Wilhelm von Humboldt.

Surely will not be a mistake specify Twardowski as an advocate of academic freedom. Indeed, it seemed a matter of fact that "the opportunity to compliance appropriate tasks of University is determined by the absolute spiritual independence"[15]. Such claim is not just wishful thinking of an idealist because is reflected in the idea of the university. Stanisław Litak clearly notes that "universities from the beginning had three main privileges: autonomy, monopoly of award scientific degrees and the right to strike"[16]. Similarly, postulates Michał Seweryński, arguing that academic freedom defines university. Hendrikus Theisens puts forward three dimensions distinguish the university from other institutions of higher education: first, the university enjoys autonomy with respect to the external environment and to a smaller extent than vocational schools become social trends, secondly, the position of academics in the universities is very high and privileged the administration and the third, the organization of the university takes the form of a unique construct, and requires from government a specific treatment[17]. Also, the content of modern law on higher education in Poland contains a provision that "universities are guided by the principles of freedom of teaching, research and artistic creation"[18], which will have gained the acceptance of Professor Twardowski.

It is thus clear that from the moment of his birth into university was registered requirement of his freedom. Nevertheless, Twardowski was aware that the guarantee of full liberty at the university is not possible. Already during his contemporaries universities struggled with financial difficulties, being at least partially dependent on state subsidies or private companies. However, he expressed the stern indignation of the principle ”he who pays the piper calls the tune” (pol. *płacę więc wymagam*). He proved its case by the words from already quoted speech at University of Poznań, on the occasion of granting the honorary doctoral degree: "(...) those who endow and maintain universities will prove complete misunderstanding the essence of University, if they wanted to hinder in anything his work, stipulate against some of his research results, indicate that the results would be desirable"[19]. Scientific research can develop only if their epistemological perspective is not locked nor restricted, and the ontological perspective is not conditionality of its own existence. Can be assumed that Twardowski did not mean absolute freedom in everything, because this is nothing but anarchy because the range of freedom of one entity, overlaps with the range of freedom of another, thereby depriving him of liberty. Twardowski opposed the danger to the sovereignty of the university "(...) first, promotion of a political party (pol. *partyjniactwo*), which demanded that universities engage in beneficial shares for each party (with which had to do during the First World War as president of the university), and second, Church, overly influential in Poland, who wanted to impose on academic life its scale of values"[20]. He expressed the claim that into university should be a kind of asylum, free from the pressures of self-interested subjects. Twardowski wrote as follows: the university "must isolate itself from everything that is not acquiring of scientific truth, and must observe proper distance between itself and the mainstream, which is speeding around the walls of everyday life, the clamor of conflicting currents of social, economic, political and any other”[21].

Twardowski's reflection about university did not "die" with him, but was taken and even exponentially developed by his students. Tadeusz Czeżowski in Philosophical readings (pol. *Odczyty filozoficzne*) recalls his master as follows: "(...) His spirit lives in us and, like the physical life is not locked in the doctrine, but he went ahead in the first row with the progress of thought, so also today, takes more and more new forms that generate the Polish philosophical thought"[22].

Concluding collect thoughts

Kazimierz Twardowski in his views and actions certainly contributed the in building the image of the university and the academic. The memoirs of his students clearly shows that the requirements posed were high, but able to satisfy what he would be an example. He noticed special dignity in university, exaltation, because he was aware of the important task of this institution. Passionately defended the equality of access to knowledge and clarity in its meaning. In a word, he professed *ethos* “the university as a temple” and the bastion of the greatest values. Certainly no one would deny that such a vision the university is materialization of noble ideas and a kind of ideal type. This is not a novelty in the world reflect on the institution. Similar concepts (at least in part premises) can even find in Fichte, Schelling, Schleiermacher, Jaspers or Humboldt. Can be tempted to question which especially in modern times seems to be justified: is the university K. Twardowski's feasible today? Today, more and more loudly heard shouts calling for resignation of fossilized traditional university, the apotheosis of narrowly-specialized education, the rejection of philosophy, focus on the criterion of profitability and economic short-

[10] W. Tyburski, *Tadeusz Czeżowski o etosie uczonego i zadaniach uniwersytetu* [w:] Ruch Filozoficzny, nr 4/2009, 656 p. ISSN 0035-9599
[11] K. Twardowski, *O dostojeństwie uniwersytetu* [w:] K. Twardowski, Wybór pism psychologicznych i pedagogicznych, Warszawa 1992, 462 p. ISBN 83-02-04473-3
[12] W. Witwicki, *Kazimierz Twardowski*…, XIII p.
[13] T. Kotarbiński, *O Kazimierzu Twardowskim* [w:] K. Twardowski, Wybrane pisma filozoficzne…,V p. no ISBN number
[14] K. Twardowski, *O dostojeństwie*…, 464-465 p.
[15] K. Twardowski, *O dostojeństwie*…, 464 p.
[16] S. Litak, *Historia wychowania*. t. I, *Do wielkiej rewolucji francuskiej*, Kraków 2004, 63 p. ISBN 83-7318-398-1
[17] D. Antonowicz, *Uniwersytet przyszłości. Wyzwania i modele polityki*, Warszawa 2005, 32-33 p. ISBN 83-89817-40-3
[18] Ustawa z dnia 27 lipca 2005 r., *Prawo o szkolnictwie wyższym*, art. 4.2.
[19] K. Twardowski, *O dostojeństwie*…, 464 p.
[20] S. Borzym, *Uniwersytet według Twardowskiego* [w:] Kronos: metafizyka, kultura, religia, nr 1/2011, 265 p. ISSN 1897-1555
[21] K. Twardowski, *O dostojeństwie*…, 464 p.
[22] T. Czeżowski, *W dziesięciolecie śmierci Kazimierza Twardowskiego* [w:] T. Czeżowski, Odczyty filozoficzne, Toruń 1958, s. 16, no ISBN number

sightedness. As Martin Heidegger would say, *it is said impersonally* (pol. *mówi się*) that today knowledge may be useful for guaranteeing measurable results and in university like in the shopping arcade client can stock up on necessary documents "proving skills." A bad explanation for present time do not give chance to the university, which he is condemned to fail in the face of bureaucratic machine because the period of the Twardowski's also cannot be counted as qualify to educational reform. However, Professor Twardowski's life clearly demonstrates that adherence to ideals do not have to close within the world of theory or fantasy, and may be excreted to the real universe and their steadfast strength of impact on the reality of making it less gray and just any.

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THE APPLICATION OF DIFFERENT SYNTHETIC MEASURES FOR STANDARD OF LIVING MEASUREMENT

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Abstract: The synthetic variable is one of the methods to examine differences in the standard of living among countries. The synthetic variable allows to replace the whole set of variables into one aggregated variable. This variable is the basis for organizing and grouping countries in terms of standard of living. In the literature one can find various aggregation methods. The purpose of this article is to show, how the application of chosen method of creating the synthetic measure affects the final result of ordering and grouping objects.

Keywords: synthetic measure, comparative analysis, standard of living.

1 Introduction

Nowadays the standard of living has an increasing role in the European Union integration process. Without doubts there is a need to analyze the standard of living issue because it is a source for defining goals and measuring the effectiveness of social policy. The standard of living is a multidimensional and interdisciplinary category thus it is hard to define and quantified it in a direct manner. In this paper the definition proposed by Bywalec and Wydmus [1992] has been used – by standard of living we can understand the level of wealth, comfort, material goods and necessities available to a certain socioeconomic class in a certain geographic area.

The synthetic variable is one of the methods that can be used to describe changes in the standard of living. It allows to indentify and measure the spatial differentiation among given objects. In this article four different methods of creating the synthetic variable were presented. The study was carried out for European Union countries with the exception on Cyprus, Malta and Luxemburg. The empirical material was taken from databases published by Eurostat, Euromonitor and the World Health Organization.

To construct the synthetic variables 35 diagnostic variables have been used (see table 1). All those variables according to formal and essential conditions are crucial to describe the studied phenomenon. Synthetic variable allows to transform the units described by many variables into the one-dimensional space. Results of analysis allowed to compare the effects of ordering and grouping countries received by using different aggregation method.

2 Different proposals of synthetic variable construction

There are variety of methods for creating a synthetic variable, for instance: Hellwig [1968], Cieślik [1974], Strahl [1978], Grabiński [1992], Grabiński, Wydmus and Zeliaś [1993], Zeliaś and Malina [1997] and so on. In this paper, four chosen methods have been briefly described.

2.1 Taxonomic measure of development proposed by Hellwig

In this method we are looking for an "ideal object" which is described as:

$$y_{oj} = \max_i y_{ij};\ j \in S$$

$$y_{oj} = \min_i y_{ij};\ j \in D$$

The ideal coordinates of object are the maximum value if a variable is stimulant (the higher the value of analyzed variable, the better the studied issue is evaluated) or the minimum value if a variable is destimulant (the lower value of analyzed variable, the better the studied issue is evaluated).

Table. 1. The set of variables

Symbol	Variables
1. Population	
$X_{1,1}$	Total fertility rate
$X_{1,2}$	Demographic dependency ratio of elderly people (in %)
2. Labour market and job security	
$X_{2,1}$	Unemployment rate (in %)
$X_{2,2}$	Number of deaths due to accident at work per 100 000 inhabitants
3. Health and social care	
$X_{3,1}$	Number of deaths due to cancer per 100 000 inhabitants
$X_{3,2}$	Number of deaths due to diabetes per 100 000 inhabitants
$X_{3,3}$	Number of new AIDS cases per 100 000 inhabitants
$X_{3,4}$	Number of doctors per 100 000 inhabitants
$X_{3,5}$	Number of nurses per 100 000 inhabitants
$X_{3,6}$	Number of hospital beds per 100 000 inhabitants
$X_{3,7}$	Obese population (BMI 30kg/sq m or more) as a percentage of population aged 15+
4. Education	
$X_{4,1}$	Number of university students per 1000 inhabitants
$X_{4,2}$	Number of academic teachers per 1 student
5. Recreation, culture and leisure time	
$X_{5,1}$	Annual cinema trips per capita
$X_{5,2}$	Number of hotels per 1000 inhabitants
6. Living conditions	
$X_{6,1}$	Number of newly built dwellings per 1000 households
7. Transport and communication	
$X_{7,1}$	Number of newly registered cars per 1000 inhabitants
$X_{7,2}$	Length of expressways in km per 1 sq km of land
$X_{7,3}$	Proportion of paved roads as a percentage of total road network
$X_{7,4}$	Density of road network in km per 1 sq km of land
$X_{7,5}$	Length of public railway network operated per 1000 sq km of land
$X_{7,6}$	Number of mobile phones subscribers per 100 inhabitants
$X_{7,7}$	Railway passenger traffic in million passenger-km per 1000 inhabitants
$X_{7,8}$	Airline passenger traffic in millions of passenger-km per 1000 inhabitants
8. Social security	
$X_{8,1}$	Number of suicides and self-harm per 100 thousand inhabitants
$X_{8,2}$	Number of divorces per 1000 inhabitants
$X_{8,3}$	Number of crimes per 100 000 inhabitants
9. Population incomes and expenditures	
$X_{9,1}$	Annual average rate of inflation (in %)
$X_{9,2}$	Gross domestic product per capita in USD
$X_{9,3}$	Household saving as % of disposable income
10. Degradation and protection of the environment	
$X_{10,1}$	Sulfur oxides emissions in kg per capita
$X_{10,2}$	Nitrogen oxide emissions in kg per capita
$X_{10,3}$	Carbon monoxide emissions in kg per capita
$X_{10,4}$	Nationally protected areas as a percentage of land
$X_{10,5}$	Forest land as a percentage of land

Source: Author's own study

When we have the coordinates of the model object we are looking for the distance between this object and given countries using Euclidean distance:

$$c_{io} = \left[\sum_{j=1}^{n}\left(z_{oj} - z_{ij}\right)\right]^{1/2}$$

where:

c_{io} - Euclidean distance between country z_{ij} and an "ideal object" z_{oj},

z_{oj} - coordinates of an "ideal object",

z_{ij} - normalized value of the j-th variable on object i, according to formula:

$$z_{ij} = \frac{x_{ij} - \overline{x_j}}{s_j}$$

where:

x_{ij} – real value of the j-th variable on object i,

$\overline{x_j}$ - mean value of the j-th variable,

s_j - standard deviation of j-th variable.

The synthetic variable is calculated using formula:

$$d_i = 1 - \frac{c_{io}}{c_o}$$

where

d_i - taxonomic measure of development proposed by Hellwig

c_{io} - Euclidean distance between country z_{ij} and an "ideal object" z_{oj} ,

c_o - critical distance between objects and an "ideal object" z_{oj} ,

$$c_o = \overline{c_o} + 2s_d$$

$$\overline{c_o} = \frac{1}{n}\sum_{j=1}^{n} c_{io}$$

$$s_d = \left[\frac{1}{n}\sum_{j=1}^{n}\left(c_{io} - \overline{c_o}\right)^2\right]^{1/2}$$

2.2 Absolute measure of development proposed by Cieślik

In Cieślik's method we are not looking for any ideal object. Countries are ordered on the basis of the value of attributes and average variation between objects, expressed by the standard deviation. To build the synthetic variable we use the formula:

$$d_i = \sum_{j=1}^{n} x_{ij}^{'}$$

where:

d_i - absolute measure of development proposed by Cieślik,

$x_{ij}^{'}$ – normalized value of the j-th variable on object i .

$$x_{ij}^{'} = \frac{x_{ij}}{s_j}$$

2.3 Synthetic variable proposed by Strahl

Also in Strahl's method we are not looking for any ideal object. The synthetic variable is built using following formula:

$$d_i = \sum_{j=1}^{n} x_{ij}^{'} = \sum_{j=1}^{n} x_{ij}^{'S} + \sum_{j=1}^{n} x_{ij}^{'D}$$

where:

d_i - synthetic variable proposed by Strahl,

$x_{ij}^{'}$ – normalized value of the j-th variable on object i ,

$x_{ij}^{'S} = \frac{x_{ij}}{\max x_{ij}}$ if a variable is a stimulant,

$x_{ij}^{'D} = \frac{\min x_{ij}}{x_{ij}}$ if a variable is a destimulant.

2.4 Synthetic variable proposed by Zeliaś and Malina

The matrix of standardized diagnostic variables is the basis for the construction of a synthetic variable according to the formula:

$$d_i = \frac{1}{p}\sum_{q=1}^{p} z_{iq}$$

where:

d_i – synthetic variable value for country i ,

z_{iq} – synthetic variable value for country i calculated on the base of variables belonging to group q ,

p – number of groups.

Creation of a synthetic variable proceeded as follows:

- calculation the synthetic variable for a given group as a mean of the standardized variables,
- construction the synthetic measure according to given formula as a mean of synthetic variables calculated for each group.

3 The standard of living measurement

Synthetic varaibles describing the standard of living in the European Union countries were calculated using all methods mentioned in section 2. Table 2 shows values of synthetic variables for each method and position of each country according to achived standard of living. Calculated values of synthetic variable describing the standard of living in chosen European Union countries are the basis to order these countries from best to worst in terms of the studied phenomenon. The grades were given to each country, in such a way that a rank 1 represents the country with the highest value of the synthetic variable, and a rank 24 represents the country with the lowest value of the variable.

Table. 2. Values of synthetic variables for European Union countries and position of each country according to achived standard of living.

Country	Method proposed by							
	Hellwig		**Cieślik**		**Strahl**		**Zelias & Malina**	
	d_i	rank	d_i	rank	d_i	rank	d_i	rank
AT	0,704	*3*	49,943	*4*	0,711	*3*	0,614	*3*
BE	0,651	*14*	44,558	*15*	0,586	*15*	0,528	*13*
BG	0,616	*22*	38,403	*24*	0,493	*24*	0,432	*24*
DK	0,674	*9*	49,116	*5*	0,662	*7*	0,575	*7*
EE	0,645	*15*	44,172	*16*	0,568	*17*	0,478	*18*
FI	0,665	*11*	48,875	*6*	0,640	*12*	0,541	*12*
FR	0,670	*10*	47,955	*10*	0,650	*10*	0,594	*5*
GR	0,683	*6*	48,574	*8*	0,673	*6*	0,571	*8*
ES	0,715	*2*	48,494	*9*	0,692	*4*	0,613	*4*
NL	0,696	*4*	54,786	*2*	0,724	*2*	0,624	*2*
IE	0,853	*1*	62,887	*1*	0,888	*1*	0,773	*1*
LT	0,622	*21*	41,279	*19*	0,509	*22*	0,437	*23*
LV	0,614	*24*	39,632	*22*	0,502	*23*	0,443	*22*
DE	0,676	*8*	47,348	*11*	0,654	*8*	0,570	*9*
PL	0,636	*19*	43,595	*17*	0,570	*16*	0,503	*17*
PT	0,642	*17*	39,553	*23*	0,530	*20*	0,470	*20*
CZ	0,653	*13*	45,180	*14*	0,600	*14*	0,521	*14*
RO	0,616	*23*	40,687	*21*	0,531	*19*	0,472	*19*
SK	0,644	*16*	45,347	*13*	0,608	*13*	0,517	*15*
SL	0,638	*18*	41,361	*18*	0,564	*18*	0,516	*16*
SE	0,663	*12*	48,602	*7*	0,644	*11*	0,551	*11*
HU	0,624	*20*	40,878	*20*	0,518	*21*	0,450	*21*
UK	0,690	*5*	50,210	*3*	0,689	*5*	0,583	*6*
IT	0,682	*7*	46,219	*12*	0,651	*9*	0,567	*10*

Source: Author's own study.

On the basis of previous considerations, the classification of EU countries has been made. To create the synthetic measure the variable interval was built using mean $\overline{d}$ and the standard deviation s_d . Groups were formed as follows:

- group I (high quality of life): $d_i > \overline{d} + s_d$,
- group II (medium quality of life): $\overline{d} + s_d > d_i > \overline{d}$,
- group III (low quality of life): $\overline{d} > d_i > \overline{d} - s_d$,
- group IV(the lowest quality of life): $d_i < \overline{d} - s_d$

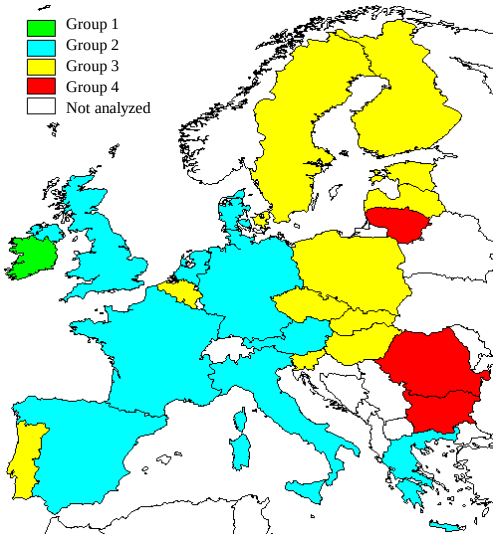
The results of grouping countries are presented in table 3 and figure 1.

Table 3.Countries clustering.

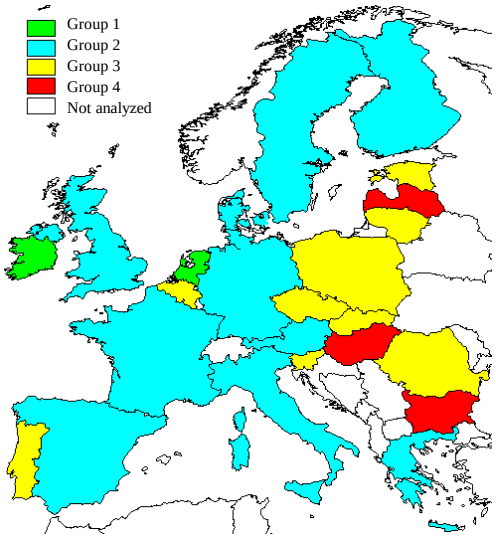
Group no.	Method proposed by			
	Hellwig	**Cieślik**	**Strahl**	**Zeliaś and Malina**
Group I	IE	IE, AT, NL	IE, NL	IE, NL
Group II	AT, DK, FR, GR, ES, NL, DE, UK, IT	DK, FR, GR, ES, DE, UK, IT, FI, SE	AT, DK, FR, GR, ES,DE, UK, IT, FI, SE	AT, DK, FR, GR, ES, DE, UK, IT, FI, SE
Group III	BE, EE, FI, LT, PL, PT, CZ, SK, SI, SE, HU	BE, EE, PL, PT, CZ, SK, SI, RO	BE, EE, PL, PT, CZ, SK, SI, RO	BE, EE, PL, CZ, SK, SI, RO, LT, HU
Group IV	BG, LV, RO	LT, HU, BG, LV	LT, HU, BG, LV	PT, BG, LV

Source: Author's own study.

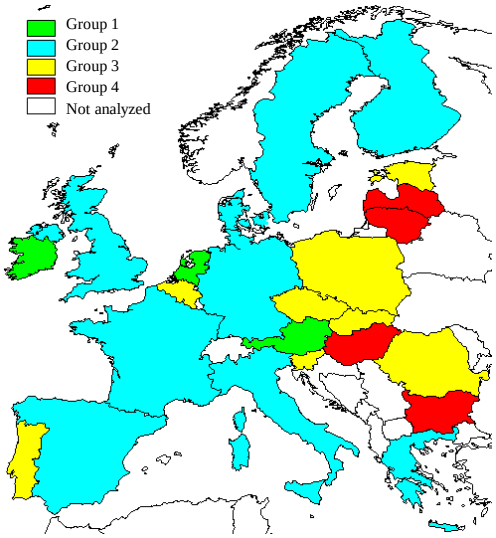
Method proposed by Hellwig



Method proposed by Cieślik



Method proposed by Strahl



Method proposed by Zeliaś & Malina

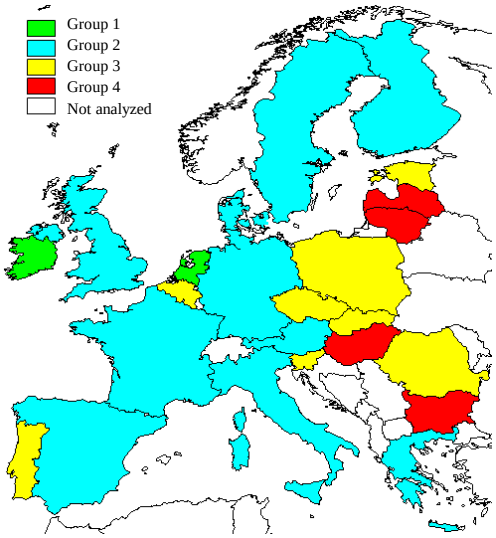


Figure 1. Countries clustering using different aggregation methods.
Source: Author's own study.

4 The comparison of presented methods

4.1 Spearman rho

In order to verify concordance between two linear orders the Spearman rho was calculated [B. Monjeardet], according to formula:

$$r = 1 - \frac{6\sum_{i=1}^{n} d_i^2}{n\left(n^2 - 1\right)}$$

where:
r – Spearman rho,
$d_i = r_{1i} - r_{2i}$,
r_{1i} – rank of i th unit in the first ranking,
r_{2i} – rank of i th unit in the second ranking,
n – number of units.

Table 4. Values of Spearman rho comparing the ordering of the European Union countries.

	Hellwig	Cieślik	Strahl	Zeliaś & Malina
Hellwig	-----	0,900	0.968	0,951
Cieślik		----	0,942	0,926
Strahl			----	0,979
Zeliaś & Malina				----

Source: Author's own study

Afterwards the statistical significance of the correlation coefficient has been examined using t-student statistic. For all the values presented in table 4 there is a relationship $t_{(n-2)} > t_{\alpha}$ so the null hypothesis is rejected, therefore Spearman rho is statistically significant for $\alpha = 0.01$. This means that there is a high correlation between rankings of EU countries. As we can see in table 4 the highest correlation of results we achieve using methods proposed by Strahl and Zeliaś & Malina. The biggest differences are between method proposed by Hellwig and Cieślik. No matter which method was used Ireland was at the

first plane in the ranking. Country with the lowest standard of living according to three methods was Bulgaria.

4.2 Cramer's V

Earlier analysis shows that results of clustering in all methods are very similar. However we should conduct a detailed analysis of accuracy in results obtained by these four methods. For this purpose, contingency tables were constructed and values of Cramer's V were calculated [Grabiński, Wydmus, Zeliaś, 1983].

$$v = \sqrt{\frac{\chi^2}{m \cdot \min\{(r-1),(s-1)\}}}$$

where:

m – number of objects,

r and s – size of the contingency table,

χ^2 - value of chi-square statistics, calculated as:

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{s}\frac{(m_{ij} - \hat{m}_{ij})^2}{\hat{m}_{ij}}$$

where:

m_{ij} - values calculated inside the contingency table,

$\hat{m}_{ij}$ – theoretical values, calculated as:

$$\hat{m}_{ij} = \frac{m_{i.}m_{.j}}{m_{ij}}$$

where:

$m_{i.}m.j$ - boundary elements of the contingency table.

Cramer's V is defined between $\langle 0,1 \rangle$, wherein the coefficient is closer to unity, the higher accuracy of the results. Table 5 contains the calculated values of Cramer's V for the classification results by all methods. Cramer's V calculated according to the above mentioned formula is compared to the threshold value V*= 0.485. If the calculated value of Cramer's V exceeds the threshold value, this means that there is agreement in the classification between two methods. Analyzing the results from the table 5 we can see a high accuracy of the results.

Table 5. Cramer's V value between results obtained using different aggregation methods.

	Hellwig	Cieślik	Strahl	Zeliaś & Malina
Hellwig	-----	0,698	0.619	0,665
Cieślik		----	0,753	0,893
Strahl			----	0,877
Zeliaś & Malina				----

Source: Author's own study

As we can see at table 5 the biggest differences in clustering countries can be observed when we compare method proposed by Hellwig and Cieślik. Hellwig's method is the one with the lowest correlation with other methods. The average Cramer's V value for Hellwig's method is only 0,661- it is still bigger than V*=0,485 but the agreement in the classification is not so high.

5 Conclusions

- Based on the Spearman rho we can see that all aggregation methods gives very similar results. Thus their usage do not significantly affect the resutls of ordering countries due to the standard of living.
- The differences in ranking usually oscillate between +/- 2-3 position.
- Based on Cramer's V value we can see that presented aggregation methods gives similar clusteris results. The lowest correlation is observed in Hellwig's method. In Hellwig's method Ireland was the only country clasiffied in group I, however in onther methods to the first group belongs also Netherlands. Using Hellwig's method Finland was classified in group III, but other methods place Finland in gropu II. Also Romania has lower position in Hellwig's clustering than in ohter methods. Even thought the usage of different aggregation methods do not significantly affect the result of clustering countries due to the standard of living.
- Considering the standard of living measurement the highest position in the entire set belongs to Ireland – this was confirmed by all clasiffications. The lowest standard of living in Bulgaria was confirmed by three of the four clasiffications.
- It seems that the best method to construt the synthetic varaible for the standard of living measurement is the method proposed by Zeliaś and Malina. It was shown in this paper that this method has the highest avarage correlation with other methods and it is also relatively easy to calcuatle and interpret.

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Primary Paper Section: A

Secondary Paper Section: H, O

EU CONSUMER PROTECTION IN THE CIVIL PROCEEDING

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Abstract: The consumer protection is one of the priorities of the EU internal market. The pressure on the growth of the competitiveness motivates some businessmen to use unfair practices especially against those, who are usually not informed on the market situation very well. Therefore the EU law maker adopted the minimum standard of the consumer protection, which is valid in all EU member states. The Council Directive 93/13/EEC names some terms used in the consumer contracts, which could be considered as unfair. If there is a proof of their unfair character, it is the role of the national courts to ensure these terms are not binding on the consumers. The Court of Justice of the EU asks the national courts to take into account the unfair terms of the consumer contracts by virtue of office. The Slovak execution courts misuse this power when stopping the proceeding due to pure existence of an arbitration clause in a consumer contract.

Keywords: consumer, unfair terms, national courts, Court of Justice of the EU.

Introduction

The European Union is an international organization established on the economic integration. Its main objective is to create an internal market of the free movement of goods, services, persons and capital without borders among the member states. Therefore it is necessary to ensure the free economic competition among the market subjects with clear defined legal rules. The market competition is even harder and the producers of goods and the providers of services need to increase their competitiveness by the more qualitative outputs and pressing down their costs. The hard competition tempts the businessmen to various unfair practices, especially against the market subjects who are less informed on the market situation, have less skills and knowledge on the prices, quality of products and competitive products; also against consumers buying the goods and services for their own needs, or needs of their family members. With the aim to eliminate these unfair practices of businessmen and to restore the balance between the rights and obligations in the private contracts, the consumer policy has become one of the policies on the EU internal market. Furthermore, the article 38 of the Charter of fundamental rights of the EU inserts the consumer protection to the human rights and freedoms. According to this article *Union policies shall ensure a high level of consumer protection*. The Treaty on the Functioning of the European Union enables to adopt the legal rules related to the consumer protection on the supranational EU level (art. 169 TFEU). The system of the consumer protection "*is based on the idea that the consumer is in a weak position vis-a-vis the seller or supplier, as regard both his bargaining power and his level of knowledge. This leads to the consumer agreeing to terms drawn up in advance by the seller or supplier without being able to influence the content of those terms.*"[1] This imbalance between a consumer and a seller/supplier should be restored by the cogent legal rules adopted by the EU law maker. These EU legal rules include the minimum standards of the consumer protection respected in all EU member states but the national law makers can adopt the stricter legal rules while they are conformed to the EU law. The consumer does usually not know the national law of other member states and the fear of the foreign law could be a barrier of the cross border business transactions. The EU law has introduced the supranational minimum standard of the consumer protection valid in all EU member states to develop the cross border activities without fear of the foreign legislations. The minimum standard is stipulated in the EU secondary law; one of the most important EU laws is the Council Directive 93/13/ECC on unfair terms in the consumer contracts. This Council Directive names the terms which will be considered as unfair if their unfair character is proven. Then there is a role of the EU member states to ensure these terms will not be binding on the consumers. It is the cogent rule, which "*taking into account the weaker position of one of the parties to the contract, aims to replace the formal balance which the latter establishes between the rights and obligations of the parties with an effective balance which re-establishes equality between them.*"[2]

1 Consumer in the EU law and the Slovak law

According to article 2b) the Council Directive 93/13/EEC on unfair terms in consumer contracts, a consumer means *any natural person who, in contracts covered by this Directive, is acting for purposes which are outside his trade, business or profession.* The article 2a) of Directive of the European parliament and Council 2005/29/EC defines a consumer as *any natural persons who, in commercial practises covered by this Directive, is acting for purposes which are outside his trade, business, craft or profession*. Many other Directives of the European Union define a consumer only as a natural person, not legal entity. Some doubts on the status of a consumer as a natural person result from the Council regulation 44/2001 on jurisdiction and the recognition and enforcement of judgements in civil and commercial matters (Brussels I). According to the article 15 of this regulation a consumer is *a person, who concludes a contract for the purpose which can be regarded as being outside his trade or profession*. Rozehnalová and Týč[3] stated that it is related to the natural persons as well as legal entities; because the regulation takes into account the specific conditions of the national legal regulations of the Scandinavian countries. In these countries, consumer is a natural person as well as a legal entity, mainly various NGOs (such as civil associations, foundations, interests associations etc.), which do not have skills and information in the same level as the sellers or suppliers, who are acting for purposes relating to their trade, business or profession.

The Slovak law has two legal definitions of the consumer. The first one is in the Civil Code; § 52 (4) of this Code defines a consumer as a natural person, who concludes a contract for the purpose which is outside his trade or professional activities. The second one is in the law no. 250/2007 Coll. on consumer protection. According to the § 2a) of this law, a consumer is not only a natural person but also a legal entity, who buys goods and uses services for personal needs or needs of members of his/her household.

The EU law maker prefers a consumer as a natural person in the most of cases, but it reserves this issue on the member states in the case of the jurisdiction according to the Brussels I. because of maintenance of the right to the fair trial if some member states consider a consumer also as a legal entity. However, the various definitions in the legislation of the one member state may result in many misunderstandings. The Civil Code of the Slovak republic stipulates that a consumer is only a natural person; the law on consumer protection determines a consumer moreover a legal entity. According to the § 3 (3) of this law (no. 250/2007 Coll.) any consumer (also a natural person as well as a legal entity) buying goods or using services for personal needs or needs of the members of his/her household has the right for protection against the unfair terms in the consumer contracts according to the § 52-54 of the Slovak Civil Code. However, the Slovak Civil Code and the Council Directive 93/13/EEC do not include a legal entity into the legal consumer protection. Therefore there is a question if some legal entities have the rights to claim the unfair terms according to the Slovak Civil Code and this Council Directive as well. The legal rules of the § 3 (3) and

[1] Judgement of the Court of Justice of the EU dated 26.10.2006 in case C-168/05 Elisa Maria Mostaza Claro v. Centro Móvil Milenium SL (25)

[2] Judgement of the Court of Justice of the EU dated 26.10.2006 in case C-168/05 Elisa Maria Mostaza Claro v. Centro Móvil Milenium SL (36)

[3] ROZEHNALOVÁ, N. – TÝČ, V. 2006. *Evropský justiční prostor (v civilních otázkách).* Brno: Masarykova univerzita, 2006, p. 97-98

the § 2a) of the law no. 250/2007 Coll. are contrary to the § 52 (4) of Slovak Civil Code. In addition, the definition of a consumer in the law no. 250/2007 Coll. is controversial because of personal needs of a legal entity including the personal needs of the members of its household. For comparison, the Czech legal regulation stipulates a consumer only as a natural person, who is acting outside his/her trade or profession. Finally the Court of Justice of the EU decided "*the term consumer, as defined in Article 2(b) of Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts, must be interpreted as referring solely to natural persons.*"[4]

2 Consumer contract

According to the § 52 of the Slovak Civil Code, a consumer contract is any contract regardless the legal form, which is concluded between a consumer and a businessmen acting within his/her trade or profession. It is not a new form of the typical contracts regulated by the Civil Code or the Commercial Code but it is any typical (such as purchase contract, rent contract or contract for work) or any atypical contract (not regulated directly by the named Codes), which one of the contract parties is a consumer within the meaning of the § 52 (4) of the Slovak Civil Code. *A contrario* a purchase contract or a contract for work is not a consumer contract if both contract parties are only businessmen or only consumers.

A consumer contract is different from the "classic" contract by the fact that the terms causing the imbalance of the rights and obligations between the contract parties are unfair and therefore invalid (the § 53 (5) of the Slovak Civil Code). A term of a contract could be reviewed to be unfair under these presumptions:

- there is a consumer contract, so that a consumer is one of the contract parties;
- the potential unfair terms have not been individually negotiated; it means the consumer were not able to influence this terms in the contract;
- the terms are related to the main object of the contract and the adequacy of the price unless they have been negotiated clearly, comprehensible and certainly.

There is not necessary the existence of the cross-border element for the application of the Council Directive 93/13/EEC. It means that the rules of Directive are applicable in each consumer contract regardless the place of doing business or citizenship of the contract parties.

According to the article 6 (1) of the Council Directive 93/13/EEC, the member states *shall lay down that unfair terms used in a contract concluded with a consumer by a seller or supplier shall, as provided for under their national law, not be binding on the consumer and that the contract shall continue to bind the parties upon those terms if it is capable of continuing in existence without the unfair term*. The § 53 (3) of the Slovak Civil Code declares that these unfair terms will be invalid but it is not clear stipulated if the invalidation is void or voidable. The jurisprudence is not united in this issue. "(...) the rules which cause the imbalance in the rights and obligations not in favour of a consumer are unacceptable and therefore voidable within the meaning of the § 40a of the Civil code."[5] On the contrary, Vojčík et al. (2008) consider these rules are void: "According to the § 53(5), the unacceptable terms in the consumer contracts are void."[6]

The second opinion is more probable. Firstly, the § 40a of the Civil Code includes the numerous clauses reasons of the voidable legal actions and there is no reason related to the unfair terms of the consumer contracts. Secondly, according to the European Union law, the member state shall lay down that unfair terms shall not be binding on the consumer. The Slovak republic as one of the EU member states will not be able to fulfill this duty if the unfair terms are only voidable. In the case of the voidable actions, the court may take into account the unfair terms only when the consumer shall it claim during three years since the concluding the contract. By the expiration of these three years after the concluding the consumer contract, the consumer would not be able to claim the unfair term successfully. Thirdly, the Court of Justice of the EU stated: "*The aim of Article 6 of the Directive, which requires Member States to lay down that unfair terms are not binding on the consumer, would not be achieved if the consumer were himself obliged to raise the unfair nature of such terms.*"[7] Thus, the national courts have a duty to take into account the unfair terms by virtue of office and this condition could not be fulfilled in the case of voidable legal action because in this case, a national court is limited by the claim of the claimant (consumer).

3 Unfair terms in the consumer contracts

According to the § 53 of the Slovak Civil Code, an unfair term is any term, which can cause an imbalance in the rights and obligations of the contract parties not in favour of the consumer; this term has not been negotiated individually and is not related to the main object of the contract or adequacy of the price, which is defined clearly, comprehensible and certainly. The main object and the price are usually the essential elements of a contract. Therefore these elements are considered as negotiated individually without burden of proof if they are defined clearly and comprehensible; otherwise the consumer protection could threaten the legal certainty and legitimate expectations of the contract parties. The Court of Justice of the EU enables to the member states to stipulate the stricter conditions for the consumer protection. According to its judgement Caja de Ahorros "*articles 4 (2) and 8 of Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts must be interpreted as not precluding national legislation, such as that at issue in the main proceedings, which authorises a judicial review as to the unfairness of contractual terms which relate to the definition of the main subject-matter of the contract or to the adequacy of the price and remuneration, on the one hand, as against the services or goods to be supplied in exchange, on the other hand, even in the case where those terms are drafted in plain, intelligible language*."[8]

The § 53 (4) of the Slovak Civil Code includes only the exemplificative enumeration of the potential unfair terms, which could be inserted into a consumer contract. The Council Directive 93/13/EEC names also only the examples of the potential unfair terms that could be present in the consumer contracts. Therefore it is necessary to judge an unfair tem in an individual case within all circumstances related to this case. The general conditions necessary to take into account in each individual case can be defined as follows:

- Does the term cause the imbalance in the rights and obligations not in favour of the consumer? If so, is it a consumer contract? If so, has a term been negotiated individually? Was the consumer able to change this term in the contract? Or is it a form contract? If so, is this term related to the main object of the contract or the adequate price? If so, are they clear, comprehensible and certainly?
- to review the character of the goods and services which are the main object of the contract;
- to review good faith where the regard shall be had to the strength of the bargaining positions of the parties, whether the consumer had an inducement to agree to the term and whether the goods or services were sold or supplied to the special order of the consumer. The good faith as an element of the unfair terms were not implemented to the Slovak Civil Code, but it does not mean that it is not necessary to take it into account in an individual case. On the one hand, the European Union law should be applied

[4] Judgement of the Court of Justice of the EU dated 22.11.2001 in joined cases C-541/99 and C-542/99 Cape Snc v. Idelaservice Srl a Idealservice MN RE Sas v. OMAI Srl
[5] LAZAR, J. et al. Občianske právo hmotné. 1. Bratislava: Iura edition, 2010. p. 53
[6] VOJČÍK, P. et al. Občiansky zákonník. Stručný komentár. Bratislava: Iura edition, 2008. s. 181
[7] Judgement of the Court of Justice of the EU dated 20.6.2000 in joined cases C-240/98 to C-244/98 Oceano Grupo Editorial SA and Rocio Murciano Quintero
[8] Judgement of the Court of Justice of the EU dated 3.6.2010 in case C-484/08 Caja de Ahorros y Monte de Piedad de Madrid

prior the national law; on the other hand each member states took the duty to implement the EU law correct by the EU accession, otherwise it is a serious breaking of the EU law;
- to review all circumstances related to the concluding of the contract;
- to review all terms of this contract or the other contracts that are closely connected with this consumer contract, which the potential unfair term can be dependent from.

The exemplificative enumeration of the potential unfair terms and the general conditions that should be taken into account in an individual case result in the fact, that any term in the contract cannot be considered as unfair per se. For example, a poor term in a consumer contract that any potential dispute between the parties will settle in the arbitration, cannot be considered as unfair per se but only after the consideration of all above mentioned conditions.

The Court of Justice of the EU asks the national courts to take into account these conditions by virtue of office "*the nature and importance of the public interest underlying the protection which Directive confers on consumers justify, moreover, the national court being required to assess of its own motion whether a contractual term is unfair, compensating in this way for the imbalance which exists between the consumer and the seller or supplier*."[9] The new judgments of the Court of Justice of the EU change this obligation of the national courts to consider the unfair character of a term by virtue of office. It is not necessary to consider it while a consumer insists on the application of this terms regardless the potential unfair character: "*The national court is required to examine, of its own motion, the unfairness of a contractual term where it has available to it the legal and factual elements necessary for that task. Where it considers such a term to be unfair, it must not apply it, except if the consumer opposes that non-application.*"[10] These judgments of the Court of Justice of the EU result in the fact that the burden of decisions on the unfair character of a term in a consumer contract lays down on the national courts. The Court of Justice of the EU distributes the role of the national and supranational courts as follows: "*Article 267 TFEU must be interpreted as meaning that the jurisdiction of the Court of Justice of the EU extends to the interpretation of the concept of unfair term used in Article 3(1) of Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts and in the annex thereto, and to the criteria which national court may or must apply when examining a contractual term in the light of the provisions of that Directive, bearing in mind that it is for that court to determine, in the light of those criteria, whether a particular contractual term is actually unfair in the circumstances of the case*."[11] If the unfair character of a term were given per se by Council Directive 93/13/EEC, the Court of Justice of the EU would be able to enunciate it unfair character directly. However, there is necessary to consider also the legal and material elements, the national courts have the burden of decision on the unfair character of a term.

The conclusion of this part results in the fact that the unfair character of a term in a consumer contract should be judged according to the legal and material elements of an individual case by the national courts by virtue of office. If a term is considered as unfair, the national court has not to apply it unless the consumer as a contract party opposes that non-application.

3.1 Arbitration clause in the consumer contract

The annex of the Council Directive 93/13/EEC includes terms that can be considered as unfair. One of them (under the point q) is related to the arbitration; the term can be considered as unfair if *excluding or hindering the consumer´s right to take legal action or exercise any other legal remedy, particularly by requiring the consumer to take disputes exclusively to arbitration not covered by legal provisions, unduly restricting the evidence available to him or imposing on him a burden of proof which, according to the applicable law, should lie with another party to the contract.* The main aim of this rule is to avoid a risk that the stronger party of a consumer contract inserts the arbitration as exclusively way of the dispute settlement regardless of the consumer´s willingness. This term is usually one the terms stipulated in the general commercial conditions or one of the terms in the form contracts that consumers cannot change. If a consumer signs this contract, he/she gives up the possibility to file a claim at a national general court but he/she usually does not know these consequences of the arbitration clause. Therefore the EU law maker inserted such arbitration term to the potential unfair terms in the annex of this Council Directive.

The arbitration clause is unfair only potentially as well as any other terms named by the Directive. However, it is necessary to find out the legal and material elements of a case, to review the character of the term, if it was negotiated individually and the fact if the consumer opposes the non-application of this term. According to the article 3 (2) of the Council Directive 93/13/ECC *a term shall always be regarded as not individually negotiated where it has been drafted in advance and the consumer has therefore not been able to influence the substance of the term, particularly in the context of a pre-formulated standard contract.* The absence of the individually negotiated arbitration clause does not mean the unfair character of this term per se because the other elements of an individual case should be considered.

According to the § 54 (4r) of the Slovak Civil Code, an arbitration clause is considered as unfair if the consumer is obliged to settle a dispute with the other contract party exclusively at the arbitration court. By other words, the unfair terms are the terms which avoid to the consumer to file a claim at a national general court; it means if a consumer files a claim at the national general court (not at the arbitration court according to the arbitration clause), the national court has a duty to consider a potential unfair character of this arbitration clause by virtue of office. If the court considers this term unfair, it will not apply this term; it means the court decides the case regardless the arbitration clause. This interpretation is supported also by the diction of the above mentioned annex of the Council Directive. The consumer has a right when acting for his/her rights protection at the court that this court should consider the unfair character of the arbitration clause negotiated in favor of the other contract party by virtue of office. And if the clause is unfair, the court should not decide on the lack of its jurisdiction due to arbitration clause and decides the case.

However, the present status of legal regulation and the judgments of the Court of Justice of the EU result in the fact that national courts cannot consider the arbitration clause unfair always and in each case regardless the willingness of the consumer. It is not excluded that a consumer will have just an interest to settle a dispute at the arbitration court. If a national court decides on each arbitration clause between a consumer and other contract party that it is an unfair term and therefore a non-applicable term, this practice could lead to the similar extreme as the forced arbitration clause. The consumer will lose the possibility to choose an arbitration clause voluntarily. This practice is hardly in harmony with the aim of the Council Directive 93/13/EEC as well.

3.2 Arbitration clause from the view of the Court of Justice of the EU and the Slovak law

The Court of Justice of the EU has had more occasions to interpret the unfair character of arbitration clauses. The Court of Justice of the EU has never declared the unfair character of an individual term in a consumer contract but defined clear that it is the role of national courts because there is necessary to consider moreover the legal and material elements of an individual case.

[9] Judgement of the Court of Justice of the EU dated 26.10.2006 in case C-168/05 Elisa Maria Mostaza Claro v. Centro Móvil Milenium SL
[10] Judgement of the Court of Justice of the EU dated 4.6.2009 in case C-243/08 Pannon GSM Zrt. v. Ersébet Sustikné Györfi
[11] Judgement of the Court of Justice of the EU dated9.11.2010 in case C-137/08 VB Pénzügyi Lízing Zrt. v. Ferenc Schneider

It is not a role of the Court of Justice of the EU in the preliminary ruling proceeding according to the 267 TFEU.

The Court of Justice of the EU stipulated that the national courts in the execution proceeding (hereinafter only as execution courts) have a duty to consider an unfair character of the terms in the consumer contracts by virtue of office. In the case Asturcom the Court of Justice of the EU explored "*whether the need to replace the formal balance which the contract establishes between the rights and obligations of the parties with an effective balance which re-establishes equality between them requires the court or tribunal responsible for enforcement to ensure that the consumer is afforded absolute protection, even where the consumer has not brought any legal proceedings in order to assert his rights and notwithstanding the fact that the domestic rules of procedure apply the principle of res iudicata.*"[12] On the one hand, the Court of Justice of the EU goes out the general legal principles valid also in the international public law and the national legal orders and respects the general principle of res iudicata which considers as an important principle for the maintenance of stability in the law and legal relations regardless the non-application of this principle enables to retrieve breaking of the EU law (e.g. case Kapferer C-234/04; Köbler C-224/01). On the other hand, the Court of Justice of the EU considers the character and meaning of the public interest, which is the starting point of the Council Directive 93/13/EEC: "*Accordingly, in view of the nature and importance of the public interest underlying the protection which Directive 93/13 confers on consumers, article 6 of this Directive must be regarded as a provision of equal standing to national rules which rank, within the domestic legal system, as rules of public policy*."[13] Within these opinions and application of the effectiveness and equivalence principles the Court of Justice of the EU came to the interpretation of the Council Directive "*a national court or tribunal hearing an action for enforcement of an arbitration award which has become final and was made in the absence of the consumer is required, where it has available to it the legal and factual elements necessary for that task, to assess of its own motion whether an arbitration clause in a contract concluded between a seller or supplier and a consumer is unfair, in so far as, under national rules of procedure, it can carry out such an assessment in similar actions of a domestic nature. If that is the case, it is for that court or tribunal to establish all the consequences thereby arising under national law, in order to ensure that the consumer is not bound by that clause*."[14] The key words of this judgement consist in the range of the national law which enables to the execution courts to consider a potential unfair character of an arbitration clause. By other words, an execution court is entitled to review the unfair character of an arbitration clause only in so far as, it can review the legal and material elements of a case according to the similar legal rules of the national law.

According to the Slovak law, a power of an execution court is limited by the § 44 of the Execution Order (law no. 233/1995 Coll.) and the § 45 of law no. 244/2002 Coll. on arbitration proceeding.

The § 44 (2) of the Slovak Execution Order stipulates: "*If the court find out a disharmony between the claim or other documents brought by an executor on the one hand and the law on the other hand, the court refuses this claim*." This rule should be interpreted restrictive; the execution court cannot review the harmony of the material elements of an execution title (decision) issued by a court, an administrative body or an arbitrator. There is more reason for that. The execution title (decision) should be binding also on the execution court as well as the other courts, administrative bodies regardless its disharmony with the law because the Slovak legal order has enough other legal instruments (e.g. appeal) to ensure its harmony with the law. Furthermore, the superior court cannot review the judgment of the inferior courts over the scope of the appeal. If the superior courts are limited to review the execution title by the appeal, the execution courts cannot have much broader power to review all material and legal elements, especially when these execution courts do not have any legal instrument to ensure a remedy.

Within the § 45 of law no. 244/2002 Coll. an execution court has a power to review by virtue of office if an arbitration award lays down a duty to fulfil something what is impossible (general material impossibility to fulfill the arbitration award), forbidden by law (general legal impossibility to fulfill the arbitration award because the award fulfillment will result in a civil or administrative tort or a criminal offence) or contrary to good manners (the fulfillment of arbitration award would not mean a commitment of a tort or criminal offence, but it would be against morality in a society). The Slovak law maker does not want to give a power to the execution courts to review all material elements of arbitration awards. According to this legal diction and the above mentioned judgments of the Court of Justice of the EU, the execution courts are enabled to review the arbitration award only in the range of object that should be fulfilled by a party (mainly consumer); for instance they may not review the arbitration clause because of lack of the material and legal elements of a case, but they can review e.g. an unfair character of default interest rate if it is possible to assess this fact direct from the arbitration award. The § 45 of law no. 244/2002 Coll. gives more power to the execution courts than the § 44 of the Execution Order. The reason can consist in the fact that the law does not ask to be an arbitrator only a person with the legal profession, it can result in the arbitration award laying down a duty to the consumer which is impossible or forbidden by law or contrary to good manners. The law maker gives to the execution courts adequate legal instruments to ensure retrieval, e.g. they can stop the execution proceeding or they can refuse to certificate an executor to realize an execution. But it does not mean that the law maker wants to give a power to the execution courts to be higher instance of the arbitration tribunals. The Supreme Court of the Czech Republic stated that "*the intent of the law making body was to exclude judicial survey of material elements of an arbitration award in the meaning of rightness of the material and legal elements; if should a court carry out to review its material rightness within the proceeding of abolishment of the arbitration award, the legal regulation of the arbitration proceeding will stay without any practical meaning*."[15] The second argument against the extensive interpretation of the § 45 of the law no. 244/2002 Coll. is lack of legal instruments for remedy given to the execution courts. If the law maker wanted to give a power to review also the material elements of arbitration awards, he would give to the execution courts also the adequate legal instruments to realize remedy. The power to stop an execution proceeding or to refuse to certificate an executor to the execution does not lead to any remedy of the material incorrectness of the arbitration award. The only result is to avoid to the beneficiary (other party of the consumer contract) to enforce a right justified to him in the arbitration award by any legal instrument. The stopping of an execution (the second phase of the civil proceeding) of the arbitration award establishes res iudicata for the new execution proceeding and the beneficiary cannot file a claim at the national general court (the first phase of the civil proceeding) because of res iudicata created by the arbitration award, which was not abolished by an execution court because of lack of a power to do it.

The present practice of the Slovak execution courts when refusing to certificate an executor for execution or stopping the execution proceeding because of a pure arbitration clause in a consumer contract creates an unacceptable obstacle for enforcement the justified rights of the beneficiaries. The justified rights cannot be enforced by any other national legal instruments. The beneficiaries have only the possibility to ask for fair trial at the Constitution Court of the Slovak Republic or at the Court for human rights in Strasbourg.

[12] Judgement of the Court of Justice of the EU dated 6.10.2009 in case C-40/08 Asturcom Telecomunicaciones SL v. Cristine Rodríguez Nogueira, point 34
[13] Judgement of the Court of Justice of the EU dated 6.10.2009 in case C-40/08 Asturcom Telecomunicaciones SL v. Cristine Rodríguez Nogueira, point 52
[14] Judgement of the Court of Justice of the EU dated 6.10.2009 in case C-40/08 Asturcom Telecomunicaciones SL v. Cristine Rodríguez Nogueira
[15] Judgment of the Supreme Court of the Czech Republic dated 30.10.2009, no. 33 Cdo 2675/2007

4 The legal and economic impacts of the Slovak execution courts practices

The Slovak execution courts stop the execution proceedings or refuse to certificate an executor to the execution because of arbitration clause in the consumer contracts regardless other material and legal elements of an individual case and willingness of a consumer about the way of dispute settlement. These practices of the Slovak execution courts can cause many legal and economic problems.

The legal problems can be summarized as follows. Firstly, the role of all national courts (including execution ones) is to decide independently and fairly without prejudice to one or another party of the dispute. However, this practice breaks this basic role of justice because the execution courts defend only the rights of a consumer regardless another contract party. They do not care if an arbitration award is also in favor of other contract party or anyway. Practically, the courts become a legal representative of consumers. Secondly, the arbitration proceeding between a consumer and another contract party will not be used and the contract parties will have to settle their disputes only at the national general courts. It would result in higher hard-pressure on the courts and the court proceeding will run longer. By the way, the long-term civil proceedings are the main problem of fair trail even now. Thirdly, this practice should have a negative effect also on the consumers who should be protected. The execution courts do not care on the willingness of a consumer how want to settle the dispute. It could be just a consumer who wants to settle a dispute in the arbitration. The execution courts force the consumers to settle the dispute only at the national general courts what is the same extreme like a forced arbitration clause in a consumer contract.

The economic problems are close joined on the legal ones. Firstly, there can be a negative impact of the state budget. The state is responsible for the human rights; if violated, the state has a duty to compensate its violation. The compensation is usually given in money from the state budget. It is more dangerous in the present economic crisis and the efforts of member states to press down the state debt and the debt of public finance. Secondly, the practice of the execution courts will bring many businessmen up to bankruptcy due to insolvency. It will result to the higher rate of unemployment and loss of capital and investment on the Slovak markets. It will cause the decrease of the living standard what is direct contrary to the objectives of the Council Directive 93/13/EEC and judgment of the Court of Justice of the EU which stated "*moreover, as the aim of the Directive is to strengthen consumer protection, it constitutes, according to Article 3(1) EC, a measure which is essential to the accomplishment of the tasks entrusted to the Community and, in particular, to raising the standard of living and the quality of life in its territory*."[16] Thirdly, it could be a brake for the development of the business activities in Slovakia, because not only the tax policy but also the law enforcement is one of the important factors for doing business as well.

Conclusions

The Slovak execution courts avoid the beneficiary enforcing the fulfillment justified in the arbitration award when stopping the execution or refusing to certificate an executor to the execution because of the pure arbitration clause in a consumer contract. The beneficiaries lose the possibility to enforce the justified rights by any legal way. The interpretation of the § 44 (2) of the Slovak Execution Order and the § 45 of the law on the arbitration proceeding should be realized within the principle of the indirect effect introduced by the Court of Justice of the EU. According to this principle the national law should be interpreted in harmony with the EU law, but the interpretation must not be *contra legem*. Neither the Council Directive 93/13/ECC either the judgments of the Court of Justice of the EU stipulate that any arbitration clause is per se unfair. The Slovak execution courts interpret incorrect not only the rules of this Directive but also the national legal rules (§ 44 (2) of the Slovak Execution Order and § 45 of the law on the arbitration proceeding). The Slovak law maker did not want to give a power to the execution courts to review all material and legal elements of the final decided cases. The role of execution courts is limited to review the fulfillment justified by the arbitration award only from the view of a potential general material or legal impossibility or a potential collision with the good manners. However, any broader power to review the arbitration awards by the Slovak execution courts can lead to the break of the human right for fair trial guaranteed by the article 6 of Convention for the Protection of Human Rights and Fundamental Freedoms.

[16] Judgement of the Court of Justice of the EU dated 26.10.2006 in case C-165/08 Elisa Maria Mostaza Claro v. Centro Móvil Milenium SL, point 37

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VIEW OF TEACHERS AND STUDENTS ON ACTIVATING TEACHING METHODS

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Abstract: New requirements for secondary school graduates call for a new approach to the teaching process. Not only the content and goals of teaching, but also the methods of acquiring knowledge are changing. The traditional way of giving knowledge to students is supplemented by modern, activating teaching methods, which support activity, creativity and skills development of students, help them to enter the real business. The use of teaching methods depends on various factors, which influence teachers in making their own selection. Each method has its positives and negatives. Therefore is it important that the teacher uses multiple teaching methods and combines them together in order to make the result of teaching as effective as possible. In this contribution we analyse the opinions of teachers and students, we have obtained on the basis of survey about using different teaching methods in selected schools.

Key words*:* teaching methods, classical teaching methods, activating teaching methods

1. THE CORE AND THE MEANING OF ACTIVATING TEACHING METHODS

Social evolution brings new knowledge and information, which become very quickly out-of-date. The necessity of their systematic gathering and acquiring puts greater demands on all of us and the success of this process depends, besides other things, on how people are ready to work with new information and to use it in real life. The basic of this preparation is provided by school education.

In the context of extensive changes in society, globalization and technology development, the requirements for knowledge of graduates are being changed. The educational process does not only represent acquiring new knowledge and skills by the students, but places on them extra requirements, for example: to be able to communicate, to argue, to be able to use information and work with them, to solve problems, to be able to present themselves as well as the results of their teamwork. An important tool that allows the graduates to discover, to motivate, to learn to work in a team, leading to a creative personality and enhancing their readiness for the world of work, is the use of appropriate teaching methods in teaching process.

Modern understanding of teaching method is based on a new perspective on teaching process that reflects the changes in the society. Teaching method must be comprehended in a wider context, not only as a coherent technique or way helping the teacher to meet objectives. It represents a dynamic component that changes relatively fast and adapts to new aims and conditions. It is associated with other elements of the learning process, which interact to each other and form together a unified teaching system. The most important relations are:

- Relationship between teaching method and its objective – this is an active relation. The intended objective corresponds with the adequate teaching method, but also the method depends on what goals we want to achieve.
- Relationship between teaching method and the learning content – this is a very dynamic connection, as well. It is based on the fact that through this teaching method is the subject (teacher, student) connected with the teaching objective. The role of the teacher is to provide students with a learning content using teaching method, so they will be able to master it.
- Relationship between teaching method, teacher and student – teacher's teaching and student's learning, are two interconnected parts of the same goal-directed activity, that are giving a special character to the teaching methods. When selecting a teaching method, the relationship between teacher and student, also called pedagogical interaction, plays an important role. The teacher's participation in selection, orientation and implementation of methods is higher than the participation of students, but on the other hand, only by their close mutual cooperation can teaching lead to a success.
- Relationship between teaching method and didactic principles – for example: the principle of activity that prefers activating teaching methods, the principle of consistency and sequence, which requires the system to respect the system of science, does not disturb the scientific and logical organization of subject matter, the principle of linking theory with real use, while the methods used to ensure those principles are attractive because of their activating function, they bring release, simultaneously revive teaching and others.
- Relationship between teaching method and organizational forms of teaching – the relation is so close that it is sometimes made no distinction between them, what is not correct from a logical point of view. For example lesson (as the basic organizational form of teaching) is a wider organizational unit, while teaching methods are only its components.
- Relationship between teaching methods and education level – when choosing teaching method, it is necessary to respect the physiological, psychological and social characteristics of students, their level of knowledge, experience, skills, ability to concentrate and other factors. The result is that for primary, secondary school or higher education, are used different teaching methods.

Every teaching method has its own characteristics that contribute to the organization of educational process and also to the level of acquired knowledge. Most often two groups of teaching methods are compared: the so called classical (traditional) teaching methods and activating (modern) teaching methods. Critics of the classical teaching point at its imperfection, in particular that:

- Teacher is more active than students, he provides them with information and organizes their work,
- Activity of students is restricted, as they do what they are instructed to do and how to do it according to the teacher,
- In teaching dominates verbal learning methods (teacher explains, students master their curriculum mainly by mechanical repetition),
- The individuality of students are less respected,
- The most common source of information for students is teacher and textbook,
- It provides a small opportunity of mutual cooperation for students.

New view at the position of student in teaching represents a turn in pedagogical thinking that led to the creation of activating teaching methods. These methods are involved in the elimination of stereotypes in the educational process and they contribute to a creative approach of teachers and students. The importance of activity during the teaching lies in the fact, that it develops students' skills, their independence, initiative and creativity. To be able to talk about activating teaching, it is necessary to apply such methodological approaches, which enable students to acquire new knowledge, develop skills and certain mental functions, such as activity, independence, thinking, creativity, social skills, such as empathy, ability to work together to express themselves and listen to others and so on.

People often ask why it is important to carry out teaching in an active way. The answer is simple. The best students learn by practice. If the student is responsible to learn something well and remember it, it will help him if he hears, sees, asks for things that he does not understand, discusses this issue with others and in the main is engaged in any kind of business or activity. One of the options how to carry out activating teaching is to bring activating teaching methods into it. These methods are based on social learning theory. We can say that active learning is learning:

- participative, where the student does not receive information passively but creatively and proactively participates in the learning process,
- cooperative, which takes place in interaction and collaboration with other participants of the learning process,
- experiential, based on experiences and practice and characterized by direct contact with matters, people and nature,
- creative,comes out from divergent thinking, requiring a combination of rational and intuitive thinking and creative problem solving.

In this way, students acquire knowledge not only in more interesting form, but also in a form that ensures the durability of their knowledge, develops logical thinking and the students are able to incorporate new knowledge into the system of already acquired knowledge and so to create their own system. Particular effects activating teaching methods are reflected positively in various areas such as:

- static monologue methods are changed to dynamic form, which will increase students' interest in discussed issue, understand it better through applied knowledge and experience;
- application of higher train of thought processes is required from students, for example: evaluation, problem solving, analysis, synthesis, creative thinking,
- students perceive learning as an activity carried out by themselves,
- level of internal motivation increases positively,
- cognitive processes are being developed (perception, imagination, memory and thinking),
- social aspects of student's personality are being developed (e.g. empathy, accept other people's opinions),
- communication and presentation skills of students are being developed, ability to argue and defend their opinions,
- relationship between teachers and students is being changed, students have more room for self-fulfilment and development of their individuality,
- it is a work style where students participate in what is happening in the group,
- their positive approach increases when they examine the new, acquire new habits in the process of learning and work style.

Despite innovative character and positives, activating teaching methods have their limits. Their implementation may occur in individual subjects as negative, as well. One could think of teacher for example a lack of experience, unwillingness and disinterest of new methods of psychological barriers, difficulty of preparation, difficulties in the assessment and others.

Students may express refusal to work under the new methods, reluctance to actively participate and express themselves in a team, attempt to take advantage of others in their favour, etc. Even the school management may present a lack of interest in innovation, because it can cause problems with material, technical and organizational learning, teachers may request to divide the class into smaller groups, thereby increasing their working time and school needs more money for their wages and so on.

2. RESULTS OF A SURVEY ON USE OF TEACHING TECHNIQUES

Every teaching method has its positive and negative aspects. When it comes to their usage personality of the teacher plays a crucial role. He should be able to choose the best from the classic and activating teaching methods, find the correct way of their interconnection, so the result of their use will be as efficient as possible. The selection should apply various criteria, in particular:

- regularities of the teaching process (e.g. logical, psychological, educational),
- teaching goals and tasks,
- content, which mediates the subject,
- level of physical and mental development of students, their readiness to handle the requirements,
- peculiarities of a class, a group of students,
- external conditions for working, for example technical equipment of the school,
- teacher's personality, his professional and methodical level, experiences etc.

The problem of optimal selection of teaching methods is essential for the effectiveness of the educational process, because the teaching method is that tool that mediates and ensures acquirement of educational goals. Both the choice of methods, as well as its implementation is a complex process that often requires several changes in comparison with the usual style of teaching. Therefore it is important that teachers master the complex theoretical basis and issues associated with teaching methods. They should be familiar with various teaching methods, learn how to properly choose the learning method with regard to educational objectives and required students' competencies, to know their strengths and weaknesses, principles of use and so on.

Within the pedagogical observation we were interested in how teachers in secondary schools are willing to use activating teaching methods, how they apply teaching methods that motivate students to work independently, to think in a logical and critical way and how they encourage creativity. For this purpose, we carried out a survey in selected secondary schools. By the help of questionnaire method we tried to find out the opinions and attitudes of teachers and students on this issue. The survey sample consisted of 100 teachers and 225 students. In the survey, we focused on the following courses of study:

- what role has the goal of teaching when choosing the teaching methods,
- the proportion of classical and activating teaching methods used in teaching,
- how teachers are prepared to use modern teaching methods.

In considering the relationship of teaching methods and teaching goal we assumed that the most important role in decision about the method to use has the chosen goal. Our expectation was not fulfilled. Only 26% of teachers stated goal as a crucial factor. When analysing the results, we concluded that even if the teacher always sets the goal, he may not formulate it directly. Thus many of them do not regard it as a separate factor when choosing teaching methods. Up to 60% of teachers considered teaching content to be a crucial factor. When deciding on teaching method they intend to use, most of them are affected in their decision by the amount of curriculum for a lesson. Most of them (65%) see the large amounts topics in curriculum as a problem and that is why they choose less time consuming teaching methods (classical teaching methods). Other teachers, who consider teaching content to be crucial, are influenced by the character and structure of curriculum when selecting teaching method (20%) or by the processing technique of the curriculum in textbooks (15%). Another factor that decides on used teaching method is the teacher's own teaching style (14%).

Investigating the proportion of classical and activating teaching methods, we assumed that the proportion of classical teaching methods will be higher. Our assumption was confirmed by the fact that 65% of teachers stated that they use only classical teaching methods. Some stated that they use them evenly (25%) and only 10% of them put emphasis on modern, activating teaching methods that develop students' thinking and creativity. Teachers mentioned several teaching methods in order of their importance. In classical teaching method leads the explanation method, which 83% of teachers do regularly use and the conversation method which is used regularly by 80% of teachers. Despite the fact that conversation relates to the interview, this learning method is used regularly only by 22% of teachers, 8% use it on average, 38% sometimes and 32% did not state it at all as one of the used methods. The low proportion of its use is considered as a negative phenomenon, because the conversation is in the majority of problem tasks an essential method, which uses according to teachers' answers up to 55% of teachers

regularly and 23% of teachers on average.15% of teachers do not use this method at all. From activating teaching methods, the problem tasks are used particularly in connection with brainstorming, didactic games and staging methods. Less used are situational teaching methods, project methods, various modifications of brainstorming and motivational teaching methods.

In the survey, we focused on students, as well. We tried to find out what teaching methods are preferred by them. Up to 58% students stated activating method, 10% classical methods, 25% both methods and 7% of the students could not decide on this question.

When determining the level of knowledge and skills in using modern teaching methods, we concluded that 58% of teachers perceived deficiencies in the didactic course of study, especially in teaching methods. This was especially related to teachers over age 40 (75%). It appeared that many teachers are not familiar with the essence of modern, activating teaching methods. This is also one of the reasons why they focus on traditional proven teaching methods. This problem can be solved by a variety of training courses and seminars focused on teaching methods that can provide teachers not only with theoretical information on the specifics of these methods, but also with practise to their practical implementation to teaching.

In conclusion we can observe that each teaching method is reasonable one. As we mentioned, it has its advantages and disadvantages. Therefore, it depends mainly on the teacher to be able to decide which of them is in particular situation the best and which brings the best results. When choosing the method, there is no general rule. This makes it even harder to decide, but in the case of a positive result is the success more valuable because it proves that we were able to combine several elements of teaching correctly. Only through mutual cooperation can they bring the expected results.

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Primary Paper Section: A

Secondary Paper Section: AM

USING OF INFORMATIVE AND COMMUNICATIVE TECHNOLOGIES IN MUSIC EDUCATION

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Abstract: Contribution processing and analyzing possibilities of using informative and communicative technologies in teaching music. It also indicates the importance of implementing informative and communicative technologies (ICT) to the process of teaching in light of current tendencies and trends in teaching music and educational subjects. It provides answers to the question if ICT really motivates students to be more active in music lessons. We notice if there is a bigger difference in student's motivation to musical activities for students teached with classic educational approaches than in new approaches with using means of ICT in education.

Keywords: informative and communicative technologies (ICT), music education, motivation.

1 THEORETICAL BACKGROUNDS OF THE RESEARCH PROBLEM

One of the education problems today is the low level of the student's motivation to learn. Motivation to learn is by Vagnerova internal mental state, which stimulates the activity to achieve good performance and its application, and keeps it for some time. The motif can be seen as the reason for student learning, but also to show what he learned. If the child is motivated to learn, does not operate at its capacity. It is important to know what are the students thinking about school and learning, what it means for them.(Vágnerová, M., 2001).
Motivation is one of the fundamental dimensions of personality. Motivating pupils to learn affects many factors. One is the necessity for new initiatives, curiosity.

Morozov sees removing the problems in student's motivation to learn just wit using ICT. But he also sees the existing problems,which are related to their use in teaching. One of the main causes of wrong using the ICT in education is a surfeit of the curriculum with plenty of information on web resources, even in existing training programs on CD-ROMs. It emphasizes the proper presentation of electronic teaching materials, which is engaging in activities for students. This means that it must be activity, that student wants to perform without external incentives, just for himself, it means activity invoking the student activity internal motivation for learning, enjoyment. In English exists the term "learning is fun." (Morozov, 2005).

Kučerová and Pálušová consider motivation as one of the characteristics of ICT. Using these technologies, according to them more often motivates students to acquire new knowledge, because these technologies are closer to them and also closer from everyday life and they are interested in them. Motivation through ICT leads to increase efficiency of teaching.(Kučerová, A. - Pálušová, M., 2006).

Čelinák speaks about motivational function of informative and communicative technologies. Text, graphics, audio and animation information mediated by ICT according to him strongly influenced by their authenticity and documentation to the recipient (student), to raise his keen interest, curiosity, satisfaction and will to learn. (Čelinák, 2006).

1.1 Objectives and hypotheses of the research

In our research we wanted to examine the effectivity of the education with using ICT in music education and measure the gained knowledge through didactic tests. We were interested in student's motivation to study on lessons of music education supported by resources of the informative and communicative technologies.

As basic research objectives we have set:

• map the attitude of students to teaching music education,
• determine with using the questionnaire method, as students perceive teaching music education supported by resources of the informative and communicative technologies,
• determine by the experiment method, how the using of ICT in education affects themotivation of students to teaching music education and their rating the music activities compare to a group of students, which educated with the traditional way of teaching,
• map, which musical activities supported by the ICT are students interested in the most.

From the objectives follows the hypotheses:

Hypothesis *interest*

H1 We assume that students, whose are taught by using the ICT, will consider music education more attractive (more interesting) than students whose music education go on by traditional form.

Hypothesis willingness *to participate in music education*
H2 We believe that students under the influence of ICT will be more interested in active participating in learning than students taught by traditional form.

Hypothesis *the evaluation of musical activities*
H3 We assume that students in taught by using the ICT will evaluate music activities supported by ICT better than students, whose musical activities will be supported by traditional didactic means.

Hypothesis *sex*
H4 We believe that teaching music education supported by ICT resources will be more interesting for boys than for girls.
H5 Under the influence of the using the ICT in education will boys be more active in teaching than girls.

1.2 The research sample

Research that was conducted in ictober 2008 and 2009 in Elementary school with kindergarten Horná Kráľová was conducted with two groups of students. Both samples weren't selected randomly, for realize of our research we chose a school and environment that we knew well and we knew how to orientate in the material schol equipments, particularly in the cabinet collection of music education and didactic techniques. Both groups were represented by a group of students from the 5th, 6th, 7th, 8th and 9th class. Since we could not ensure the participation of all students in all measurements, the number of students who filled out a questionnaire, is not consistent with the planned sample of the research. The number of students who participated in research, we presented in the following table. Regarding the composition of the groups, weren't found statistically significant differences in the composition of the groups, which would include the variables sex and class.

Table 1 basic stats of the experiment

Control group			Experiment group		
Class	Measurement	Number of students	Class	Measurement	Number of students
5. class	1.measurement	16	5. class	1.measurement	14
	2.measurement	12		2.measurement	11
6. class	1.measurement	14	6. class	1.measurement	19
	2.measurement	13		2.measurement	18
7. class	1.measurement	17	7. class	1.measurement	19
	2.measurement	17		2.measurement	13

8. class	1.measurement	19	8. class	1.measurement	15
	2.measurement	18		2.measurement	13
9. class	1.measurement	14	9. class	1.measurement	24
	2.measurement	13		2.measurement	20

1.3 Methodical prosedure

In our research we used pedagogical experiment to verify the hypothesis. Research was conducted with two groups of students. With experimental group, where the teching process on music lessons happened took a place in a computerlab with using ICT and with a control group, where the educational process follows the classical method. Both groups represented a group of students from the 5th, 6th, 7th, 8th and 9th class. Later on we used the questionnaire method to verify our hypotheses, which we seemed the most appropriate way of obtaining data about the attitudes of students to teaching music. This method seemed to us appropriate in view of the statistical processing methods, which we decided to prioritize.

Research was conducted in the following phases:

1. The course of instruction of the experimental group was conducted in a computerlab, where was music education supported by ICT for ten lessons. Educatio n in the control group took place in the classic way and were taught the same topics as in the experimental group, and when it the traditional didactic resources allowed with the same actions.
2. After the implementation of a block of taught lessons in one and the second group, we verified the hypothesis by questionnaire, which students from control and from experimental groups filled out after each taught hour.
3. We analyzed the collected data by χ^2 test.

1.4 Theoretical background construction of the questionnaire

We designed the questionnaire understandable for pupils. We did not use terminology of the musical activities, because we assumed that students will likely understand the term "singing" than "vocalwork" (in the analysis of the results we are using the terminology).

The questionnaire included the questions, of which we tried to determine if a student thought the taught lesson interesting, if was the music activities interesting for him, if he joined them. In the open question number 7, the students should indicate which activity was the most interesting for them. The scale questions number 8 and 9, we tried to find out the attitude of the students to different music activities conducted in music lessons. Question number 9 completed only experimental group of students and we found out which ICT supported music activities in the classroom was most impressed.

In the control group, we received 153 completed questionnaires and in the experimental group 166 questionnaires.

1.5 Methodology of creation of the lessons with using Microsoft PowerPoint programme

To create a lessons of music education in computerized form, we decided to use Microsoft PowerPoint programme. This program allows to create effective and dynamic presentations. It is part of MS Office software package and allows to share information easily with others.

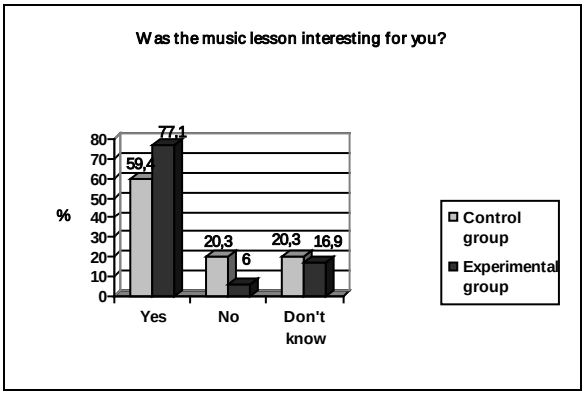
In terms of motivational aspect we came out in creation of presentations from the key requirements, which should have the educational environment in relation to the learners (Bonk, Dennen, 2004). We also tried to create presentations asi t supports the students creativity and led to an activity and to live students music-making activity.

1.6 Statistical verification of the hypotheses

Testing the hypothesis was conducted on the results of the calculations of χ^2 test of homogeneity with which we investigated the significance of differences between the research variables.

Hypothesis *the interest*
We wondered if students are under the influence of learning supported by information and communication technologies, consider an hour of music education as more interesting. In that hypothesis, we assumed that "pupils, teaching involving the use of ICT, will be teaching music education more attractive than students whose music lessons runs with classical method." Hypothesis H1 is confirmed by us.

In the experimental group considered the music lesson as interesting 77.1% of students, in the control group only 59.4% of students. The results of the χ^2 test indicates a high statistical significance. The value of $\chi^2 = 16.66$, $p < 0.001$.



Graph 1 Student's attitude to taught hours of music lessons

Interesting is that in the experimental group we approached mainly boys (see Table 2), of whose 72% considered music education with the use of ICT as interesting, in the control group considered music education as interesting for only 50% of boys. This difference is highly statistically significant at the significance level $\alpha = 0.001$ ($\chi^2 = 15.92$, $p < 0.001$).

Table 2 Boys attitude to taught lesson

Boys		**Control group**		**Experimental group**	
		AS	RS	AS	RS
Was the music lesson interesting for you?	**Yes**	45	50,0	67	72,0
	No	25	27,8	6	6,5
	Don't know	20	22,2	20	21,5
Total		90	100,0	93	100,0

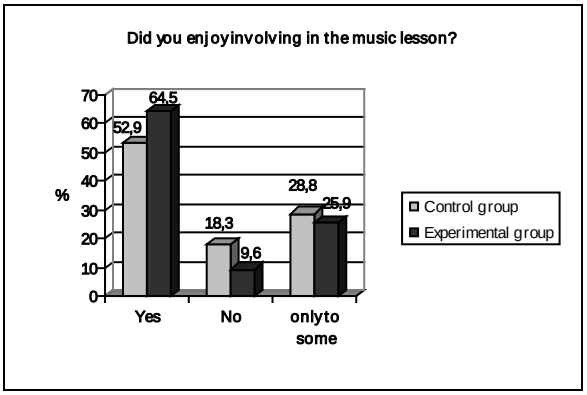
Hypothesis willingness *to participate in music education*

As we already mentioned above, many teachers consider means of ICT as very attractive. Even their presence in the classroom can pacify also classes, which sometimes behave problematic. It can not be overlooked the fact, that students sense the technology like a toy - they played with and had fun in their lives outside school and the positive emotions associated with the use of the play was apparently transferred to a situation when are ICT used specifically for teachers.

Based on these informations, we developed the hypothesis H2, which stated: "We believe that students under the influence of ICT will be more interested to active participating in learning than students taught by traditional form."

To question if students enjoy participating in activities on music lessons, responded positively in the experimental group 64.5% of students, which is about 12% more than in the control group (52.9%). The result of the χ^2 test indicates statistical significance at level $\alpha = 0.05$. The value of $\chi^2 = 6.36$, $p < 0.05$. Hypothesis number 2, we confirmed.

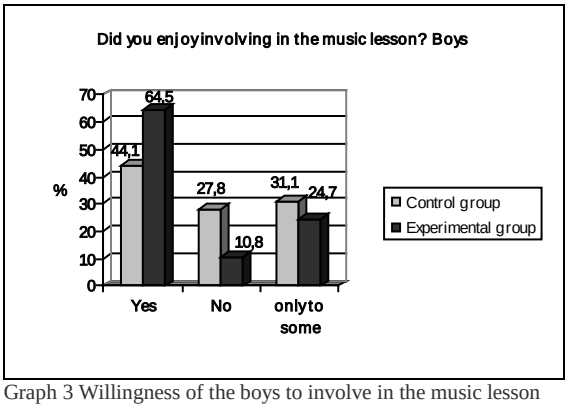
Music education didn't enjoy in the control group up to 18.3% of students, in the experimental group only 9.6% of the students, what is almost a half students less. Only to some activities involved roughly the same number of students in the experimental and control groups.



Graph 2 Willingness to involve in the music lesson education

Striking difference is in involving in the music education for boys, which involved in the control group only 41.1% of boys, in the experimental group up to 64.5%, what is difference up to 23%. Evidently, this high boy's interest for education supported by means of ICT is related to a natural interest in technology for boys. The value of $\chi^2 = 12.33$, $p < 0.01$, means very strong statistical significance on the level of statistical significance 0.01 .

To education in the control group enjoyed involving up to 27.8% of boys, in the ICT-supported learning didn't enjoy only 10.8% of boys, which we believe is quite a big difference.



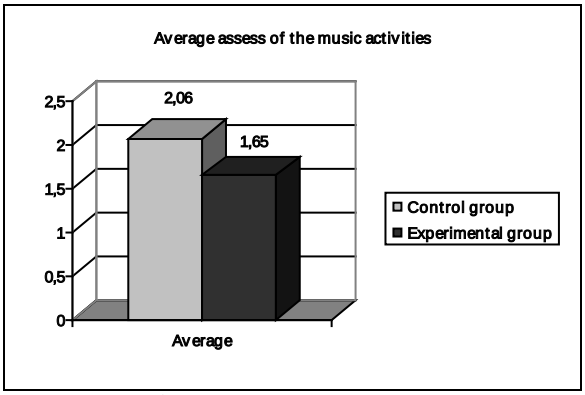
Graph 3 Willingness of the boys to involve in the music lesson education

Hypothesis *the evaluation of musical activities*

In our research we also wanted to determine, if the using of ICT in music education has an influence also for assess individual music activities by students. The third hypothesis was:

" We assume that students in taught by using the ICT will evaluate music activities supported by ICT better than students, whose musical activities will be supported by traditional didactic means by ICT." Determined hypothesis H3, we confirmed.

The total average of student's rating of the musical activities, in the control group was 2.06, which was worse than the value 0.41 in the experimental group. The value of $\chi^2 = 22.31$, $p < 0.001$,which means that the difference in assessment in the music activities by students of experimental and control groups is statistically significant. We confirmed the hypothesis number 3.

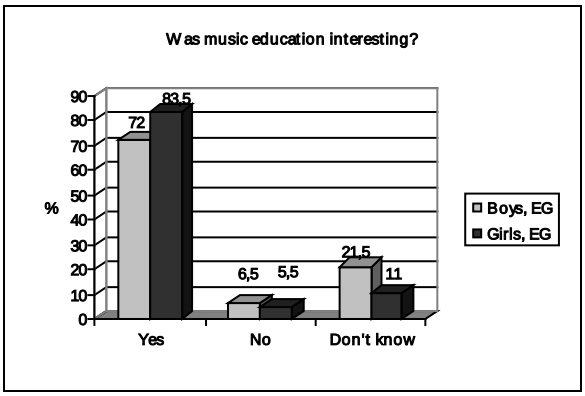


Graph 4 Assess of the music activities.

Hypothesis sex

In our research we assume that boys and girls will the using of ICT in music education perceived differently ,this means that their use of ICT in music education will influenced differently.We were based on the assumption that boys have a closer attitude to ICT than girls. Accordingly, we made two hypotheses, where H4 was: " We believe that teaching music education supported by ICT resources will be more interesting for boys than for girls." Hypothesis H4, we didn't confirme.

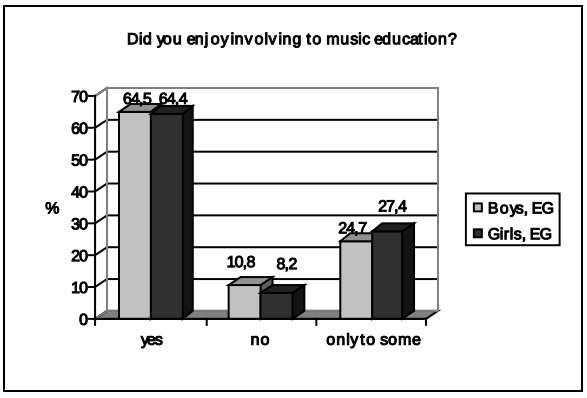
In the experimental group considered interesting music education higher percentage of girls (83.5%) than boys (72%). The result of the χ^2 test ($\chi^2 = 3.46$, $p > 0.05$) attests to the statistical insignificance. This implies that girls and boys considered music education supported by ICT as evenly interesting.



Graph 5 Student's attitude to taught music lessons

We assumed that the relation to technology and ICT will also affect the willingness of the boys to engage in music education. Based on this assumption, we set the hypothesis H5, which stated: " Under the influence of the using the ICT in education will boys be more active in teaching than girls." The hypothesis H5, we didn't confirme.

The graph 6 shows that the willingness to engage in music education supported by ICT are the minimum differences between boys and girls. Also the result of the χ^2 test ($\chi^2 = 0.39$, $p > 0.05$) indicates statistical insignificance, it means that girls and boys joined to music education supported by ICT in same like.



Graph 6 Willingness to involve by the experimental group's students.

1.7 Discussion

Statistical processing of data arising from the evaluation questionnaires, have come to the conclusions of our research when answering the research problem was: "They see students supported by teaching resources for ICT interesting? ICT resources motivate students to be more active during school hours as a classical music education teaching resources? "

Our teaching music education supported by ICT, we managed to take a higher percentage of students like Cox (1997), we keep more attention to students compared with traditional hours. In accordance with the opinion and Jereba Šmiteka (2006), we can say that unfortunately, the metal was supported by ICT-hour waste of time and bored, the only ones who have identified a dreary hour (6%) and was not involved in the teaching of love (9%). We have achieved better results than in the control group, but it was kind of "first" attempt to use ICT in the teaching of HV and hope for the further use of ICT in teaching music výcovy acquire more experience and we have before us and take part in teaching even higher percentage of students.

In general, felt that ICT is perceived positively in boys than girls. They show that such research Broosa (2005) and Volman (Volman et al., 2005). Our research, however, no difference in attitude to the hour of music education supported by ICT and a willingness to engage in a lesson supported by ICT between boys and girls not recorded.

Compared with classical teaching hours, we managed to musical activities supported by ICT means to reach a statistically significant higher percentage of boys. The difference in the control and experimental group of girls was not statistically significant.Thus, it appears that the use of ICT in teaching music education is the way that he can reach out and take a particular male, is the traditional teaching of music education and a big problem using ICT, we can wipe away the differences in willingness to engage in teaching music education between boys and girls .

CONCLUSION

Music Education is faced with many problems, which new concept of music education try to remove. The music content is more attractive, new textbooks were made. Music education must not become complacent and must continuously seek new ways of teaching.

One of the mean, how to increase student's school success and student's motivation for learning also the music education, is by us using the ICT in teaching. The object of our work is to verify our opinion by presented research. By using these technologies are respecting the principles of music and educational work. Informative and communicative technologies help students understand the connection between objects and musical disciplines or music activities, about what is the principle of integration, and help them to solve the various problem situations, while they respect the principle of creativity. The principle of attraction by which the teacher is always looking for new methods and forms,from that students enjoyed the music lesson, almost forcing teachers to resort the informative and communicative technologies.

Realization of the integration of the ICT into teaching not only music education in traditional general education schools but complain incurred traditional approaches, which stands in the center of teachers served ready knowledge of their subsequent verification by reproduction. Strong are also the trends of the inertia of thinking, stereotype in the minds of teachers and students, a widespread perception, that only in immediate contact teacher – student, it can be effective in learning, using of the ICT is a kind of self-education.

We hope that our work will just a little bit help to remove these trends and shows the teachers the possibilities of music education with using informative and communicative technologies in music education.

We shouldn't forget in introduction of ICT in music lesson, that at first we have to take into character of the subject. We should project a music lesson with using ICT to support student's creativity and led them also to a live music-making activity.

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Primary Paper Section: A

Secondary Paper Section: AM, IN

PROTECTION OF EU CITIZEN ACCORDING TO ART. 23 TFEU: DIPLOMATIC PROTECTION AS DEFINED BY INTERNATIONAL LAW?

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Abstract: This paper analyses Art. 23 of the Treaty on the Functioning of the European Union, which establishes the right of an unrepresented EU citizen to protection by the diplomatic or consular authorities of any EU Member State in the territory of a third country. Particular attention is paid to well-established concepts of public international law, namely the diplomatic protection and consular assistance. Customary rules of international law governing these two concepts are briefly interpreted within the context of international law and, subsequently, they are confronted with relevant provisions of the Treaty on Functioning of the European Union with the aim to exclude the possibility of equating the regime introduced by Art. 23 with the concept of diplomatic protectio.

Keywords: Diplomatic Protection, Consular Assistance, Treaty on Functioning of the European Union.

1 Introduction

According to Art. 23 of the Treaty on Functioning of the European Union (to be referred to as "TFEU"), "every citizen of the Union shall, in the territory of a third country in which the Member State of which he is a national is not represented, be entitled to protection by the diplomatic or consular authorities of any Member State, on the same conditions as the nationals of that State"[1]. Such subsidiary and extraordinary protection is often referred to as diplomatic and consular protection of EU citizens or (diplomatic and/or consular) protection of unrepresented EU citizens in third countries. But does the concept articulated by Art. 23 TFEU adhere to diplomatic protection as defined by international law? Or would it be rather correct to speak about consular assistance? Is the European approach still acting within the framework of customary legal rules, which reflect well-established inter-state practice in global context, or can we witness newly emerging concept of interstate relations in different quality? These are the crucial questions that have to be answered in this article.

2 International Law Focus on Diplomatic Protection

2.1 Diplomatic Protection as Defined by International Law

First of all, a comprehensive definition of diplomatic protection has to be provided in order to decide whether the "right" enacted by Art. 23 TFEU belongs to this concept. In this way, the Draft Articles on Diplomatic Protection adopted by the International Law Commission in 2006 are very useful and instructive. Upon Commission's analysis of relevant state practice, it has been formulated a definition of diplomatic protection by virtue of enumeration of its elements which have to be fulfilled cumulatively. In this sense, "diplomatic protection consists of the invocation by a State, through diplomatic action or other means of peaceful settlement, of the responsibility of another State for an injury caused by an internationally wrongful act of that State to a natural or legal person that is a national of the former State with a view to the implementation of such responsibility"[2]. Thus, if a State intends to exercise diplomatic protection in favour of an injured person, it is necessary to meet three basic requirements[3]:
1. responsibility of a State under international law for injury to an alien caused by State's wrongful act or omission,[4]
2. a tie between the person injured and the State exercising such protection (so called "nationality of claim"),[5]
3. exhaustion of all local remedies.[6]

Upon meeting all of these preconditions, a State of national injured may politically intervene in favour of such person. This intervention may take various forms of diplomatic and other actions provided that these actions meet the criteria for "peaceful means of dispute settlement".[7]

The possible argument in favour of political intervention in a form of indirect protection of individual's rights and interests by the intervening State may be found in Art. 3(1)(b) of Vienna Convention on Diplomatic Relations, which provides that one of the functions of diplomatic mission in receiving State is a protection of interests of nationals of sending States within the limits permitted by international law. In accordance with Art. 2 of this Convention, the diplomatic relations between States (and consequently also their permanent diplomatic missions) are established by mutual consent of these Parties. Thus, the combination of consensual establishment of diplomatic relations (having primarily political nature, in contrast with consular relations of predominantly non-political, administrative nature[8]), implied consensus of States on protecting its nationals under jurisdiction of other States in accordance with afore-mentioned Art. 3 and reference to purposes and principles of the Charter of the United Nations[9] creates a basic treaty framework for possible exercise of diplomatic protection.

It is worth noting that the exercise of diplomatic protection is a discretionary right of the State[10] of nationality of injured person and this person is neither entitled to such protection, nor belongs (theoretically) to beneficiaries of this protection. However, the Draft Articles on Diplomatic Protection in its Art. 19 recommend the protecting States a practice of giving due consideration to the possibility of exercising diplomatic protection (especially) in cases of occurrence of significant injury, taking into account the views of injured persons with regard to resort to diplomatic protection and the reparation to be sought, and transferring any compensation obtained from the responsible State to the injured person.[11]

2.2 Diplomatic Protection, Consular Assistance - Overlapping Concepts?

Diplomatic protection and consular assistance are terms which are often used in a way that confuses both of these concepts. This is caused mainly due to the fact that the rules governing both concepts are mainly customary in their nature (and, thus, relatively unclear in some aspects of mutual delimitation of diplomatic protection and consular assistance) and that the subjects involved in this assistance or protection are rarely differentiated as to what kind of functions are they actually performing in certain situation.[12] It may be argued that the wording of Art. 23 TFEU expresses consular assistance as it

[1] Art. 23 of the Treaty on the Functioning of the European Union.
[2] Art. 1 of the Draft Articles on Diplomatic Protection.
[3] These are implied or expressly included in the ILC's definition of diplomatic protection.
[4] AMERASINGHE, C. F.: *Diplomatic Protection.* Oxford: Oxford University Press, 2008, p. 25.
[5] This tie (link) has to be of certain quality. International law regards for sufficiently strong link solely the nationality link. However, some efforts in progressive development of international law are emerging. In details, see Art. 3 to 8 of the Draft Articles on Diplomatic Protection.
[6] According to conditions and limitations laid down by Art. 14 of the Draft Articles on Diplomatic Protection.
[7] To the discussion about possible governmental actions that may be used by the exercise of diplomatic protection, see KÜNZLI, A.: Exercising Diplomatic Protection: The Fine Line Between Litigation, Demarches and Consular Assistance. In *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht (Heidelberg Journal of International Law)* [online]. 2006, vol. 66 [cit. 2012-01-29], pp. 323 - 331; and DUGARD, J.: *Seventh report on diplomatic protection (A/CN.4/567)* [online]. ILC, 2006 [cit. 2012-01-30], pp. 6 - 7.
[8] MRÁZ, S., POREDOŠ, F., VRŠANSKÝ, P.: *Medzinárodné verejné právo.* Bratislava: VO PF UK, 2003, p. 94.
[9] See the Preamble of the Vienna Convention on Diplomatic Relations.
[10] AMERASINGHE, C. F.: *Diplomatic Protection.* Oxford: Oxford University Press, 2008, pp. 79 - 90.
[11] Art. 19 of the Draft Articles on Diplomatic Protection.
[12] For example, Art. 70 of Vienna Convention on Consular Relations permits the diplomatic mission to exercise consular functions. This provision contributes to uncertainty in delimitation between diplomatic protection and consular assistance as diplomatic bodies may exercise not only diplomatic functions (political in their nature) but they are also entitled to operate as a consular body (vice versa does this principle not apply , i.e. the scope of activities of consular bodies is strictly limited to exercise of consular functions).

states the right to "protection by the diplomatic or consular authorities", thus covering the wide range of consular activities exercised by consulates and consular departments of diplomatic missions. On the other hand, diplomatic protection is not limited solely to the actions of diplomatic authorities and, what has to be highlighted, consular authorities should be excluded from the possibility of exercise of diplomatic protection due to their non-political status determining its non-interventional operation in mutual inter-state relations.

So what does the consular assistance stand for? This concept may be described as a form of assistance to the nationals presumed by international law, which is provided by the State of national in distress. In a broader sense, the consular assistance includes activities like facilitation of processing of administrative and judicial matters of nationals abroad, visas issuance or collective actions for citizens who find themselves in various emergency situations.[13]

As such casuistic definition could not render the difference between diplomatic protection and consular assistance, it is useful to compare these two concepts with respect to their characteristic features. In previous Chapter (see Chapter 2.1), basic requirements for exercise of diplomatic protection were identified. Above all, if the threshold laid down by these requirements is not reached, it is not possible to speak about diplomatic protection at all.

Moreover, Künzli argues that there are three substantial distinctions between diplomatic protection and consular assistance: greater legal limitations of consular activities comparing to diplomatic protection; different level of representation; and the legal nature of both concepts. Firstly, the possible scope of consular assistance is limited by the principle of non-intervention, whereas there is no such constraint on exercise of diplomatic protection.[14] Secondly, in a case of diplomatic protection, it is required to represent the interest of a State rather than just the interest of an individual (which is typical for consular assistance). Finally, "consular assistance often has a preventive nature and takes place before local remedies have been exhausted or before a violation of international law has occurred"[15], whereas the diplomatic protection might be described as "remedial protection".[16]

Vigni adds two more differences between the two concepts in question with respect to the time and place in which they occur. Thus, consular assistance consists of providing support for a national abroad (so called *in situ* protection, i.e. assistance provided in the host State where the beneficiary of such assistance is physically located) either *ex ante* (before an injury to the citizen occurs) or *ex post* (in case of injury already suffered or in danger occurred). On the other hand, diplomatic protection does not require the presence of the injured individual in the territory of the wrongdoing State at the time of complaint of the State of nationality (diplomatic protection can be, thus, described as *ex situ* and *ex post* protection).[17]

Theoretically, a relatively clear line dividing diplomatic protection from consular assistance could be drawn. In practice, however, the line between these two concepts is much more unclear, in many situations rather confusing.[18]

3 European Context

As it has already been outlined, the legal order of the European Union grants a special right to its citizens to ask for protection the consular or diplomatic authorities of other EU Member States if they occur in a situation where their State of nationality lacks its own consular or diplomatic representation in the territory of a third country. This provision raises many question of whether it deals rather with diplomatic protection, consular assistance or a *sui generis* regime created for satisfying the specific needs of this community of States, potentially built up on a series of agreements with third countries as one of its characteristic feature.[19] Now, we will briefly analyze the status of the provision of Art. 23 TFEU as to find out whether it meets the legal requirements prescribed by law to be considered for diplomatic protection.

3.1 "Nationality of Claim" Interpretation in EU Context

First of all, the "nationality of claim" as one of the most controversial precondition should be examined. According to Art. 20 TFEU, EU citizenship is construed as an additional concept to national citizenship with no ambition to replace it. Thus, every person holding the nationality of any EU Member State is simultaneously an EU citizen. But does the EU citizenship reach the quality of EU Member State's nationality?

In practice, the terms nationality and citizenship are used interchangeably as synonyms. From the theoretical point of view, these notions have slightly different meaning. As Künzli points out, "since nationality is a necessary requirement for EU citizenship one could also conclude that nationality has a higher status than citizenship"[20]. For nationality, in contrast to citizenship, the requirement of "ties of belonging and a sense of identity to the 'nation'"[21] seems to be crucial, together with the fact that "the term ‘citizenship’ is confined mostly to domestic legal forums, while the term ‘nationality’ is connected to the international law forum"[22]. Such assumption argues in favour of domestic dimension of EU citizenship with little relevance from the international law point of view.

Though the European bodies argue that the concept of EU citizenship (through the provision of Art. 23 TFEU) is enriched by a specific external dimension, which is intended to strengthen the idea of European solidarity and the identity of the Union in third countries[23], the quality of the link between an EU citizen and EU bodies (and to even less extent to other EU Member States) does not reach the quality of the bond between the national and his State of nationality. The provision of the Draft Articles on Diplomatic Protection (reflecting customary legal rules of international law) grants the right to exercise diplomatic protection solely to the State of nationality of injured person.[24] This cannot be fulfilled if a person is linked to the protecting EU Member State only through internationally unrecognised EU

[13] KŘEPELKA, F.: Stručně o podpůrné konzulární ochraně občanů Evropské unie. In *Dny práva - 2010 - Days of Law* [CD-ROM]. Brno: Masaryk University, 2010, p. 2558.
[14] Thus, if a State provides the consular assistance in favour of a non-national, it is usually accepted and relatively rarely disputed due to its non-interventional nature.
[15] KÜNZLI, A.: Exercising Diplomatic Protection: The Fine Line Between Litigation, Demarches and Consular Assistance. In *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht (Heidelberg Journal of International Law)* [online]. 2006, vol. 66 [cit. 2012-01-29], p. 336.
[16] Ibid., pp. 331 - 337.
[17] VIGNI, P.: Diplomatic and Consular Protection in EU Law: Misleading Combination or Creative Solution? In *EUI LAW Working Paper*, 2010, No. 11, pp. 25-26.
[18] This aspect supports some scholars in finding some "transitive" forms of protection in situations, which does not meet the requirements for diplomatic protection but, at the same time, are of different nature comparing to consular assistance. Čepelka and Šturma, for example, write about "diplomatic representation" as a protection in form of assistance, intervention or protest done *in situ* by diplomatic or consular authorities (or other relevant bodies) abroad in favour of their national in a case, when the bodies of the other State treat these nationals contrary to the expected treatment in accordance with domestic law or *comitas gentium*. For more details, see ČEPELKA, Č., ŠTURMA, P.: *Mezinárodní právo veřejné.* Praha: C. H. Beck, 2008, p. 345.
[19] This is anticipated by Art. 23 TFEU, which in its second sentence states: "Member States shall adopt the necessary provisions and start the international negotiations required to secure this protection."
[20] KÜNZLI, A.: Exercising Diplomatic Protection: The Fine Line Between Litigation, Demarches and Consular Assistance. In *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht (Heidelberg Journal of International Law)* [online]. 2006, vol. 66 [cit. 2012-01-29], p. 344.
[21] Ibid., p. 345-346.
[22] RUBINSTEIN, K., ADLER, D.: International Citizenship: The Future of Nationality in a Globalized World. In *Indiana Journal of Global Legal Studies*, 2000, vol. 7, no. 2 p. 521.
[23] *Consular protection for EU citizens in third countries: State of play and way forward (COM(2011) 149 final)* [online]. European Commission, 2011 [cit. 2012-01-30], p. 2.
[24] See Art. 3(1) of the Draft Articles on Diplomatic Protection. The provision of Art. 3(2) of the Draft Articles, however, enables the exercise of diplomatic protection by a State in favour of stateless persons or refugees with qualitatively different link between these persons and the protecting State. In fact, this provision does not reflect current interstate practice and it may be considered for a progressive development of international law (as a potential rule *de lege ferenda*). In details, see PAVLOVIČ, P.: Diplomatická ochrana osôb bez štátneho občianstva a utečencov: Progresívny rozvoj medzinárodného práva ako brzda kodifikačného úsilia? In *COFOLA 2011 : The Conference Proceedings* [CD-ROM]. Brno: Masarykova univerzita, 2011, pp. 640 - 648.

citizenship (as the subject exercising diplomatic protection is not the Union, which is linked to the citizen in need at least by the bond of this citizenship, but solely an EU Member State as a different subject of international law with no relevant link to such person), thus making any claim presented in this way easily objectionable by third States.

In response to this conclusion, Moraru argues that the Draft Articles on Diplomatic Protection "establish minimum standards under public international law which permit the States to go beyond these rules as long as they respect the condition of obtaining the express and unanimous consent of all the States involved in the new model (i.e. the State of nationality, the State exercising the protection and the receiving third country)"[25]. In our opinion, the presented conclusion does not reflect the political reality and interests of various actors in their mutual relations. As there is usually missing substantial general consent on the merit of disputes setting up the exercise of diplomatic protection, it is hardly conceivable that the "defendant State" will expressly accept the claim of the "injured State" by defending its rights through diplomatic protection. Moreover, this trilateral consent is quite usual for providing consular assistance[26], without any evidence of such practice in case of diplomatic protection.

The European form of protection of unrepresented EU citizens in the territory of third States by diplomatic and consular authorities is also characterized by individual nature of this right. This feature is determined by express wording of Art. 20(2) TFEU stating that "citizens of the Union shall enjoy the rights and be subjects to the duties provided for in the Treaties". This provision is accompanied by exemplification introducing explicitly the right specified in Art. 23 TFEU. What is more, in favour of this argumentation speaks Art. 46 of the Charter of Fundamental Rights of the European Union, which enshrines (among other rights of individual nature granted to EU citizens) the right with the same wording as expressed in Art. 23 TFEU. Textual and contextual interpretation of Art. 20 TFEU and Art. 46 of the Charter allows us to argue in favour of individual nature of the right of protection of unrepresented EU citizens abroad. Since diplomatic protection is a discretionary right of the protecting State (which protects its own interests when "injured" by mistreating its national by third State), European solution cannot be interpreted in this way. Individual nature of EU citizen's right to protection provided by diplomatic or consular authorities of other EU Member States, thus, does not correspond with the substantial feature of diplomatic protection.

3.2 Specifications of Art. 23 TFEU in Other EU Documents

Art. 23 TFEU (together with afore-mentioned Art. 46 of the Charter of Fundamental Rights) cannot be regarded for single provision of EU law governing the content of this specific right stemming from EU citizenship. Except of this "constitutional" level, there are several documents and reports of various working groups on this topic specifying some aspects of general provision of Art. 23 TFEU.

The Decision 95/553/EC, for example, specifies that the protection provided by Art. 23 TFEU shall compromise following actions: assistance in cases of death, assistance in cases of serious accidents or serious illness, assistance in cases of arrest or detention, assistance to victims of violent crimes and the relief and repatriation of distressed EU citizens.[27] This list is not exhaustive; a citizen may also apply for protection in other circumstances, in which immediate assistance should be given to a national in difficulties.[28] Enumerated spectrum of activities is typical agenda of consular authorities, especially if we consider the fact that in such situations does not usually occur violation of international law, requested assistance is provided *in situ* (as later, *ex situ*, the citizen is no more in need) and there are usually any local remedies at disposal at all. If we match these findings with general part of this article, which defines diplomatic protection in the framework of international law and deals with the most visible differences between this concept and consular assistance, there is every possibility to match the EU solution with specific form of consular protection.

Recently, a proposal for a Council Directive on Consular Protection for Citizens of the Union Abroad[29] has been presented. This document, objectively governing (*de lege ferenda*) the regime of practical application of the protective regime enshrined in Art. 23 TFEU, uses solely the term "consular assistance" when describing this concept. The shift from misleading or inaccurate term of "diplomatic and consular protection of EU citizens" to current usage of title "consular assistance" is quite obvious.

3 Conclusion

As presented in this article, we consider the right to protection of unrepresented EU citizens in third countries as stated in Art. 23 TFEU to be, in present state of legal regulation, a slightly specific form of consular assistance. At this time, the concept does not, and with respect to international law also cannot, fulfil the requirements to serve as diplomatic protection of EU citizens. However, the European integration is in permanent progress, so there is still a chance to deepen the integration to such extent that the EU citizenship will one day become comparable to the nationality of a federal state and diplomatic protection in terms of international law standards might become a real possibility for newly created European External Action Service. This hope is in part expressed in final report of CARE Project by following statement: "In light of the delicate foreign policy and diplomatic problems that the exercise of diplomatic protection entails, it is then understandable why the European Union, when developing the theme of European citizenship, placed emphasis on consular protection, leaving aside, at least for the moment, the development of diplomatic protection"[30].

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SPECIAL NEEDS INTERVENTION AND DRAMA EDUCATION IN RESEARCH

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Research project MSM0021622443 „Special Needs of Pupils in the Context of the Framework Educational Programme for Basic Education"

Abstract: Child alienation syndrome and the threatening processes of social informal learning are the basic phenomena that determine special education needs of children brought up in children´s homes. Within the inclusive context of special education, the special needs intervention of these children is led by the perspective of the quality of their adult life and aimed at their social competences strengthening. The outcomes from longitudinal research present the application and intervention efficiency with the use of drama education forms by an example of long-term research output.

Keywords: **r**esearch, behaviour disorder, child´s home care, drama, intervention.

1 INTRODUCTION

Inclusive transfers in perceiving the quality of life of a person changes also the pedagogical approaches to the subject matter of educating children with social disadvantages. The perspective for the quality of life as well as strengthening of social roles of these children is the basic concept of special education intervention in this group. One of the intervention trends of the concept is extending the opportunities in the socialisation processes of their lives. Special needs are found mainly in the children who live in children´s homes. They are caused by the *syndrome of the alienated child with the deprivation symptoms.* These are manifested by the emotion of permanent threat, social and emotional instability, and cognitive immaturity. Special education intervention requires balancing these deficits and transferring the life chances of these children to the level of the children living in families.

This article focuses upon the intervention of one group of children living in children´s homes. These are mainly children from families with low income that are failing to fulfil the needs of their children in their best interest and that threaten their development. The most frequent reasons for the children´s home placement by the court are depicted in Fig. 1. These reasons set a group of specific needs of children in children´s homes that are linked with *threatening processes of social informal learning*. These specific needs of children who are socially disadvantaged are viewed upon in this research. The research took place between 2008 and 2011.

1.1 Substantiation of the research

Children´s homes substitute the institutional space for the informal social learning, which the children transferred to children´s homes do not have in their natural communities. Concurrently, the space should also substitute the resilient environment in order to mediate within the said part of children´s population the sources for strengthening as well as support in the sense of their resistance to the negative influences from their social environment (Vojtová, 2010). When concluding the principles for intervention we based our findings upon the documents of WHO (2001). That is why we orientated the intervention upon the strengthening of the individual competences within the context of social relationships and procedural influences of education. We were taking into account not only the specificities of the educational needs of the target group but also the developmental dimension of childhood. We were emphasising the implementation of the interventional methods within the educational of an institution as well as the active involvement of all their children. We aimed the objectives upon the development of their social competences as well as coping strategies from the point of view of their quality of life in adulthood. The aim of our work was to create methods for coordinated specific prevention and timely intervention via drama in education within the context the perspective dimension of inclusive special education strategies.

1.2 The target group of the research

The target group of the research were children in the risk of developing a behavioural disorder as they already had disturbed development in the social sphere and sometimes even in their personal sphere, which is why the risk of developing a behavioural disorder in the group was high. According to the categorisation of WHO (2001) these children belong to the group of people without disorders, whose problems in functioning and behaviour are the direct consequence of their social environment. WHO sees the reason of their problems within the insufficient support, **discrimination** or stigmatisation. It is mainly in children where problems become the potential barriers for successful socialisation processes and education and thus they endanger the future of the child (Vojtová, 2010).

1.3 Methods and the course of the research

The main theoretical background of the research were the ***multi-factorial theory*** of the origin of behavioural disorders and ***the theory of resilience***, which link the concepts of the interventional strategies in children with behavioural disorders in the sense of increasing their resilience as well as their skill in managing problem situations.

On the individual level we worked upon the individual life scenarios of the individual children. The concept of the applied drama in education in the intervention with the resilient processes is aimed at strengthening the resilience of the group toward the risk factors. Such an approach opens the space towards extending their coping strategies. The need for the development results from the reality that majority of the children return to their families after the institutional care has finished, the families from which they were taken to the institutional care due to their dysfunction.

In this research we based the concept of the activities and situation for modifying the crisis life situation of the individual members of the target group as well as giving them the possibility to implement them into their individual life scenarios. The interventional potential of drama in education can be seen especially in the fact that it has impact on emotional, social as well as cognitive personal factors of children and it also uses their capacity of skills and experience regarding their active participation upon the change of their strategies of their behaviour. That is where the intervention becomes a dynamic process reacting to the topical situations, topics as well as needs, which are uncovered by its influence

2 INTERVENTIONAL STRATEGIES ON GENERAL LEVEL

The interventional strategy concept respects the principle of 3S influence– *strengthening, support, surveillance* defined by Věra Vojtová and Karel Červenka at the Conference of the perspective of work with the delinquent juveniles (2011). This concept regards as the basic factor of intervention the natural social environment and bonds. The condition for the conception of responsibility for changing their life situation as well as responsibility for deciding upon their behaviour in children is their active participation during the intervention. We prepared the concept for the conditions of children´s homes and we compensated the absence of the natural social environment (family) by transferring the topics into stories, i.e. into imaginary situations. We combined the children's´ experiences with non-functional (pathological relationships with positive emotional experiences and we did not forget to work with peer and sibling relationships in the group. The basic structure of the intervention was defined by four levels. **The first level** was special needs education assessment of behaviour and competences of the

individual children, which was recorded into a structured assessment of the subject matter. We based our findings upon a) analysis of the children´s documentation, b) observation in their natural social group. We used tools that we created for the assessment: a) *framework for the structured assessment*, and b) *the referential list of behavioural disorders***. The second level** was assessment of peer social interaction using record sheets. **The third level** was assessing the individual diagnostics and subsequent working out of the basic aims for the intervention for the individual children. **The fourth level** was the intervention.

2.1 The original situation in the group

The intervention was implemented by 4 students of the study programme of special education at the Faculty of Education of Masaryk University in Brno in the Czech Republic under our surveillance. The group with which they started working with originally counted 8 children between 10 and 18 years of age, 6 boys and 2 girls. During the work there were some changes in the composition of the group, some of the original members left it, other came, and finally the group consisted of 7 members, 6 boys and 1 girl. The children were mainly of Roma origin. The children lived in the children´s home between 5 and 8 years and 2 of them had some experience with taking addictive substances. Some of the children had contact with their families by the way of seldom visits at home, some were visited by their parents in the children´s home, and some did not have any contact with their families at all. There were two sibling groups among the children.

After the initial assessment of the children´s skills and competences, which took place individually we identified some ***specificities*** which appeared in all of them:

1. All the children were socially and emotionally unstable, which showed by their inadequate activities and reactions in social interactions. These projected into excessive initiation of physical contact with people who show some interest in them, even though they do not know them closer.

2. One part of the emotional picture of all the children within the group was excessive self-reference, quick and often changes in mood, low ability to express their emotions, inability to perceive the emotions of others, egocentrism. Most of the children also showed unreasonable and frequent changes in preferences to relate to the individual members of the group as well as the intervention team.

3. In the cognitive sphere all the children had problems with verbal communication. They were not able to express their ideas, emotions or wishes in words. At the beginning they could not even introduce themselves.

All the above stated facts will be illustrated upon two case studies, which concurrently substantiate the functionality of the intervention, which we executed in a children´s home for the period of two years. The names as well as the evidence are changed in accordance with the need for protecting the data of the observed child as well as with the ethics of the research.

3 INDIVIDUAL STUDIES

ROMANA

Special education diagnostics of behaviour and competences

R. appeared as a lively, merry, impulsive, headlong girl, who frequently reacted in a much unexpected way, she was trying to monopolise attention by various provocations, however, in the group she never culminated a situation into a significant conflict, and rather she withdrew. She had some experience with the junk and she frequently talked about running from the children´s home. When playing games she rather subdued to others. There was one girl in the group to whom she behaved with superiority and had the tendency to act with her in a manipulative way. As soon as the girl left the group and Romana became the only girl in the group she expressed her sorrow of losing her "friend" mainly in front of the members of the intervention team. She did not have problems with conversation even though she was not clever in it, she did not adhere to the chain of events, were not able to listen to others and react to the content of what was communicated. She was not capable of continuous utterance, she talked in individual words, could not express her experiences, not even say what was her mood on a specific day. The main topics of hers were the relationships with boys, fashion, music and sex; she jumped from one topic to another and frequently came back to the partner and sexual relationships. Even in personal communication with the intervention team members she transferred the conversation in this direction. She made social contacts with her peers without any difficulties, however, she was not able to keep them and frequently changed her interest in a concrete person, moreover, and she had the tendency to initiate a competing relationship between the persons she was interested in. She, herself, was jealous of other children when they were gaining attention of people who belonged to her momentary favourites. She behaved unskilfully in the social relationships also in further circumstances. She was not able to express her disagreement with other people´s opinions or behaviour, she frequently behaved in a confrontational and aggressive way (insults, accusing, crying) or she withdrew and refused to communicate. On the other hand, she was not blind to manipulation and did not let the others to manipulate her, if she did not want to behave in the way another person wanted, she was able to hold her opinion. She favoured some children in the group, nonetheless, she communicated with all the children. If it was needed she was able to help others, however, only to those she chose and under aimed support of the intervening people. She also provoked, laughed at and threatened chosen individuals. She laughed at others, for example, by imitating their behaviour. It was hard for her to concentrate as well as to understand instructions and rules of some games. She did not like expressing her emotions, if she did, it was inaccurate, on the other hand she was quick when commenting emotions of the others. She was not able to describe concrete situations, it was hard to her to describe her behaviour, she did not know how to evaluate things and phenomena. She expressed her worries of losing the goodwill of her peers, educators, intervening people. In the situations linked with her original home and life perspective she expressed anxiety. Even her nonverbal language showed uncertainty. Especially in connection with the others´ opinions of her she had the tendency to estimate the expected reaction and subdue her behaviour to it.

The main aims of the intervention

- In the social sphere we determined the basic aims of the intervention to be creating the skills and strengthening the following:
- actively enter interaction with peers with a concrete conscientious objective;
- actively enter interaction with adults with a concrete conscientious objective;
- react to contact as well as demand upon interaction in a corresponding way.
- In the emotional sphere we determined the basic aims of the intervention to be creating the skills and strengthening the following:
- evaluate one´s own emotions, differentiate them, express them;
- prevent aggressive manifestations;
- evaluate and differentiate emotions of others.
- In the cognitive sphere we determined the basic aims of the intervention to be creating the skills and strengthening the following:
- listen to others and adequately evaluate the obtained information;
- reflect upon one´s own behaviour in concrete situations, perceive the consequences of one´s behaviour;
- communicate about further topics, express one´s opinions, decide.

Reaction to the intervention

In the beginning she perceived drama activities as fun, games that she wanted to use to amuse herself, which led to her not paying attention to instructions, she frequently did not know what to do and seemed confused. This changed after some time, she started to concentrate, listen to instructions and later she actively cooperated. Even though we have to state that as soon as a problem, conflict, was to be solved, she did not want to cooperate, and if she did, she was solving it only surface-wise, directly, using verbal or physical aggression. She wanted to match with the boys. The point of break in her problem-solving was a story about a thief. Romana played the thief and she entered the spirit of the role in such a way that she managed to seized the whole group, which then managed to find several solutions, how to get from that situation. Since then she had entered the roles and had been trying to look for constructive solutions of a problem or conflict. She was most taken by the topics of friendship, family, and drugs. She was looking for a positive solution in the interventions, she was trying to decide with contemplating upon the consequences of her acting.

Romana made significant progress in developing her communication and cooperation. At the end of the intervention she was analysing her emotions, she could name them and explain.. In the beginning she refused to cooperate, only listened, she did not want to express her opinion to anything. After about a year of work she was able to express her opinion in front of everybody as well as defend it. Her position in the group improved and at the end of our work she became one of the leading personalities of the group, the other members respected her, asked her for her opinion, and cooperated with her. Nonetheless, there was not any significant improvement in the emotional sphere. She managed, to a certain point, to control her aggressive outbursts and, with the help of others, control her behaviour in the former "risk situations". However, the changes of moods outstayed in her, being influenced a lot by her personal life (her parents were moved out, the loss of belief in returning home). This echoed also in her involvement in the intervention, which resembled a seesaw. One day she was marvellous and cooperative, other day she was indifferent or cheeky. She tried to speak about her personal problems, however, when she managed to open a topic, she withdrew. Even the great effort of the intervening team did not manage to change the situation.

In the cognitive sphere we managed to improve Romana´s attention as well as strengthen her communicative competence. She succeeded in reflecting upon her behaviour and interpreting her emotions in concrete situations. She used her competences better in the controlled activities within the intervention. She was able to transfer them, according to the words of the educators, also into her life in the home; however, they were not incorporated enough yet to become a steady component of her behaviour.

The intervention was concluded after a year and a half before summer holiday. The plan was to continue after the holiday with the aim to strengthen the acquired competences in common stereotypes in her behaviour. However, Romana ran away from the children´s home during the holiday and was transferred into a children´s home with an onsite school. That is to say that the intervention ended due to external conditions. According to the above described outcomes we can conclude that drama education has interventional potential and its use brings positive changes for the competences of the target group.

MAREK

Special education diagnostics of behaviour and competences

Marek is the oldest member of the group and he has his siblings in it. He is unselfish, easygoing, likes having content people around him, which is why he tries to create pleasant atmosphere. He does not provoke others and it is not easy for other to provoke him; he tries to solve everything in a calm way. He is communicative; he is not afraid to talk about himself, though he does not say everything and has his secrets. Hi vocabulary is limited though. He is the informal leader or "father" of the whole group. Everybody listens to him, he is interested in everybody, gives advice, speaks to their souls and so on. He wants to look clever and adult, to be the best, though not at the expense of someone else. He gives space to the other children. He strengthens his leading role by using professional words from the fields of sociology and psychology, and even though, they often do not make sense, they have influence upon the children. However, for us it sometimes felt comical. Even though he is the leader of the whole group, he watches the interests and will of the other children. He does not like full interference into their lives, he would only like to support them in what he things is right and proper. Unfortunately, he is not capable of distinguishing these two dimensions of behaviour, which causes a problem as he takes what is good and proper uncritically from adults not thinking himself about it, without putting it into context, he cannot evaluate a situation, which is why the advice he gives is sometimes not adequate for the situation. We verified that during the diagnostics when we were able to observe his helplessness in our artificially created situations and his inability to consider possible alternatives for solving them. Nonetheless, we identified Marek´s ability to ask for support from the intervening person. Within the context of the wider special education intervention we found out that the above stated ability was not interiorised in such a way to make Marek able to use it in everyday social situations. That is to say we needed to anchor and train this ability in such an extent to make it for Marek his common competence in everyday life. That is why we were incorporating problem-solving, argumentation, opinion defending exercises, etc.

Marek is sometimes very sad but he is trying not to show it. He is a **boy, who had to mature ahead of time**. He was trying to deal with the situation in which he and his siblings found themselves adequately to his age. What we observed in Marek´s behaviour was increased tension which manifested itself in elevated strictness and being critical on one hand, and in protectiveness to their needs on the other. He seems to feel great responsibility for his siblings. His above described attitude together with the low perspective for successful solution of the family problem (the parents had been moved out of their flat) are assumed to be the source for his emotional unstableness and tendency to feel depressed. These did not show very much during the intervention, however, the educators stated that they belonged to Marek´s personal characteristics.

In the beginning he was very naive regarding his personal professional future. He thought that he would be able to study sociology of psychology at university even without A-levels as his results at the vocational school were good. After having read one psychological and one sociological book he admitted himself he did not understand them and refrained from that intention. His dream is to be able to work as a **social worker.** When we were talking with him about this advising what was needed for this profession, he said he did not need to study as he had it in himself, in his blood. His idea was that he would go to his Roma fellow citizens telling them the story of his life and his successes, telling them how important it is to work and not to steal, tell the truth, live in a clean flat. He also wants to help them solve various problems, etc. He believes that they will accept it from him, as he is like them, of the same origin.

The main aims of the intervention

- In the social sphere we determined the basic aims of the intervention to be creating the skills and strengthening the following:
- be able to observe other people´s behaviour and assess it – to differentiate the positive behaviour patterns from the negative;
- be able to evaluate problem situations, choose from the offered solutions, decide for solutions;
- strengthen the ability to find support, ask for support as well as provide support;
- anchor this ability in the competence of common situations in the children´s home, at school– cooperation with the educators and teachers;

- be able to say no in interaction.
- In the emotional sphere we determined the basic aims of the intervention to be creating the skills and strengthening the following:
- evaluate one´s own emotions, differentiate them, express them;
- evaluate and differentiate emotions of others.
- In the cognitive sphere we determined the basic aims of the intervention to be creating the skills and strengthening the following:
- listen to others and adequately evaluate the obtained information, react to critique with arguments, evaluate different opinions;
- view one´s own behaviour, needs, reflect upon one´s reactions to stimuli in concrete situations, perceive the consequences of one´s acting;
- enlarge one´s vocabulary, understanding words´ meanings, expressing one´s opinions and decision making;
- create an idea upon the strategies for fulfilling the perspective of one´s life.

Course of the intervention

Marek actively participated in the intervention. Our interest as well as the understanding of the importance and successes of his person was a significant factor for it. Concurrently, he was showing us that the interventional activities were too simple for him. He looked down upon the games as he felt too mature for them (he liked the games but he did not want to act as a child). In etudes working on social roles Marek, by his involvement, enthused other children to activity as they admired him, they joined in with him and were solving the problems contained in the etudes with enthusiasm; which was the role that suited Marek the most.

As quickly as at the beginning of our cohabitation we determined the rules for it. Marek kept all the rules we determined together and watched that the others kept them as well. He felt more and more responsible for his siblings and he often prioritised. Sometimes he acted as a kind of a moralist of the group. Unfortunately, he learnt to accept opinions from adults uncritically and he behaved as a puppet who is led by someone and who only repeats the heard words. It took a long time for him to learn to evaluate a situation and solve it. Even at the end of the intervention he had the tendency to ask for help in problem-solving, but it was rather rare.

During the intervention Marek made progress in his personal development, he acquired the ability to look upon his behaviour, evaluate and verbally describe his emotions. He learnt to say no when he needed to study or when he did not agree with something.

In the cognitive sphere Marek, as confirmed also by the educators, managed to develop problem-solving competence, deciding in various situations, as well as looking at the situations critically. Marek stopped expecting help which would come from somebody else, but started actively solving problems on his own.

Currently, Marek attends a secondary vocational school. He has excellent marks, is often praised, competes on behalf of the children´s home in table-tennis, likes playing football (was nominated the sportsperson of the year.) and painting (he had an exhibition of his pictures).

The academic year of 2010/2011 is Marek´s last year in the children´s home. He is 19, he asked for an extension of his stay there due to finishing his preparation for his profession. He also became a father. The mother is also a resident of the children´s home. Before the child was born he had a beautiful idea that he would start to work, find a flat, get married to I. and then they would have a child. Now he has to solve this life situation. We think that Marek is a person that is capable of looking after himself in life.

4 CONLUSION

Intervention in children living in children´s homes has its specificities which are linked with the life scenarios of the concrete children in the group regarding their past, present, as well as the future. In this chapter we presented the case of a girl who actively participated in the intervention and who showed development and shifts in controlling her own behaviour. This example of our research points to the possibilities of using drama in education for strengthening socialisation processes in a target group of children.

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Primary Paper Section: A

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RIGHT OF WITHDRAWAL ACCORDING TO THE NEW PROPOSAL OF REGULATION ON COMMON EUROPEAN SALES LAW IN COMPARISON WITH THE CZECH CIVIL CODE (CHOSEN QUESTIONS)

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This paper deals with the right of withdrawal according to the Czech Civil Code in comparison with the proposal of Regulation on Common European Sales Law

Keywords: withdrawal, termination, effects of withdrawal, Regulation on Common European Sales Law, Czech Civil Code, consumer

1 Introdaction

In this paper we focus on the research of the legal institute of withdrawal. The main starting point for us to explicate the institute of withdrawal will be the legislation according to the proposal of Regulation on Common European Sales Law[1] compared with the Czech Civil Code. It will not be forgotten the fact that it currently is going through the Czech Parliament the proposal of the new Czech Civil Code[2], which is newly adjusted the Civil Law materia.

Withdrawal from the contract is a shared common European value. It becomes therefore an interesting source of the knowledge of how the various common European legal projects (as PECL, DCFR and the others) grips the right of withdrawal or how the emerging European legislation provides this right. It is particularly also interesting the situation in which the Czech republic (CR) is because of there is process of adopting the new Civil Code. This situation offers the possibility to compare the different approaches of currently discussed draft of the new Civil Code, especially if the newly adopted version responds to developments of this issue at EU level.

The main part of this paper will be fixed on the withdrawal in consumer matters, when the general grounds of the Institute of withdrawal will be limited only to the minimum necessity, especially with regard to the scope of the proposal of Regulation on Common European Sales Law, which will be confronted with Czech legal reglementation of this issue.

2. Withdrawal de lege lata according to the Czech civil code

2.1 Right of withdrawal from a contract according to the Czech Civil Code – basis of the legal reglementation

„*The withdrawal from contract is unilateral, addressed and explicit legal act, which leads to the termination of the contract from the beginning when it is performed according to the law.*“[3]

Withdrawal from the contract as a legal act shall meet certain conditions to ensure that it will be the legal act (conceptual features of a legal act) as well as certain formalities of a legal act to be valid and caused the required legal consequences (the particulars features of the legal act). The conceptual features of the legal acts provided by § 34 of the Civil Code., provides: „*Legal act shall be defined as an expression of will directed in particular to rise, change or extinction of rights or duties connected with such expression by legal regulations.*“

By using analysis of this rule we reach these four conceptual features of a legal act and thus withdrawal from the contract:

1) expression of the will, 2) focus of the expression of the will, 3) recognition of the expression of the will by law, 4) the legal consequences, which the acting person in his expression of the will intended to cause[4]

The fulfillment of these conceptual characters is required to perfection, of the legal act. It is still necessary to distinguish the validity of a legal act, which is based on fulfilling of requirements of the legal act, which are categorized as follows:

1) entity, 2) will, 3) expression, 4) relation between will and its expression, 5) subject[5]

By accomplishing of these requirements is a legal act valid. The withdrawal has to also meet the need that this legal act has to get into the sphere of the addressee of this unilateral legal act, while maintaining the required form of legal act (theory of delivery), to lead to the cancellation of the contract.

Withdrawal from the contract according to § 48 paragraph 1 of the Civil Code allows the application of this institute only in two cases. The first case is the possibility to withdraw from the contract if it is provided by law and the second is the situation when parties of a contract agree with this possibility. A special provided option to withdraw from the contract is necessary to consider also the possibility of withdrawal from the contract concluded in distress and at arm's length[6]. The whole provision of § 48 of the Civil Code serves as a general clause governing this institution of withdrawal in the Czech Civil Code. Institute of withdrawal is adapted very broadly in the Civil Code. There is very poor regulation in connection with the right of withdrawal especially with regard to solving the state caused by resignation, withdrawal effects of treatment, rights and obligations after withdrawal and the other, which in practice raise many doubts and problems. Based on the duality of Czech contract law (Civil and Commercial Code), we have to conclude that modifications of withdrawal contained in the Commercial Code are much more socially desirable and more detailed, although even we can find many doubts in connection with this issue.

2.2 The Right of Withdrawal in the consumer affairs lege lata

"*The consumer contracts are not a special type of contract in accordance with EU legislation, the consumer contracts are contracts in which the consumer acts as a person which is not in business position. The provisions of § 52 of the Civil Code requires that the position of either Party performing the contract shall be trader and the consumer, which for these purposes are defined dynamically.*"[7] The definitions of consumer contracts and the notions of consumer and supplier are made precisely in § 52 paragraphs 1 to 3. The first paragraph deals with the rule, that a consumer contract is for example the purchase contract, contract for work, or other contracts, but only if the parties are consumer on one side and the supplier on the other. The second paragraph provides that the contractor is the person who acting within their business or other entrepreneurial activities in the connection with the contract. On the contrary, the consumer is such a natural person who, during conclusion of the contract and performance, is not acting within his business or other

[1] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a Common European Sales Law, COM(2011) 635 final, page nr. 19, point 26; http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0635:FIN:EN:PDF
[2] The proposal of the new Czech Civil Code, accesible from: http://obcanskyzakonik.justice.cz/cz/uvodni-stranka.html
[3] Jiří Mikeš, Jiří Švestka. Odstoupení od smlouvy ve vztahu ke kupní smlouvě o převodu nemovitosti. *Právní rozhledy* 7/2000, s. 284 – Translation: Withdrawal from contract in relation with purchase contract about trasfer o real property
[4] the same in Jan Hurdík, Josef Fiala, Milana Hrušáková. *Úvod do soukromého práva*. 3. nezměn. vyd., Brno : Masarykova univerzita, 2006, str. 151 – Translation: Introdaction into the private law
[5] again page Nr. 152
[6] § 49 Czech CC
[7] Fiala, J. a kol., *Občanské právo*. Praha: ASPI, a.s., 2006, str. 186 – Translation: Civil law

entrepreneurial activity. The Consumer can be an individual entrepreneur.
Withdrawal from consumer contracts is unique thanks to the fact that the consumer may withdraw from the contract, if permitted by law as a way to his advantage, or for breach of contractor's obligations. Basically at the same time, the consumer is not obliged to indicate the reason for withdrawal. In contrast, the possibility to withdraw from the contract for the supplier is greatly reduced. Withdrawal from the contract in the consumer relations thus showing differences compared to the general conditions for the withdrawal, particularly in terms of consumer advantage, which is justified by its weaker position (the function of protecting the weaker contracting party).

The general rules governing consumer contracts are involved in the provisions of § 55 and 56 of the Civil Code. Contractual arrangements can not derogate advantages given by the law to the consumer, it means that these mandatory rules can not be changed to consumer disadvantage. Arrangement as a benefit of consumers, which goes beyond the law, is allowed. The important one rule is also the modification of interpretation of consumer contracts. Section 55, paragraph 3 of the Civil Code provides that: "In case of doubts about the meaning of consumer contracts the interpretation favorable to the consumer prevail."[8] The wording favorable to the consumers, however, does not correspond to the Council Directive 93/13/EEC from 5 April 1993, which in its Article No. 5 uses the term most favorable to the consumer[9]. It is therefore a possible conflict with the Directive. This probable conflict should be resolved by interpretation. The national law should be interpreted in harmony with the decisions of the Court[10] according to the ECJ[11] case law. Therefore, this provision should be interpreted as the most favorable as possible for consumers. But the Consumer protection can not reach such an extent to make impossible the free determination of subject matter (performance) of the contract and price for services or goods. This would be in direct contradiction with the essence of the performance of business activities or other trading activities, but also unduly restrict the contractual autonomy of the parties. Therefore, § 56, paragraph 2 of the Civil Code provides that the provisions of § 56 paragraph 1 of the Civil Code does not apply to contractual agreements, which define the subject of the contract or the price of performance.

Directive of the European Parliament and Council 97/7/EC of 20 May 1997 regulates the protection of consumers in respect of distance sales contracts. This amendment responds to the development of new modern way of communication. The Directive in its Article 6 establishes the right of withdrawal, providing: "*For any distance contract the consumer shall have a period of at least seven working days in which to withdraw from the contract without penalty and without giving any reason. The only charge that may be made to the consumer because of the exercise of his right of withdrawal is the direct cost of returning the goods.*"[12] The transposition into the Czech legal order is made in § 53 of the Civil Code, where paragraph 7 states: "*If the contract is concluded by using distance communication, the consumer has the right to withdraw within 14 days from over-take (acceptance) of the performance without giving any reasons and without any penalties. In the event that the contractor did not submit information to the consumer, which is required to be submitted in writing or other similar manner in accordance with paragraphs 4 and 6, is the deadline for withdrawal 3 months after the acceptance of performance. However, if the information is properly submitted during longer period, than the 14 days period begins to run*." We can see that the transposition into the Czech legal system is more favorable to consumers than the minimum standard by the Directive requires. Firstly, by being granted a longer period than seven days[13], and secondly by the fact that for providing services the Czech law is distinguished between a different beginning of the period for withdrawal. The Directive provides the beginning of the period for exercising the right from the time the contract was concluded, while the Czech Civil Code from take-over of performance. This is valid also for applying the "extended" three-month period in the event of a breach of information duties. The withdrawal is in some cases impossible, unless otherwise expressly agreed[14]. If the withdrawal occurs according to § 53 paragraph 7 of the Civil Code, then a mutual obligation of restitution arises. The general provisions for restitution duty are covered by § 457 of the Civil Code[15]. The restitution obligation in connection with the right of withdrawal from distance contract is being modified by § 53 paragraph 10 of the Civil Code, which states: "*If the consumer exercises the right of withdrawal pursuant to paragraph 7, the Contractor is entitled only to reimbursement of actual costs associated with returning the goods. The supplier is also obliged to return the amounts paid by the consumer within 30 days of withdrawal.*" This is a transposition of Article 6, paragraph 2 of the Directive of the European Parliament and Council Directive 97/7/EC[16].

Another possible way how to negotiate a contract is a contract negotiated away from business premises. Such a negotiated contract is quite often connected with abuse of a lack of time, which can lead to irrational consumer purchases. Council Directive 85/577/EEC dated 20 December 1985 brought a fundamental revision of this issue. Czech legislator implemented the directive in § 57 of the Civil Code. The transposition of the Directive into the Czech law has brought a higher level of protection for consumers than is required by the Directive. It was chosen a longer period for withdrawal - the consumer can withdraw from the contract in writing within 14 days after its conclusion (Directive requires a minimum of 7 days from fulfillment of the obligation to inform consumers in writing about the right of withdrawal)[17]. If, however, supplier has not yet fulfilled the supply of goods or services, then the consumer may withdraw from the contract without giving reasons and without any penalty up to 1 month. If the consumer has expressly arranged the visit of the supplier to order something, then the consumer cannot exercise the right of withdrawal which is given to him in connection with the conclusion of the contract negotiated away from business premises. The supplier must also notify the consumer in writing about the right to withdraw from the contract not later than when contract was concluded. The written notice must include designation of the person by which the right can be exercise, including the residence or domicile of such person[18]. The transposition into the Czech law is better for the consumer because of the fact that if the information obligation about the right to withdraw is not observed by the trader, then the consumer has the right to withdraw from the contract within one year after its conclusion. Council Directive 85/577/EEC only requires: "*Member States shall ensure that their national legislation lays down appropriate consumer protection measures in cases where the information referred to in this Article is not supplied*."[19] The consumer protection in connection with contracts negotiated away from business premises is excluded for some cases.[20]

[8] See also s § 35 Czech CC. Rules for interpretation
[9] Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts [online]. [20.1.2012]. accesible from: <http://eur-lex.europa.eu> „...Where there is doubt about the meaning of a term, the interpretation most favourable to the consumer shall prevail...."
[10] if the national law leads to more possible interpretations, then it is necessary to use that interpretation which responds to the aim intended by the Directive; judgement of ECJ C-106/89 [online]. [14.1.2012]. accesible from: <http://eur-lex.europa.eu>
[11] European court of justice
[12] Ar. Nr. 6 par. 1 Directive 97/7/EC of the European Parliament and of the Council of 20 May 1997 on the protection of consumers in respect of distance contracts
[13] in the each EU Member State we can find different periods, compare: Hans Schulte-Nölke and Andreas Börger. Accesible from: <http://www.eu-consumer-law.org/consumerstudy_part2e_en.pdf> [online]. [21.1.2012]. page 54 etc.
[14] § 53 paragraph 8 Czech CC
[15] Part about unjustified enrichment
[16] „Where the right of withdrawal has been exercised by the consumer pursuant to this Article, the supplier shall be obliged to reimburse the sums paid by the consumer free of charge. The only charge that may be made to the consumer because of the exercise of his right of withdrawal is the direct cost of returning the goods. Such reimbursement must be carried out as soon as possible and in any case within 30 days."
[17] Ar. 4 and 5 Council Directive 85/577/EEC of 20 December 1985 to protect the consumer in respect of contracts negotiated away from business premises [online]. [20.1.2010]. accesible from: <http://eur-lex.europa.eu>
[18] § 57 par. 2 Czech CC. Information duty raised from Ar. 4 Directive 85/577/EEC
[19] Ar. 4 Directive 85/577/EEC in fine
[20] § 57 par. 4 Czech CC

With regard to the aim of this paper, we will not further discuss the concept of the institute of withdrawal affecting: 1) the sale of goods in store, 2) distance contracts for financial services 3) time-sharing, 4) travel contracts, although these legal areas are also important and interesting especially in the field of consumer protection.

3. Withdrawal according to the new proposal of regulation on Common European Sales Law

The proposal of Regulation on Common European Sales Law responds to a very long solved question about changes in the consumer Acquis. This question was solved for a long time and the proposal is the output in the form of legislative action as the contribution to solve the problems connected especially with the cross-border sale. The cross-border sale is today complicated for traders and consumers. The legislation is nowadays confusing, different and bringing a high level of uncertainty and increased costs to overcome these shortcomings due to fragmentation of legislation, directives and national rules. The new proposal is thereby preventing the free movement of goods and related services. Participants will be able to opt (choose) the rules contained in this regulation. It means that the regulation will be not generally binding but gives the freedom to the parties to choose whether to use the proposal and will be bound by it or not. The choice of option to use the regulation or not is like a bridge to overcome problems connected with opinions of many members states of EU about common European set of rules in the field of private law. Many members states are sensitive about intervention into their Civil Codes or other rules in the field of private law due to their long legal tradition and regard to the fact that national legislation in these countries is understood as a cultural value.

The rules according to the Common European Sales Law provide the matters of contract law that are of practical relevance during the life cycle of the types of contracts falling within the material and personal scope, particularly those entered into online. Apart from the rights and obligations of the parties and the remedies for non-performance, the Common European Sales Law should therefore govern pre-contractual information duties, the conclusion of a contract including formal requirements, the right of withdrawal and its consequences, avoidance of the contract resulting from a mistake, fraud, threats or unfair exploitation and the consequences of such avoidance, interpretation, the contents and effects of a contract, the assessment and consequences of unfairness of contract terms, restitution after avoidance and termination and the prescription and preclusion of rights. It should settle the sanctions available in case of the breach of all the obligations and duties arising under its application.[21] The right to withdraw from the contract concluded between the trader and the consumer as distance contract or away from business premises is covered mainly in Chapter 4 of the draft regulation.

3.1 Withdrawal according to the proposal of regulation on Common European Sales Law

Proposal of the regulation in great detail regulates the right to withdraw from the contract concluded between the trader and the consumer at a distance or away from business premises in its Chapter No. 4, Article 40 and followings. These rules are unilateral mandatory (can not worsen the position of consumers, but it is possible to favor him beyond the proposal of the regulation). The proposal of the directive also covers provisions on information duties, which affect also the obligation to inform the consumer about the right of withdrawal and the manner of its exercise, both before the conclusion of the contract itself[22] [23] and then the proposal also covers additional disclosure requirements and confirmation. The article 18, paragraph 2 provides that if the consumer requests to start the providing of services related to goods and delivery during the period for withdrawal referred to in Article 42, paragraph 2, the trader owes the duty to ask the consumer to submit the application on durable medium. This obligation applies to both Contracts concluded away from business premises as well as the Distance Selling (contracts). If the trader fails to provide such information in accordance with the proposal, then such a breach has negative consequences, for example, if the trader does not inform the consumer about the right of withdrawal under Article 17, paragraph 1, the deadline for withdrawal expires one year after the end of original deadline for withdrawal or if the trader provides required information to the consumer within one year after the original deadline for withdrawal, then the withdrawal period expires after fourteen days from the date after the date when consumer receives required information.

Within the period of 14 days from over-take of goods[24] the consumer has the right, without giving any reasons and without incurring any costs have been charged (unless explicitly stated otherwise), the right to withdraw from distance contracts or contracts negotiated away from business premises, if the contract price exceeds 50 EUR or equivalent amount in the currency, which was negotiated for the contract price at the time of conclusion. This right shall not apply in the case of contracts using vending machines or automated commercial premises, contracts for the supply of food, beverages and other goods intended for current consumption in the household and the trader is physically delivered to the consumer's home, place of residence or to his workplace through frequent and regular supplies, contracts for the supply of goods or related services whose price depends on fluctuations in the financial market, which the trader cannot control and which may occur within the period for withdrawal, contracts for delivery of goods or digital content, which were created according to the consumer's requirements or adapted to his personal needs or goods, which is perishable or has a short period of time for consumption and others, see Article 40, paragraph 2 and 3 of the proposal of regulation. Withdrawal from the contract leads to termination of obligations of both parties according to the contract in connection with fulfillment of the contract or in connection with the duty to conclude the contract where the consumer has made an offer. These generally provided effects are modified by an accurate determination of modified rights and obligations of both the parties (trader and consumer) in case of withdrawal, those rights and responsibilities are laid down in Articles 44 and 45 of the proposal of regulation.

3.2 Obligations of the trader and the consumer in the event of withdrawal[25]

The trader must reimburse all payments received from the consumer, including, where applicable, the costs of delivery without undue delay and in any event not later than fourteen days from the day on which the trader is informed of the consumer's decision to withdraw from the contract. The trader must carry out such reimbursement using the same means of payment as the consumer used for the initial transaction, unless the consumer has expressly agreed otherwise and provided that the consumer does not incur any fees as a result of such reimbursement. The trader is not required to reimburse the supplementary costs, if the consumer has expressly opted for a type of delivery other than the least expensive type of standard delivery offered by the trader. In the case of a contract for the sale of goods, the trader may withhold the reimbursement until it has received the goods back, or the consumer has supplied evidence of having sent back the goods, whichever is earlier, unless the trader has offered to collect the goods. In the case of an off-premises contract where the goods have been delivered to the consumer's home at the time of the conclusion of the

[21] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a Common European Sales Law, COM(2011) 635 final, page nr. 19, point 26; http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0635:FIN:EN:PDF

[22] Ar. 13 par. 1 e) the rights of withdrawal, in accordance with Article 17; the proposal of Regulation on Common European Sales Law

[23] Ar. 17; the proposal of Regulation on Common European Sales Law

[24] Detailss are provided by Ar. 42; the proposal of Regulation on Common European Sales Law

[25] the proposal of Regulation on Common European Sales Law

contract, the trader must collect the goods at its own cost if the goods by their nature cannot be normally returned by post.

The consumer must send back the goods or hand them over to the trader or to a person authorised by the trader without undue delay and in any event not later than fourteen days from the day on which the consumer communicates the decision to withdraw from the contract to the trader, unless the trader has offered to collect the goods. This deadline is met if the consumer sends back the goods before the period of fourteen days has expired. The consumer must bear the direct costs of returning the goods, unless the trader has agreed to bear those costs or the trader failed to inform the consumer that the consumer has to bear them. The consumer is liable for any diminished value of the goods only where that results from handling of the goods in any way other than what is necessary to establish the nature, characteristics and functioning of the goods. The consumer is not liable for diminished value where the trader has not provided all the information about the right to withdraw. The consumer is not liable to pay any compensation for the use of the goods during the withdrawal period. Where the consumer exercises the right of withdrawal after having made an express request for the provision of related services to begin during the withdrawal period, the consumer must pay to the trader an amount which is in proportion to what has been provided before the consumer exercised the right of withdrawal, in comparison with the full coverage of the contract. The proportionate amount to be paid by the consumer to the trader must be calculated on the basis of the total price agreed in the contract. Where the total price is excessive, the proportionate amount must be calculated on the basis of the market value of what has been provided.

The consumer is not liable for the cost for:

(a) the provision of related services, in full or in part, during the withdrawal period, where: the trader has failed to provide information in accordance with Article 17(1) and or the consumer has not expressly requested performance to begin during the withdrawal period in accordance with Article 18(2) and Article 19(6);

(b) for the supply, in full or in part, of digital content which is not supplied on a tangible medium where: the consumer has not given prior express consent for the supply of digital content to begin before the end of the period of withdrawal referred to in Article 42(1); the consumer has not acknowledged losing the right of withdrawal when giving the consent; or the trader has failed to provide the confirmation in accordance with Article 18(1) and Article 19(5).

The consumer does not incur any liability through the exercise of the right of withdrawal. It should be noted that Article 85 provides terms and conditions, which are presumed to be unreasonable and therefore invalid. We will show here only those that operate with the concept of withdrawal. The unreasonable terms are such terms that f.e. allow the trader to withdraw from the agreement based on the free discretion, if the same right is not reserved also to the consumer. Another one unreasonable term is the possibility that the trader may withdraw from the contract without restoration of the amount paid by consumer for services, which still has not been provided or such terms which provides that the price of goods, digital content and related services will be determined at the time of supply or provide, or terms allow the trader to increase the price without providing the consumer with the right to withdraw from the contract if the increased price is too high in relation to the price agreed when the contract was concluded. It does not apply to price-indexation clauses, if it complies with the law, provided that the method by which prices vary is explicitly described.

4. CONCLUSION: SUMMARY COMPARISON OF WITHDRAWAL FROM THE contract (CZECH CIVIL CODE – DRAFT of the NEW CIVIL CODE – DRAFT of Regulation on Common European Sales Law)

The existing consumer Acquis is widely incoherent and many guidelines cause some problems in the field of implementation into the national law systems. Another aspect is the fact that in the current situation is chosen minimum level of consumer protection on national level, which leads to significant differences in the legal systems of the Member States. This differences cause considerable problems to the traders, for whom it is difficult to observe legislation of all the Member States if they want to supply goods or services in the territory of another Member State and it is also difficult for the consumer who can feel threatened to conclude the contract with a foreign entity, without certainty about his rights. These problems, but also the others led to a review of the consumer Acquis. The Right of withdrawal has important position in the system of private law. However, the Directives itself do not exactly stated the exercise of the right of withdrawal and leave the specific solution of this question on the national level. This further strengthens the fragmentation of approaches and leads to a reduction of the single market. There are also important fragmentation and small interconnection of particular directives, which are leading (in some cases) to non-conceptual solutions. Moreover, under the influence of fragmentation of this issue in many directives we find legal conception in the Czech Civil Code, as chaotic and very confusing, which attenuates the primary purpose of these rules, which is consumer protection, as the weaker party of a contract.

The new draft of Czech Civil Code brings a lot of improvements and reacts to some questionable parts of the current applicable legislation. The improvements include mainly the effects of withdrawal, where the socially more appropriate regulation covered in the Commercial Code was used as basis for the New CC. However, we do not understand the intention, why the effects of withdrawal were stated again ex tunc (as in the current CC). However, it is true that the subsequent modification of these effects makes this issue no so important, but some doubts in connection in this regard remain. At least the question arises: why the law shall pretend that the legal relationship is invalid from the beginning, when it in fact was valid and according to it the obligation was perhaps fulfilled. Setting down the effects of withdrawal ex nunc is more appropriate and better meets the needs and interests of the parties, but also promotes legal certainty of course with observation of the possibility that the parties can negotiate other solution. Further positive aspect is that the proposal of new CC solved the situation that some guidelines have been not implemented in harmony with EU law, f.e. preservation of the withdrawal period (in consumer relations), if the act of withdrawal was sent before the expiry date, but not been delivered. We can see the birth of a general regulation of consumer relationships in the new proposal of CC, but under the influence of knowledge about the solution according to the draft regulations on the sale of goods, which is detailed, it can be said that this opportunity has not been fully exploited, especially with regard to the general information duties of trader in relation with the consumer or the general provisions governing the right to withdraw from the contract that governs the particular consequences (rights and obligations) after withdrawal. We consider the mutual obligation of restitution, respectively obligation to return the performance as the most controversial result in connection with the withdrawal. The draft of the new CC solved this issue again (such as the current state lege lata) under the provisions of unjustified enrichment (with minor modifications for consumer relations). In our opinion the withdrawal thanks to its specific characteristic and differences deserves a specific regulation which will adopt its differences.

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THE EU AND THE PHENOMENON OF CROSS-BORDER HEALTHCARE – LOOKING FOR THE "WAY"

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Abstract: The presented paper deals with the selected issues of providing healthcare in the EU mainly from the perspective of cross-border healthcare. The author suggests some of the historical milestones of the topic of cross-border healthcare and stresses the relevance of the decisions of the European Court of Justice/Court of the EU to this end. At the same time, the author looks at the topic from the perspective of public administration (administrative law) and introduces the reader to the main substantive elements of the issue (e.g. types of healthcare in the EU law). In the final part of the paper, the author analyses the issue of prior authorisation as set forth by the Directive 2011/24/EU of the European Parliament and of the Council on the application of patients´ rights in cross-border healthcare.

Keywords: healthcare, cross-border, authorisation, compensation, EU, insurance, administrative body

1 General Introduction

One of the key assets of any individual is his/her health as one of the main preconditions of a happy life. Nevertheless, the health "status" of an individual is not a purely individual matter any more. There are no doubts about the fact that the "fitness" of the society has many impacts on the society as a whole – including issues of social benefits, unemployment rates, numbers of healthcare facilities in the country etc. The history is full of cases in which serious diseases have lead to a massive reduction of the society or its sections (e.g. the poor). Healthy individuals form/make up a healthy society. At the same time, a healthy society creates benefits but normally requests much less from public budgets. For this – and a number of other reasons - the protection of the health of human beings has been a central issue of most civilised nations and their governments for a number of decades (or may be even centuries). Member States of the EU do not represent any exception to this rule and the same applies to the EU as a whole. Knowing this, it is not surprising that the EU puts enormous effort into protecting the health of its citizens and into the improvement of healthcare in all Member States. Since health care standards in different Member States may vary greatly, citizens of the EU may be interested in "healthcare motilities" in order to take advantage of cross-border health care. In other cases, it is a matter of necessity, rather than an issue of options or choice.

In reference to the notion of health being one of the most important assets of any society, the Treaty on the Functioning of the EU (TFEU) in **Article 168**[1] **par. 1**[2] stresses, that the EU when defining and implementing EU policies and activities must ensure high level of protection of human health. When looking at the wording of the Article, it is obvious that although the Union wishes to achieve a high level of protection of human health, it does not (legally) strive to achieve the highest one. The next section of the very same Article declares that „Union action, which ***shall complement national policies***, shall be directed towards improving public health, preventing physical and mental illness and diseases, and obviating sources of danger to physical and mental health...." by which it suggested that EU policies ought to complement the national health policies of Member States. Paragraph 7 of the above Article further stresses the notion of subsidiary especially by stipulating that EU action „***shall respect the responsibilities of the Member States***" for the definition of their health policy and for the organisation and delivery of health services and medical care.

It is worth noting that Article 168 of the TFEU (in comparison to the previous primary provisions on public health) provides for the possibility of introducing incentive measures to be adopted by the European Parliament and the Council (with the ordinary legislative procedure and after consulting the Committee of the Regions). Nevertheless, incentive measures must not be aimed at the harmonisation of the laws of the Member States and must relate to the topic of protection and improvement of human health. At the same time, Article 168 of the TFEU makes it possible for the Council to adopt recommendations on matters of public health (on the proposal from the Commission).

In order to conclude this very general and incomplete introduction into the system of healthcare policy and public health matters in the EU, one must mention **Article 9** of the TFEU and **Article 36** of the TFEU. According to the former, in defining and implementing its policies and activities, the Union shall take into account requirements linked to the promotion of a high level of employment, the guarantee of adequate social protection, the fight against social exclusion, and a high level of education, training and "***protection of human health*".** The latter Article, on the other hand and in reference to the prohibition of quantitative restrictions defines that the provisions of Articles 34 and 35 of the TFEU shall not preclude prohibitions or restrictions on imports, exports or goods in transit justified on grounds of public morality, public policy or public security and ***the protection of health and life of humans, animals or plants***; […] Such prohibitions or restrictions shall not, however, constitute a means of arbitrary discrimination or a disguised restriction on trade between Member States"[3]. Last but not least, one can also mention Article 191 of the TFEU according to which the "Union policy on the environment shall contribute to pursuit of the following objectives: –preserving, protecting and improving the quality of the environment,–***protecting human health***–[...]". In order to continue the list of non-health related Articles having an effect on health issues, the following Articles of the TFEU could be mentioned: **Article 45** (the free movement of persons as guaranteed by EU law may be an issue form the perspective of cross-border healthcare), **Article 114 par. 3** (calls for the protection of human health when establishing internal market policies), **Article 153** (the Union supports Member States in protecting ***workers' health*** and safety) and **Article 169** (states that the Union shall contribute to "protecting the health, safety […] of consumers as well as promoting their right to information systems). Lastly the topic of sustainable development is touched in various Articles of the primary treaties and this, of course, has various links to health care and the protection of health of individuals.

At the same time, some space needs to be devoted to the topic and dimensions of public health as defined by the Charter of Fundamental Rights of the European Union (also referred to as "the Charter" later on). In general, the articles of the Charter (as to the issue of public health) can be categorised into two major groups. The first being the articles which have an **implicit effect** on health care and health issues and the second "group" **(the "explicit" one)** represented by **Article 35** of the Charter. **Article 1** of the Charter deals with human dignity, which indeed may relate to the way healthcare is provided. **Article 2** of the Charter safeguards the right to life, **Article 3** protects the integrity of the person, **and Article 8** focuses on the protection of personal data (which is applicable also in the case of providing healthcare). On the other hand, the rights guaranteed by **Article 10** of the Charter (freedom of conscience, belief and religion) may also interfere or collide with health care issues from the perspective of. **Article 26** of the Charter ensures the proper integration of individuals with disabilities into the society which logically means it has a direct link to the topic of healthcare. If we take the "extreme route" even **Article 4** (prohibiting degrading and inhuman treatment) and **Article 7** (respect for private and family life) may touch the topic of public health. Article 25 (*The rights of the elderly*) could also be categorised into the class of Articles having an implicit connection to the quality of healthcare. Although the above articles do not relate to health care

[1] Public Health was previously dealt with in Article 152 of the EC Treaty.
[2] Article 168 par. 1 TFEU *„A high level of human health protection shall be ensured in the definition and implementation of all Union policies and activities."*

[3] Article 34 TFEU: „Quantitative restrictions on imports and all measures having equivalent effect shall be prohibited between Member States.", Article 35 TFEU: "Quantitative restrictions on exports, and all measures having equivalent effect, shall be prohibited between Member States."

specifically, due to their nature, they may be applicable since they have an implicit effect on the issues of public health. On the other hand, **Article 35** of the Charter stipulates that *"Everyone has the right of access to preventive health care and the right to benefit from medical treatment under the conditions established by national laws and practices. A high level of human health protection shall be ensured in the definition and implementation of all the Union's policies and activities"*. Logically, this article has the most immediate effect on public health.
Lastly, we need to mention that **Article 11** par. 1 of the TFEU states that EU institutions should give citizens and representative organisation the opportunity to make their views known on all areas of Union action and that the institutions "shall maintain an open, transparent and regular dialogue with representative associations and civil society.", which can be referred to as the right to discuss opinions with the institutions of the EU. This provision provides a space for health related civil society organisations to get involved.

2 Introduction into the Topic of Cross-border Healthcare

Although cross-border health care within the EU has been in operation for some decades, one must add that at various stages of EC/EU development, cross-border healthcare was based on different pillars and principles.
The original idea of cross-border health care was based on the *freedoms* (freedom of movement of labour, capital, goods and services). However, at the very beginning of its application, Member States and their authorities have been reluctant to accept public health care within the system of cross-border services, since they believed it was not a matter of ***private commerce*** within the free trade community. Member States did not want to accept the application of EC law on the matter of cross-border health care believing that health care issues were governed purely by the national laws and that European law did not apply.
Later on, views on the topic started to change by making health services part of ***services*** **within the meaning of the EC Treaty.** For the first time in *Luisi & Carbone* (1984)[4] and then again in *SPUC v Grogan* (1984)[5] the Court acknowledged that health services are **deemed to fall within the ambit of the economic 'fundamental freedoms' of the EC.** However, the landmark cases often used to illustrate the system of healthcare from the point of law and legal development are the cases of *Kohll* and *Decker*. Mr. Kohll, a Luxembourg national, was seeking reimbursement for a dental treatment received (by his daughter) in Germany, without having received prior authorisation by his home institution. In this case, the Court made it clear that Articles 49 *et seq.* do apply to health services, even when they are provided in the context of a social security scheme. Or, as the Court put it: 'the special nature of certain services does not remove them from the ambit of the fundamental principle of freedom of movement. Hence, the requirement of prior authorisation did, indeed, constitute a violation of Article 49 (then 59) of the Treaty[6]. In this case the court held that the requirement of prior authorisation did, indeed, constitute a violation of Article 49 (then 59) of the Treaty. In the case of *Decker*[7] which was delivered the same day as Kohll the Court came to the conclusion that national security and healthcare schemes should also respect Article 28 of the EC Treaty on free movement of goods[8]. The result that healthcare is *a priori* subject to the Treaty rules was further explained confirmed and explained in the judgments in *Vanbraekel*[9] and *Peerbooms*[10], but also in the cases of *Müller-Fauré*[11] and *Watts*[12].

In the case of **Müller-Fauré / van Riet (1999), 2003**[13] the Court further confirmed that *"A medical service **does not cease** to be a provision of services **because it is paid for by a national health service** or by a system providing benefits in kind..."* The issue of cross-border healthcare is discussed from this perspective in the sections of the paper below.
However, one of the most important elements of the topic that needs to be clarified before proceeding to the next dimension of the topic is the issue of *remuneration* (being one of the key elements of a "service" as it was provided for in Article 49 and Article 50 of the EC Treaty). In the case of the *Belgian State v. Humbel (1988)* the Court held that *"the essential characteristic of remuneration lies in the fact that it constitutes consideration for the service in question and is normally agreed upon between the provider and the recipient of the service"*[14]. Nevertheless, this very concept has been altered by the Court in its later decisions. In *Smits and Perbooms* et al. the Court confirmed that remuneration may exist also in relations involving three parties (i.e. also the national health authorities and their funds – i.e. those relations in which the payment is provided by a third party – not directly by the one who receives the service). To this end, the Court has also confirmed that remuneration may be found to exist even in situations where the correlation between services

[4] Judgment of 31 January 1984 in joined Cases 286/82 and 26/83 *Luisi and Carbone* [1984] ECR 377, Rec. 16.
[5] Judgment of 4 October 1991 in case C-159/90 *Society for the Protection of Unborn Children Ireland* [1991]
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[7] Judgment of 28 April 1998 in case C-120/95 Decker [1998] ECR I-1831; see also before that judgment of 7
February 1984 in case 238/82 Duphar [1984] ECR 523.
[8] More facts on the cases will follow in the paper.
[9] *Judgement Vanbraekel (2001)*
Mr Vanbraekel tried to obtain reimbursement for orthopaedic surgery of his late wife Mrs Descamps (a Belgian resident with Belgian health insurance) received in a French hospital, for which she was wrongfully denied authorization, as a Belgian court would conclude after her return to Belgium. The question that faced the Belgian court was whether she should be reimbursed according to the Belgian tariff (as the Kohll ruling would imply for treatment without authorization), or the French tariff (as Council Regulation (EEC) No. 1408/71 implies and which was significantly lower). The ECJ ruled that lower reimbursement rates for treatment delivered abroad can discourage people from applying for authorization. Hence, this would constitute a violation of the free movement rules and, therefore, additional reimbursement covering this difference must be granted to the insured under the social security coordination mechanism.
[10] *Judgements Geraets-Smits/Peerbooms (2001)*
Dutch citizens Mrs Geraets-Smits and Mr Peerbooms were both refused reimbursement by their Dutch sickness funds for the costs of their hospital care abroad for "experimental" treatments for Parkinson's disease in Germany and neurostimulation therapy for coma patients in Austria, respectively. Neither had obtained prior authorization for these treatments (which were unavailable in the Netherlands) and they subsequently attempted to obtain refunds after returning home by using the procedure based on the free movement of services rules established in the Kohll case. The ECJ ruled identically in both cases, drawing on previous case law and reiterating that this hospital treatment is indeed an economic service in the sense of the EC Treaty, which can be obstructed by submitting it to authorization. However, the ECJ accepted in this case that for hospital services – requiring planning in order to guarantee a rationalized, stable, balanced and accessible supply of hospital services – the use of prior authorization was justified as long as it could be considered to be necessary, proportionate and based on objective, non-discriminatory criteria that are known in advance. This would mean, however, that authorization to receive treatment in another Member State could only be refused if the same or equally effective treatment can be obtained without undue delay from an establishment with which the insured person's insurance has an agreement.
[11] The case is analysed in brief in footnote no. 8.
[12] *Judgement Watts (2006)*
Mrs Watts, a 72-year-old British national was put on a waiting list for hip replacement. She was denied authorization by her Primary Care Trust (PCT) to have the surgery carried out in Belgium or France as, according to National Health Service (NHS) plan targets, the standard waiting time is 12 months. She was refused reimbursement for the treatment she finally underwent in France. In its judgement, the Court stated that the obligation to reimburse the cost of hospital treatment provided in another Member State also applies to an NHS which provides such treatment free of charge. In order to be entitled to refuse a patient authorization to receive treatment abroad on the grounds of waiting time for hospital treatment in the country of residence, the NHS must show that that the waiting time does not exceed a medically acceptable period, having due regard to the patient's condition and clinical needs. As to the reimbursement mechanisms, the Court ruled that in the absence of a reimbursement tariff in the United Kingdom, where hospital treatment is provided free of charge by the NHS, any possible user charge the patient would be required to bear in the Member State of treatment should be additionally covered by the competent country up to the difference between the cost (objectively quantified) of the equivalent treatment in the home country and the amount reimbursed pursuant to the legislation of the treatment country, if the latter would be lower – with the total amount invoiced for the treatment received in the host Member State as a maximum.
[13] *Judgement Müller-Fauré and Van Riet (2003)*
In the case of Mrs Müller-Fauré, an insured person under the Dutch health insurance, who preferred to be treated by a dentist in Germany, the Court confirmed that the principle of free movement of services would indeed preclude the use of prior authorisation for the reimbursement of non-hospital care provided in another Member State. This would not be changed by the fact that the Dutch health insurance operates as a benefit-in-kind system (as opposed to the Luxembourg restitution system in the Kohll and Decker cases). In the case of another Dutch insured individual, Mrs Van Riet, who went to Belgium for an arthroscopy because she could get it faster there than in her home country, the ECJ specified the concept of undue delay already raised in the Geraets-Smits/Peerbooms rulings. The Court stated that, in assessing whether waiting times are acceptable, national authorities are required to regard to all the circumstances of each specific case and to take due account not only of the patient's medical condition at the time at which authorization is sought (and, where appropriate, of the degree of pain or the nature of the patient's disability which might, for example, make it impossible or extremely difficult for her/him to carry out a professional activity), but also of her/his medical history.
[14] Judgment of 27 September 1988 in case 263/86, *Belgian State v. Humbel*, [1988] ECR 5365, para 17.

received and money paid is only indirect (e.g. paid on a flat rate basis irrespective of the nature and cost of the service provided) if economically nonexistent[15].

It is obvious, that in its landmark rulings on *Kohll and Decker*[16] and successive jurisprudence, the ECJ emphasized the applicability of the fundamental freedoms, enshrined within the EC Treaty, on statutory health care services. All citizens – service providers as well as recipients – should be able to benefit from the principles of free movement of services (for example, in terms of dental treatment) and goods (such as glasses and pharmaceuticals) in the single European market. Therefore, health care services purchased across the EU should be reimbursed as if they were provided in the country of affiliation. Any measure that would deter or prevent patients from seeking treatment in another Member State (or providers from offering their services) is to be regarded as an obstacle to free movement that only can justified by "overriding reasons of general interest" or the protection of public health. In that sense the Court ruled that submitting the reimbursement of treatment outside the country of affiliation to the condition of prior authorisation could only be upheld for hospital care, as free and unplanned cross-border hospital care could indeed seriously undermine planning and rationalisation efforts, causing imbalances in supply as well as wastage[17] [18].

On the following pages of the paper, we are providing a brief summary of some other case law relating to health care matters in order to provide the reader with additional information on the issues[19]

Judgement Ioannidis (2003)

In this case the ECJ ruled that Greece could not subject payment of the medical expenses of a pensioner incurred during a temporary stay in another Member State either to prior authorization or to the condition that the illness he suffers from has manifested itself suddenly and is not linked to a pre-existent pathology of which he was aware.

Judgement Inizan (2003)

In this ruling the Court explicitly confirmed the consistency of the prior authorization condition provided for in Article 22 of Council Regulation (EEC) No. 1408/71 with Articles 49 and 50 EC on the freedom to provide services. Since recourse to Council Regulation (EEC) No. 1408/71 offers insured individuals certain rights which they would otherwise not enjoy, the Community legislator is free to attach conditions to or determine the limits thereof. However, Regulation 1408/71 is only one way of exercising the right to the freedom to provide health care services. In this ruling the Court also initiatied the cumulative conditions of Article 22(2) under which prior authorization cannot be refused, in line with the earlier judgements in the case Smits-Peerbooms.

Judgement Leichtle (2004)

This ruling targeted German legislation governing the reimbursement of expenditure in respect of a health cure. The condition by which the statutory cover for this care provided outside Germany – namely, that it had to be established in a report drawn up by a medical officer or medical consultant to the effect that the health care was absolutely necessary owing to the greatly increased prospects of success outside of Germany – was held to be contrary to the freedom to provide services. The condition that health spas, in order to be eligible for statutory reimbursement, have to be listed in the Register of Health Spas, was not considered to be an obstacle if the conditions for registration were found to be objective and non-discriminatory.

Judgement Keller (2005)

A German national resident in Spain was authorized by the latter country to be treated in Germany (E112). However, German doctors referred her urgently for specialized treatment in Switzerland, without consulting the Spanish authorities. The ECJ stated that Spain could not require Mrs Keller to return to Spain for medical examination of the need for this referral and that it was bound by the clinical judgement of German doctors. Therefore, the cost of this treatment was required to be borne by the Spanish system.

Judgement Acereda Herrera (2006)

The assumption of the costs of travel, accommodation and meals of the insured person and the person accompanying her/him, in the case of hospital treatment in another Member State, depends on the mechanism by which these costs are met in the country in which they are insured.

Judgement Commission/Spain (2010)

Spain does not restrict the freedom to provide hospital care services (nor related tourist and educational services) by refusing the reimbursement of any user charges imposed on a Spanish insured person treated during a temporary stay in France. In this ruling the ECJ clearly distinguishes the case of an unscheduled treatment from that of a scheduled treatment in another Member State, as in the Vanbraeckel case, in which prior authorization was wrongfully denied.

3 Types of healthcare, the tool of "prior authorisation" and Directive 2011/24/EU

In order to provide the reader with a clear scheme of the general mechanisms of cross-border health care, first of all, we need to look into the issue, whether there are any types of health care at all (from the point of law and the perspective of health care in another Member State). If raising the question so, the answer is positive. Most importantly, there are two major types of healthcare as covered by EU legislation. The first type is usually referred to as **unforeseen medical treatment** (or unplanned medical treatment) and the other one is referred to us as **planned medical treatment** (or planned medical care). The difference between the two must be clear purely from their general description. Unplanned or unforeseen medical treatment involves usually an unexpected treatment that is provided to a person e.g. due to an accident he/she was involved in etc. on the territory of a Member State or other applicable state - other than his/her state of residence (or state where his/her social security system directly applies). On contrary to that, planned medical treatment is a treatment which is *the very reason* of the travel of the person. To simplify the whole difference: while in the first case the purpose of the travel is not the medical treatment itself but some other reason (e.g. tourism), in the latter case, the treatment is the very reason for the travel (the person travels abroad to get medical treatment). In case of unplanned medical treatment, such treatment may be provided to the person through the European Health Insurance Card which covers the cost of medical care during temporary visits abroad (this could include not only

[15] The ECJ Case Law on Cross-Border Aspects of Health Services. Briefing Note. IP/A/IMCO/FWC/2006-167/C3/SC1, January 2007. p. 5

[16] *Kohll and Decker judgements (1998)*
Mr Kohll and Mr Decker, both Luxembourg nationals, were refused reimbursement by their sickness fund. Mr Decker requested reimbursement for spectacles (goods) that he had bought in Belgium using a prescription from a Luxembourg ophthalmologist, whereas Mr Kohll requested reimbursement for a dental treatment (services) his daughter had received in Germany. Neither had obtained a pre-authorization from their home institution, as required. In both rulings, the ECJ affirmed that national social security schemes should also respect the fundamental principles of free movement of goods and services and concluded that submitting reimbursement to the condition of prior authorization constituted a hindrance of those freedoms. Such a hindrance could only be justified if it proved to be necessary for maintaining a balanced medical and hospital service accessible to all, a treatment capacity or medical competence on national territory which is essential for public health – and even the survival of the population – or for preserving the financial balance of the social security system. The ECJ found that in this case no overriding reason in the general interest was applicable, as reimbursement at the level of the home country would in no way threaten the financial balance or the quality of the health services in the home country. The rulings in the Kohll and Decker cases sparked intense political and scientific debate on their ambit and implications. As many open questions remained, for example on the scope (that is, whether it includes hospital care) as well as the implications for national health systems, it was evident that there was a need for further clarification, which was soon to be provided by the ECJ in its rulings in the cases Geraets-Smits/Peerbooms and Vanbraekel, all concerning the reimbursement of hospital costs incurred in another Member State than the home country.

[17] Case C 157/99 Geraerts-Smits and Peerbooms [2001] ECR 5473, para. 106.

[18] *Willy Palm, Matthias Wismar, Ewout van Ginneken, Reinhard Busse, Kelly Ernst and Josep Figueras :* Towards a renewed Community framework for safe, high-quality and efficient cross-border health care within the European Union, pp 24 – 25, In Cross-border Health Care in the European Union : ISBN 978 92 890 0221 9, UK : World Health Organization, 2011

[19] *Willy Palm, Matthias Wismar, Ewout van Ginneken, Reinhard Busse, Kelly Ernst and Josep Figueras :* Towards a renewed Community framework for safe, high-quality and efficient cross-border health care within the European Union, pp 26 – 29, In Cross-border Health Care in the European Union : ISBN 978 92 890 0221 9, UK : World Health Organization, 2011

holidays but also other types of short breaks and even some types of business trips etc.). The European Health Insurance Card is available to all citizens of any Member State and it is issued by the national healthcare (social) authority at which the person is insured.

In line with the sections above, by now it must be clear that along with the unplanned medical treatment, EU legislation deals also with issues of planned medical treatment. Under EU law, the person is entitled to a planned medical treatment in another Member State (or other applicable state) if:

a) the specific treatment the patient **needs is not available in his/her home country**, however, such treatment **would be covered by the national (statutory) health insurance**

b) the patient's situation **requires an early treatment**, however, in the country of origin the patient **might not receive the treatment in time**. The fact whether this situation exists is determined mainly by the patient's medical record. In most cases, the medical history of the patient, the degree of pain he/she suffers and the nature of disability are inspected.

If one of the above conditions applies, the person is entitled to medical care in another Member State subject to authorisation by a national healthcare (social security) authority.

From this perspective, the subcategories of planned medical care can be identified as follows:

A) **Hospital care (hospital treatment)** - sought by patients either to avoid long waiting lists in their countries or to receive specific treatment or a better quality health treatment

B) **Clinical (ambulant) treatment (non-hospital treatment)** – refers to receiving ambulant health care or buying health goods.

Such distinguishing is important, because the legal regime of the health care depends on the type of healthcare sought. As suggested above, the ECJ held that **prior authorisation is only justified for hospital care** but **not for non-hospital care, while hospital service is usually used in reference to those situations, in which the patient stays at the hospital for at least one night.** The importance of differentiating between the two categories of healthcare is relevant, since in the case of hospital care in another Member State than in the Member State of affiliation; prior authorisation provided by the national health authority is deemed justified.

In order to sum up the facts we know by now, the following facts can be outlined:

There are two types of medical treatment – unplanned and planned medical treatment. The unplanned medical treatment is covered in EU law primarily by the existence and application of the European Health Insurance Card. The planned health care is further subdivided into two major parts: hospital care and non-hospital care. In order to be provided with medical care in another Member State, the patient needs to request a prior authorisation from his/her national insurer. In case of non-hospital medical care such authorisation is not required, but is advisable from the point of reimbursement.

Clarifying the right to be treated elsewhere in the EU is also the underlying principle behind **the EU Directive on the application of patients' rights in cross-border healthcare (Directive 2011/24/EU).** It is important to note, that this Directive does not affect the benefits already offered to citizens through the existing Regulations on social security. Although the existing rules – which focus on social security agreements, not on patients' rights - have been in place since 1971, clarification was still needed on the rights of EU citizens to receive healthcare in another Member State. The European Court of Justice has confirmed[20] that the right to seek cross-border healthcare exists in the Treaty. In the case of Kohll, Decker et al., the ECJ announced (in reference to authorisations) that "*...such rules deter insured persons from approaching providers of medical services established in another Member State and constitute, for them and their patients, a barrier to the freedom to provide services*." This means that the requirement of an "*authorisation*" for the reimbursement of medical costs incurred in another Member State is an obstacle to the free provision of services for both patients and providers of medical services. However, different rules apply to different types of health services.

This inconsistency is to be replaced by the new rules as set forth by the Directive since it provides for a uniform and coherent framework for all citizens in Europe to take advantage of cross-border healthcare. The new (and somewhat clearer) rules relate to the remuneration/reimbursement of the services and to the issue of prior authorisation. According to the Directive, national authorities can introduce a system of "prior authorisation" in three cases:

1) for healthcare which involves **overnight hospital stay of at least one night**;

2) for **highly specialised and cost-intensive healthcare**;

3) in **serious and specific cases relating to the quality or safety the care provided abroad**; if the care provided abroad **would constitute a risk to the patient or the population.**

In the above three cases, patients may need to ask for permission in advance from their national health authority in charge of reimbursement. On the other hand, for reasons of fairness it must be added, that those national health authorities may **refuse authorisation** in the following cases:

a) if the treatment in question, or the healthcare provider in question, could present **a risk** for the patient or population;

b) if appropriate healthcare can **be provided at home in good time**.

If the national health authority refuses to issue an authorisation, it will need to provide its grounds of refusal, i.e. a solid reasoning will be required – in other words: the national health authority will need to explain the applicant the reasons behind its negative decision. In case of refusal, patients have the right to request a review of the administrative decision on cross-border healthcare for their individual case. On the other hand, if a treatment is unavailable in the "home" Member State of the patient or is not available in good time, the national health authorities must not refuse authorisation to a patient seeking healthcare in another EU Member State. However, patients will be reimbursed for such treatment provided it corresponds to the national "health benefits package" and the amount reimbursed is the amount the national health authority would pay for the treatment on its own territory. Transposition of the Directive into national laws will have to be carried out until 25 October 2013.

Summary / Conclusion

In the presented paper, the author has suggested the basic routes cross-border healthcare has taken in the law of the European Union. The starting point of the discussions was the fact whether cross-border healthcare falls under the scope of "*free movements*". The author provides the reader with the historical milestones relating to the issue and shows the turning points the topic has taken until it found its way into the category of "services" as stipulated by the Treaties. Nevertheless, it is clear that the topic has many other dimensions some which are rather sensitive and due to this fact, some space in the paper is devoted to the matter of prior authorisation by national health authorities and also to the applicable perspectives of remuneration. Since types of healthcare as defined by the EU law represent an important element of the topic, the author discusses these matters briefly in the third section of the paper. The third section of the paper deals also with some of the clarifications that the Directive 2011/24/EU will bring around once implemented into the national legal systems. Right now and by bearing in mind that the above Directive still accepts the *tool* of prior authorisation one can conclude that cross-border healthcare is still a question of finding the right balance between the individual interests of the particular patient and the public health interests of the society that are represented by the national health authority. The need for a prior authorisation and the reimbursement of health treatment according to the home standards of the patient may – under some circumstances – demotivate patients from taking advantage of the system of cross-border healthcare. On the other hand, such measures could be relevant when protecting the health system of some Member States (some of which are pretty imbalanced and imperfect).

[20] Kohll and Decker (1998); Ferlini (2000); Geraets-Smits and Peerbooms (2001); Vanbraekel (2001); Inizan (2003); Müller Fauré and Van Riet (2003); Leichtle (2004); Watts (2006); Stamatelaki (2007); Elchinov (2010).

Whatever the definite answer, it can only be presumed that a system with (some) obstacles and imperfections is always better not having a system of cross-border healthcare at all.

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Primary Paper Section: A

Secondary Paper Section: AG, AQ, FQ

TRENDS IN ELECTRONIC BANKING IN THE CZECH REPUBLIC

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Abstract: In recent years, the revolutionary technological advances have caused a substantial development in payment systems, not only in the Czech Republic, but all over the world. The Internet and other wireless communication technologies have not only changed the existing payment systems, they have even generated new ways and methods of providing banking services. This article focuses on the dynamics of the electronic banking in the CR. The goal of this paper is to track the latest trends in the electronic banking in the Czech Republic, and to detect the very near future of it. The paper focuses on the process of the replacement of the traditional brick-to-mortar banking by the click-to-mortar banking, and the replacement of cash transactions by cashless payments.

Keywords: electronic banking, payment cards, e-payments, m-payments, phone banking, GSM banking, home banking, internet banking.

Introduction

Financial services are now offered through a multitude of delivery channels, from traditional brick-and-mortar branches to wireless devices. Access devices are becoming many customers' first point of contact with financial services, rather than a teller or branch. The Internet and wireless communication technologies are dramatically changing the structure and nature of financial services, they are more than just new distribution channels, they are a different way of providing financial services. [1]

The aim of this article is to analyze the current trends of electronic banking in the Czech Republic, on the basis of foundations concerning evolution of the electronic banking, and own investigations of the current situation in this area. The paper will also track the latest trends and possible future of electronic banking in the Czech Republic.

Methodology used in this article encompasses a literature review, an analysis of the current situation on the electronic banking market in the Czech Republic, a comparison of selected indicators to the European Union, and own survey among the Czech banks concerning provided financial services.

1 Evolution of the electronic banking

Electronic banking (e-banking) in its very basic form can mean the provision of information about bank and its services via a home page on the World Wide Web (WWW). More sophisticated e-banking services provide customer access to accounts, the ability to move their money between different accounts, and making payments or applying for loans via e-Channels. [2]

E-banking is one form of e-commerce. Kalakota defines e-commerce as the delivery of information, products and services, or payments over telephone lines, computer networks, or any other electronic means. [3]

Some authors take for the very beginning of electronic banking the first credit card which was issued by the Western Union Telegraph Company in 1914. But generally we can say that electronic banking offers new ways for consumers to access their account balances, transfer funds, pay bills, and buy goods and services without using cash, nor even leaving home. So from this point of view, electronic banking, as a method of remote access to the bank account, has started with the home banking. Home banking began in the mid-1970s with the desire to reduce back-office check processing costs through bill payment. The first home banking system offered consumers the ability to make payments using offline applications, and used voice response technology to minimize personnel costs. Home banking service was based on the combination of a personal computer and modem.

On-line banking based on the World Wide Web [4] was first introduced in the early 1980s, when four major banks offered home banking services: Citibank, Chase Manhattan, Chemical, and Manufacturers Hanover. At this time, most home banking services with many different menus, lots of verification procedures and problems with remote communication, were very difficult to use. These e-banking services were mostly offered by traditional banks as a supplementary service and remote access to current or savings accounts.

At the beginning of 1990s, the first pure Internet bank Security First Network Bank was established in the USA. It was the first virtual bank which offered its services without stone bank branches. This process is often called as a shift from a brick-and-mortar to a click-and-mortar business. The term has been used since the development of e-commerce. [5]

Systems has changed and got more sophisticated, so nowadays electronic banking enables users not just to check current account balances and transfer funds among account, but many other miscellaneous services.

The combination of physical and web channels is currently a typical electronic commerce business model, applied even for the banking sector. Electronic commerce researchers use terms like "click and mortar" (see above), "bricks and clicks", "surf and turf", "cyber-enhanced retailing", or "hybrid e-commerce". [5]

2 Current trends in the electronic banking

To track the recent trends in electronic banking may appear as an interminable task. The current development of electronic wireless technologies, together with economic globalization, advances in telecommunications, improvement and invention of new financial products, etc. cause that the findings can become outdated very quickly.

The use of ICT (Information and Communication Technologies) in the Czech Republic

According to statistics of the Czech Statistical Office from 2010 and 2011, almost 65 per cent of the Czech population older than 16 years used computers (2.7 million households), and 62 per cent of them used the Internet (2.5 million households). As for the ownership of the personal computers, 59 per cent of the Czech households own one or more PCs, which is twice as much as in 2005. [6]

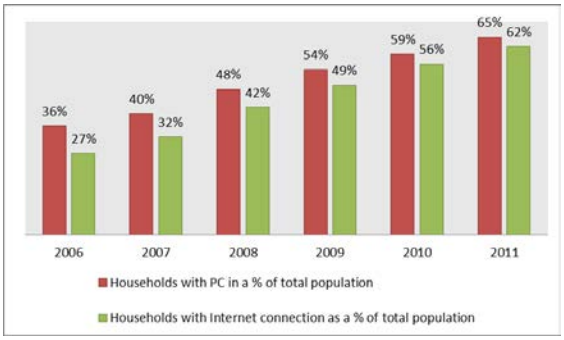

Fig. 1: The use of ICT by households in the Czech Republic
Source: Czech Statistical Office [7], own elaboration

The following figure shows the rapid development in the Internet access facility of the Czech households from 2006 (the Internet access was available only for 29 % of households in the Czech Republic) to 2010 (60 % of households). In comparison to the situation of the whole European Union, in the given period the growth was more perpendicular in the Czech Republic. Whereas in 2005 the Czech Republic was far below the average

of the EU in the field of Internet access, in 2010 it almost reached the level of the EU average Internet access facility.

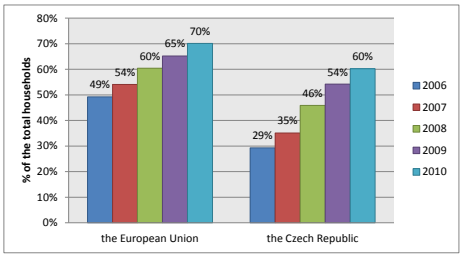

Fig. 2: Proportion of households with the Internet access (% of total households)
Source: Czech Statistical Office [8], own elaboration

3 Categorization of the electronic banking

The report of the European Commission called the Green Book published in January 2012 categorizes the instruments of electronic banking into three main groups: payment cards, e-payments and m-payments.

Payment cards are the most common and the most often used electronic payment instrument for retail payments. In terms of number of transactions, the payments by debit or credit cards accounted almost one third of all retail payments in 2009. In the EU (the CR), the total number of issued payment cards was about 726 million (9.3 million), which is 1.45 (0.89) card per inhabitant. [9]

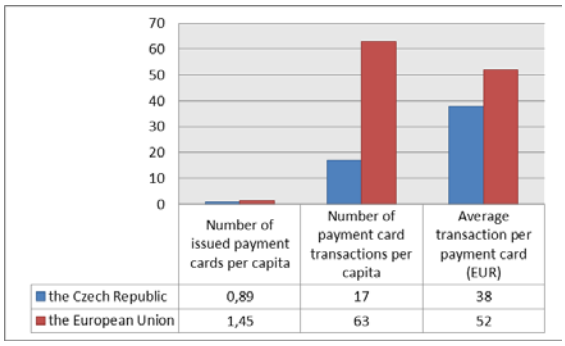

Fig. 3: Payment card statistics in the EU and the CR
Source: European Commission [9], own elaboration

E-payments are payment transactions carried out via the Internet. There are three basic types of e-payments:

- internet payment by a payment card,
- internet banking (payment order or direct debit),
- payments through the e-payments providers (also called electronic wallet, or purse).

M-payments are payments where the payment details and instructions are entered, transmitted or confirmed via mobile phone or similar electronic device. There are two main categories:

- remote m-payments based on WAP or SMS services,
- contactless payments based on the technology of the Near Field Communication.

4 Electronic banking in the Czech Republic

At present, electronic banking in the Czech Republic includes mainly Internet Banking, Home Banking, Phone Banking, WAP Banking, PDA Banking and Mobile Banking. In 2011, the contactless payments were introduced in the Czech Republic.

Phone banking belongs among the first systems of remote access communication with the bank. This system allows operation of banking services over the telephone with touch tone dialing, or the mobile phone. Phone banking uses either a computerized system where options are chosen by pressing numbers on the phone key pad and communication is based on the automated voice system. The second option of the phone banking is the communication with a telephone banker who provides the same services as the bank clerk at the counter. An authentication into the phone banking system is made by the identification number and the personal identification number (PIN). As the number of landline users falls, the popularity of the telephone banking declines. Many of the Czech banks still offer the services of telephone banking.

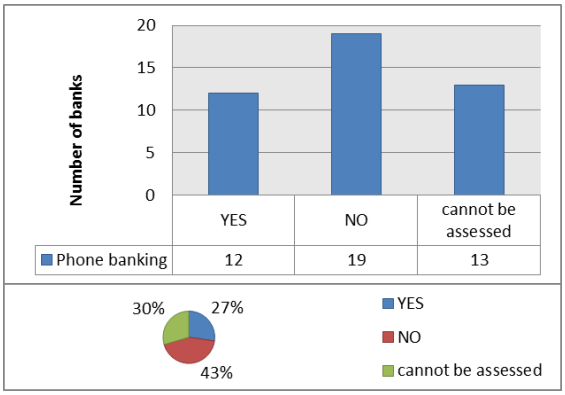

Fig. 7: Phone banking (any type) provided by banks in the Czech Republic
Source: own investigation among 44 Czech banks, status of February 17, 2012

The growing popularity of smart phones and other portable Web-enabled devices such as tablets has skyrocketed banking via mobile phones in recent years. There are several ways of mobile phone banking: SMS messaging, mobile web banking, GSM banking, JAVA banking, and applications developed for iPhone, Android or Blackberry devices – mobile internet banking.

SMS banking (SMS stands for short message service) is a technology-enabled service that allows customers to make simple actions to their bank accounts by sending and receiving text messages. The users of SMS banking need to register first, and verify their phone numbers with their banks. Some banks use an authentication calculator for the higher security. SMS messages must be sent in exactly defined format, for example texting "Bal" will obtain the account balance. [10]

GSM banking as the next mobile banking technology is based on the application built into the SIM card – SIM Toolkit (SIM stands for Subscriber Identity Module). SIM Toolkit provides encryption of SMS messages. GSM banking application creates an encrypted message that can be decrypted only by software of the bank. Misuse of this system is eliminated just because encrypting.

Mobile web banking or WAP banking (Wireless Application Protocol) is similar to online account access from a home-based computer. It is a combination of a phone and internet banking. This system allows various banking transactions simply by logging into the user's account via a mobile web browser. WAP banking though didn't achieve much success, because in comparison to other communication channels it is slow, costly and complicated technology. [11]

JAVA banking allows clients to control their accounts online in a quality that brings Internet banking. The access to the banking products is performed throughout a programming language Java. Communication between the client and the bank is based on the data transfer. In comparison to GSM Banking, the bank is not limited in the range of provided services that can be run via Java banking.

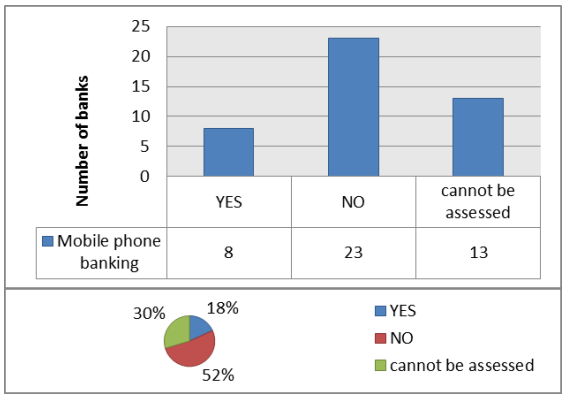

Fig. 8: Mobile phone banking provided by banks in the Czech Republic
Source: own investigation among 44 Czech banks, status of February 17, 2012

Home banking was most popular till the end of the last century, when it was fundamentally replaced by Internet banking. Home banking is used today primarily by corporate clients who take the advantage of these products, which is compatibility with other financial and economic software programs. Home banking allows contact with the bank via a special software program which allows almost all transactions with the current account without on-line connection to the Internet. An authentication is made by a certificate, using usually an encrypted SSL connection. The biggest disadvantage of home banking systems is that they can only be used on the computer where the special banking software is installed.

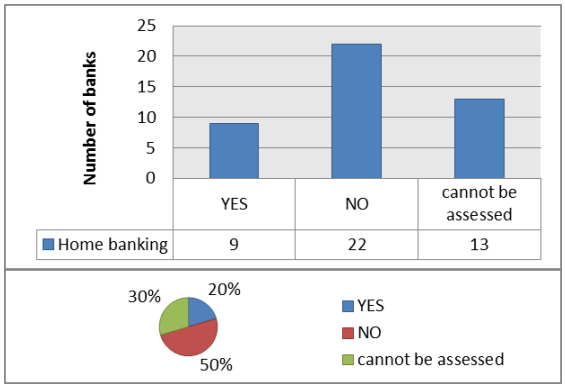

Fig. 4: Home banking provided by banks in the Czech Republic
Source: own investigation among 44 Czech banks, status of February 17, 2012[1]

Internet banking can eliminate above mentioned disadvantage, because this service allows communication with the bank from anywhere in the world and on any computer with the Internet connection. It is necessary to log on the bank's web page, enter a user name and certification code, and to carry out operations with the account. An authentication of Internet banking operations depends on the particular bank, but generally is used the username and password, a certificate, SMS authentication, or PIN calculator.

[1] The use of particular electronic banking service could not be assessed by building societies and the Czech Export Bank

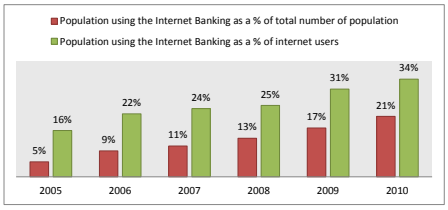

Fig. 5: Population using internet banking in the Czech Republic
Source: Czech Statistical Office [12], own elaboration

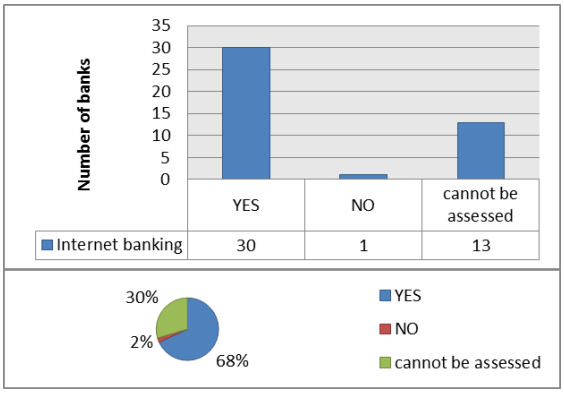

Fig. 6: Internet banking provided by banks in the Czech Republic
Source: own investigation among 44 Czech banks, status of February 17, 2012

Mobile Internet banking, also Smart banking is based on the mobile banking applications for Android, iPhone or Blackberry mobile phones ("smart" phones). These applications connect the user directly to the bank server for complete banking functionality without having to navigate a mobile web browser. Mobile Internet applications can be downloaded either through the bank's website or through the iTunes store, like Android Market. Smart banking applications offer also services which are not directly related to the banking and payments, like ATM or branch location, or information on various benefits and discounts in stores.

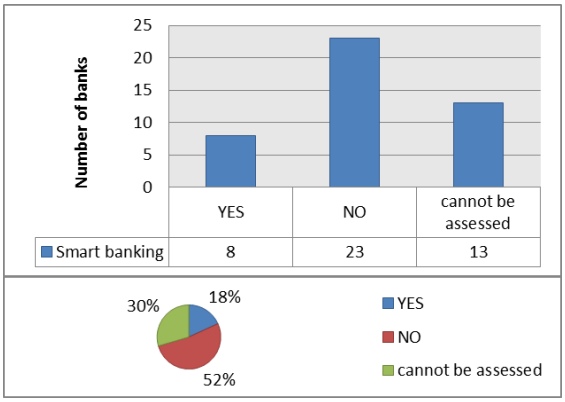

Fig. 9: Smart banking provided by banks in the Czech Republic
Source: own investigation among 44 Czech banks, status of February 17, 2012

Contactless payments are based on the technology of Near Field Communication. Contactless payments were first introduced in Great Britain in 2007, in the Czech Republic in 2011. Currently this is still relatively short period for massive expansion of this technology. According to own investigation, this service is

offered by two banks to date, but the other banks prepare enter to the market of contactless payments soon.

Time saving is seen as the biggest advantage of the contactless payments. While processing a cash transaction takes an average of 34 seconds, and a pin transaction 27 seconds, the contactless payments typically take only 12.5 seconds. [13] This is the reason why it is supposed that contactless payments will gradually replace the use of physical cash for small purchases. The contactless payments represent the challenge especially for merchants who haven't offered credit card payments yet (such as fast foods, tobacco shops, parking places, public transport etc.).

The trends in the Czech Republic concerning electronic banking can be monitored also in the table 1. The total number of current accounts of households has increased from 7.940 thousands in 2008 to 9.001 thousands in 2010. The number of current accounts with any type of electronic payment instrument (payment cards, Internet or Telephone banking) has also substantially increased, whereas the number of accounts without any electronic access has decreased. [14]

Tab. 1: Number of the current accounts of households in the CR

Current accounts of households (in thousands)	2008	2009	2010
Total amount of accounts	7.940	8.433	9.001
Current accounts with issued payment cards	5.771	5.984	6.199
Current accounts with access via the Internet	3.588	4.393	5.282
Current accounts with access via a telephone	3.247	3.658	4.072
Current accounts without any electronic access	1.097	1.046	974

Source: Czech National Bank [14], own elaboration

Shift from brick-to-mortar banking to the click-to-mortar banking

This part of the article deals with the hypothesis that the traditional brick-to-mortar banking is gradually replaced by the click-to-mortar banking, and that the cash transactions are replaced by cashless payments.

The costs of financial services provided through traditional financial channels (like branches, or landline telephones) seem to be higher than costs of modern financial services based on wireless Internet communication systems (like ATMs, PC banking, Internet banking applications). Claessens states that a typical customer transaction through a branch or phone call costs about 1$, but that transaction costs just $0.02 online (Figure 10). [1]

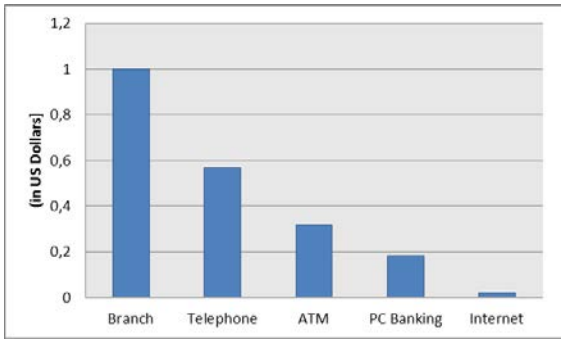

Fig. 10: The marginal cost of a standard financial transaction through different delivery channel
Source: Electronic Finance [1]

It is not just economies of scale in the production of financial services that prove the shift from brick-to-mortar banking to the click-to-mortar banking. The manners of the bank customers have also significantly changed. The bank clients got used to modern technologies that have simplified their ordinary private or corporate payments. Nevertheless it is not expected that the brick branches of the banks completely disappear. It is rather expected that the structure of services provided by stone bank branches will be modified, and more specialized consulting services from the financial sector will be offered.

In the Czech Republic, there can be found kind of synergy of the brick-to-mortar banking and the click-to-mortar banking. As evidenced in previous text, most of the Czech banks offer some kind of electronic channels or instruments. Even the new banks that as supposed to be pure virtual - based on internet and phone banking, and low transaction cost, build a network of physical financial advisors situated for example in shopping centers. The first virtual bank in the CR was introduced in 2007.

5 Future of the electronic banking

It is very difficult to predict the future of electronic banking. The next developments in electronic banking will probably involve new products and services that were not feasible in traditional banking models.

In some countries of the North and South America, Europe, and Asia, biometrics technology is already being used in banking industry. *Biometric technologies are automated methods of verifying or recognizing the identity of a living person based on a physiological or behavioral characteristic. Examples of physiological and behavioral characteristics currently used for automatic identification include fingerprints, voice, iris, retina, hand, face, handwriting, or finger shape.* [15] Biometrics in banking has a potential for use as a protection against both external and internal fraud.

Digitization and computerization in the financial institutions brings the challenge of paperless banking which is based on online account opening, maintenance, bill payment, etc. The goal is to prevent paper from entering any banking process. [16] Paperless banking technologies can generate savings for the bank and the customer, so they raise efficiency bank-wide. Environmental benefits are also significant.

One of the fastest-growing technologies in coming years is cloud computing. Cloud computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the data centers that provide those services Software as a Service (SaaS). [17] This trend is no more a dominant just of IT corporations, but more and more financial institutions invest in the cloud infrastructure. Banks must consider to a significantly greater extent issues concerning data confidentiality, security, regulatory compliance, and quality of services. Besides cost saving, which is one of the most important benefits of cloud banking, clouds can offer an unlimited capacity and flexibility to continuous development of innovative products, services and channels.

Conclusion

The Internet and other wireless communication technologies have changed the world around us, including banking services and payment channels. This paper was focuses on the dynamics of the electronic banking in the Czech Republic in recent years, on the trends of electronic banking, and assumptions of the future development of electronic finance.

The current expansion of electronic wireless technologies, together with the rapid growth of computer and Internet facilities of the Czech households, lead to massive expansion of electronic banking services. Most of the Czech banks offer one or more types of electronic banking products, which include particularly payment cards, e-payments and m-payments.

The transition from traditional brick-to-mortar banking to so called click-to-mortar banking is an indisputable global trend, but this trend should to be seen more like a direction than like a

destination. It can be stated that the cash transactions are gradually replaced by cashless payments.

The next developments in electronic banking will probably involve new products and services that were not feasible in traditional banking models. The future of electronic banking has no limits, banks just must consider to significantly greater extent issues concerning data confidentiality, security, regulatory compliance, and quality of services. The future of electronic banking will probably include paperless banking, biometrics technologies, and cloud technologies.

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ECONOMIC BASE OF OPOLSKIE VOIVODSHIP, 2008-2010

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Abstract: This paper reviews the literature and presents empirical results of survey of economic base in Opolskie Voivodship (Poland). To estimate the economic base of Opolskie Voivodship, the location quotient is used. This study uses data from the Central Statistics Office of Poland (CSO). The data by kinds of activity are presented in accordance with the Polish Classification of Activity (PKD 2007). The main purposes of the study are: (1) analysis of diversification and changes in employment in enterprise sector (especially in manufacturing), (2) identification of basic and non-basic sectors in Opolskie Voivodship in 2008-2010 period.

Keywords: economic base, employment, Opolskie Voivodship, Poland.

1 Introduction

Regions do not exist in isolation. Economic base concepts originated with the need to predict the effects of economic activity on regions. Regions are subject to ongoing flows of goods, ideas, people, products, and services. Therefore, any economic model that seeks to explain regional growth must take these flows into account in its explanation of the sources of growth. Economic base theory views regional economic growth as being driven by exogenous final demands.

Economic base analysis is simple tool that can be used to gain an understanding of the economic structure of regions. It can provide information on the economic status of regions across time periods with respect to employment conditions and trends. Economic base theorists assert that any local or regional economy may be disaggregated into a binary-dichotomous classification system: basic and non-basic. The basic sector is made up of those local businesses that produce goods and services sold to consumers outside the region. The basic sector refers to those industries and services that are largely dependent upon external markets. Basic sector is important driver of regional economic growth. The non-basic sector is composed of those businesses that produce goods and services sold and consumed in the region (Hildebrand and Mace, 1950; Dinc 2002; North, 1955; Polese and Verreault, 1989; Rupasingha and Patrick, 2009; Stabler, 1968; Thomas, 1964).

The aim of this study is to deepen understanding of the factors of at regional level. The main purposes of the study are: (1) analysis of diversification and changes in employment in enterprise sector (especially in manufacturing), (2) identification of basic and non-basic sectors in Opolskie Voivodship in 2008-2010 period. The paper provides detailed findings from the research, as well as methodology, data, and the literature. The data cover the period from 2008 to 2010. The reason for choosing 2008-2010 period were (1) differences in methodology of data collection in past years[1] and (2) availability of data at the time of the research. The given paper presents only some fragments of analysis – results of economic base analysis for the industries in Opolskie Voivodship.

Economic base analysis should use industry output and trade flows to and from the region. However due to data disclosure issues this is not possible for Opolskie Voivodship. The alternative is to use employment data. Another issue relates to the need for relatively high disaggregation (i.e. the sectoral breakdown must be sufficient) of the employment data. To estimate the economic base of Opolskie Voivodship, the location quotient (LQ) is used (North, 1955; Hildebrand and Mace, 1950; Dinc 2002). An location quotient is the ratio of regional employment in an industry to total regional employment to the ratio of employment in the national industry to total national employment. The location quotient, due to its simple, is widely used by regional development practitioners in economic impact analysis and regional comparisons.

The data by kinds of activity are presented in accordance with the Polish Classification of Activity (PKD 2007)[2]. This study uses data from the Central Statistics Office of Poland (CSO). The data are taken of the free on-line data base of CSO[3].

2 Literature revue

The chapter summarizes the literature of economic base. Emerging from international trade theory, economic base models have sought to explain a region's growth through the examination of its inflows and outflows. The economic base theory derives from the early works of Douglas North (1955) on regional economic growth. Under certain working hypotheses, the economic base theory allows to evaluate the level of employment which is induced directly and indirectly by the presence of a given economic activity (Failler 2003). North (1955) argues that regions resemble countries, exploiting their natural resource distributions and comparative advantages to produce goods with a lower opportunity cost. According to this model of economic development, all other economic activity within the region that is not directly tied to this export activity is supported by growth in these exporting industries. These ancillary industries are labeled "non-basic", producing locally-demanded consumer goods and services. The local businesses are assumed to be a consequence of a region's growth. They are not the source of it. The total employment of a local community is driven by the employment growth of "basic" industries.

From this original idea, economic base theory has undergone a series of changes. These revisions include measuring export flows out of a region by identifying the long-run value of its imports (Hoyt, 1961). In addition, other sources of growth have been identified beyond those originally included in traditional economic base models. Such factors as population size, new discoveries, depletions of natural resources, changes in technology and cultural traits, should also be considered because they change and influence a region's economic growth (Thomas, 1964; Stabler, 1968). Thomas points out that export base theory does not predict what will happen if an industry arises which is not dependent on the traditional "basic" industries for growth. These could include the new economy firms who are largely dependent on consumer demand and innovation for industry growth. Finally, economic base models have been created which try to explain how a region can base its exports on a trade of services, not goods (Polese and Verreault, 1989).

3 Data and methods

Data (average paid employment in enterprise sector by type of activity) are presented in accordance with the Polish Classification of Activities 2007 (PKD 2007). The data cover the period from 2008 to 2010.

The degree of regional specialization is most commonly determined by location quotient (LQ). An LQ is the ratio of regional employment in an industry to total regional employment to the ratio of employment in the national industry to total

[1] Previously, the classification of economic activity used Employment Survey was NACE REV. 1.1.. An updated classification (NACE Rev. 2) has been implemented in 2008. This publication provides an employment time-series for the period 2008-2010 based on NACE Rev. 2. classification. NACE consists of a hierarchical structure. The structure of NACE is described in the NACE Regulation as follows:
i. a first level consisting of headings identified by an alphabetical code (sections),
ii. a second level consisting of headings identified by a two-digit numerical code (divisions),
iii. a third level consisting of headings identified by a three-digit numerical code (groups),
iv. a fourth level consisting of headings identified by a four-digit numerical code (classes).

[2] Polish Classification of Activities 2007 (PKD 2007) was compiled on the basis of Statistical Classification of Economic Activities in the European Community – NACE Rev. 2. PKD 2007 was introduced on 1st January 2008 by the decree of Council of Ministers to replace the formerly applied PKD 2004.

[3] Avaiable at the following address http://www.stat.gov.pl.

national employment. The equation for a location quotient can be written:

$$LQ = \left(E_{ib}^t / E_b^t\right) / \left(E_{ir}^t / E_r^t\right)$$

E_r^t - total number of employment in the nation at period t

E_{ir}^t - number of employment, nationwide, in sector i at period t

E_{ib}^t - number of regional employment in an sector i at period t

LQ greater than 1 indicates a disproportionately large share of that industry being represented regionally, or that industry is said to have an export orientation. LQ less than 1 indicates that that particular industry is underrepresented relative to national level employment trends. An LQ equal 1 indicates perfect self-sufficiency (no imports, no exports). Location quotient technique has been widely used. Szewczyk, Tłuczak and Ruszczak used location quotients for cluster identifying in Opolskie Voivodship (Szewczyk et al. 2011).

Typically, a "location quotient" is used to distinguish between basic and non-basic industries . In order to get a more detailed and comprehensive picture of economic base in Opolskie Voivodship, location quotients are calculated for manufacturing sub-sectors.

4 Analysis and results

The first area of focus is the employment in Opolskie Voivodship (table 1). The employment in enterprise sector in Opolskie Voivodship has changed over the past 3 years. The number of employees was decreasing. In total, there are now less than 3.4 thousand people employed compared to 100 thousand three years previously (a 3.4 per cent decrease).

Table 1. Opolskie Voivodship: employment by selected enterprise sectors#, 2008-2010

Section - Name	2008	2009	2010	2008-2010
Grand total	100,078	98,488	96,636	-3,442
B - Mining and quarrying	954	960	957	3
C - Manufacturing	54,936	51,435	49,496	-5,440
E - Water supply; sewerage, waste management and remediation activities	2,507	2,534	2,599	92
F - Construction	7,117	7,840	8,125	1,008
G - Trade; repair of motor vehicles	13,668	14,065	14,508	840
H - Transportation and storage	5,930	6,399	6,306	376
I - Accommodation and catering	1,258	1,330	1,413	155
L - Real estate activities	1,593	1,564	1,508	-85
N - Administrative and support service activities	4,910	5,150	4,238	-672

- some of the data may not be published due to the necessity of maintaining statistical confidentiality in accordance with the Law on Public Statistics
Grand Total = A + B + C + D + E + F + G + H + I + J + K + L + M + N + O + P + O +R + S + T + U
Source: Central Statistical Office.

There have been several important changes in Opolskie Voivodship over recent years. The majority of these transitions may be accounted for by a declining employment in manufacturing and an ever-increasingly significant service sector. Data (table 1) shows the growing significance of construction and wholesale trade, as well as transportation, storage, accommodation and catering.

Employment data by sections is presented as a location quotient in table 2, which allows a comparison to be made of the relative concentrations in the employment base between the benchmark areas. Location quotients identify the relative industry's concentration of employment compared with the average for Poland . A score greater than one indicates a relative high concentration of employment, and a score less than one represents a relative scarcity of employment.

Table 2. Opolskie Voivodship: employment Location Quotient by selected enterprise sectors, 2008-2010

Section - Name	LQ 2008	LQ 2009	LQ 2010
B - Mining and quarrying	0.29	0.29	0.30
C - Manufacturing	1.36	1.37	1.37
E - Water supply; sewerage, waste management and remediation activities	1.39	1.37	1.39
F - Construction	0.93	0.97	1.02
G - Trade; repair of motor vehicles	0.69	0.70	0.74
H - Transportation and storage	0.69	0.75	0.76
I - Accommodation and catering	0.71	0.71	0.72
L - Real estate activities	0.95	0.95	0.91
N - Administrative and support service activities	1.00	1.05	0.79

Source: own calculations.

Significant sections with a stronger employment presence in Opolskie Voivodship are: manufacturing (LQ=1.37), and water supply, sewerage, waste management and remediation activities (LQ=1.39). In terms of growth, the construction increased the most during 2008-2010 in relative importance (tables 1-2). In employment terms, Opolskie Voivodship has three basic sectors: (1) manufacturing, (2) water supply, sewerage, waste management and remediation activities, and (3) construction.

Table 3. Economic base results for sections (2010)

Section - Name	Employment	LQ	Assumption
B - Mining and quarrying	957	0.30	Non-basic
C - Manufacturing	49,496	1.37	Basic
E - Water supply; sewerage, waste management and remediation activities	2,599	1.39	Basic
F - Construction	8,125	1.02	Basic
G - Trade; repair of motor vehicles	14,508	0.74	Non-basic
H - Transportation and storage	6,306	0.76	Non-basic
I - Accommodation and catering	1,413	0.72	Non-basic
L - Real estate activities	1,508	0.91	Non-basic
N - Administrative and support service activities	4,238	0.79	Non-basic

Source: own presentation.

Manufacturing remains a key sector for Opolskie Voivodship, in terms of its total presence in the local economy (table 1). The employment in manufacturing in Opolskie Voivodship has changed over the past 3 years. The number of employees was decreasing. In total, there were less than 5.4 thousand people employed in 2010 compared to 55 thousand three years previously (a 10 per cent decrease).

There are three large manufacturing sub-sectors, together accounting for about 40% of employment in Opole Voivodship. These are: manufacture of food products, manufacture of metal products, and manufacture of motor vehicles, trailers and semi-

trailersipment. Each of these sectors contributes over 10% of manufacturing employment (table 4).

Table 4. Opolskie Voivodship: employment in manufacturing (divisions - by two digit code), 2008-2010

Division - Name	2008	2009	2010	2008-2010
Section C - Manufacturing	54,936	51,435	49,496	-5,440
10 - Manufacture of food products	7,492	7,363	7,502	10
16 - Manufacture of products of wood, cork, straw and wicker	1,962	1,940	2,139	177
17 - Manufacture of paper and paper products	938	903	945	7
18 - Printing and reproduction of recorded media	402	484	464	62
20 - Manufacture of chemicals and chemical products	2,869	2,875	2,767	-102
22 - Manufacture of rubber and plastic products	1,522	1,362	1,660	138
23 - Manufacture of other non-metallic mineral products	3,672	3,508	3,555	-117
24 - Manufacture of basic metals	2,359	2,132	2,212	-147
25 - Manufacture of metal products	6,434	6,262	6,640	206
27 - Manufacture of electrical equipment	2,842	2,683	2,751	-91
28 - Manufacture of machinery and equipment n.e.c.	4,306	4,200	3,971	-335
29 - Manufacture of motor vehicles, trailers and semi-trailers	5,750	4,943	5,176	-574
31 - Manufacture of furniture	4,436	3,987	3,836	-600

Source: Central Statistical Office.

Significant divisions (the top-3 leading) with a stronger employment presence (measured as LQ) in Opolskie Voivodship are: manufacture of chemicals and chemical products (LQ=2.26), manufacture of motor vehicles, trailers and semi-trailers (LQ=2.06) and manufacture of basic metals (LQ=2.05). In terms of growth, the manufacture of products of wood, cork, straw and wicker division and the manufacture of machinery and equipment n.e.c. increased the most during 2008-2010 in relative importance (table 5).

Table 5. Opolskie Voivodship: location quotient results (divisions - by two digit code), 2008-2010

Division - Name	2008	2009	2010
Section C - Manufacturing	1.36	1.37	1.37
10 - Manufacture of food products	1.12	1.12	1.16
16 - Manufacture of products of wood, cork, straw and wicker	1.08	1.21	1.31
17 - Manufacture of paper and paper products	1.12	1.09	1.14
18 - Printing and reproduction of recorded media	0.80	0.97	0.92
20 - Manufacture of chemicals and chemical products	2.24	2.32	2.26
22 - Manufacture of rubber and plastic products	0.56	0.53	0.64
23 - Manufacture of other non-metallic mineral products	1.66	1.76	1.80
24 - Manufacture of basic metals	1.90	1.95	2.05
25 - Manufacture of metal products	1.65	1.66	1.77
27 - Manufacture of electrical equipment	1.63	1.67	1.76
28 - Manufacture of machinery and equipment n.e.c.	1.59	1.66	1.80
29 - Manufacture of motor vehicles, trailers and semi-trailers	1.97	1.97	2.06
31 - Manufacture of furniture	1.72	1.66	1.65

Source: own calculations.

In employment terms, Opolskie Voivodship has a big number of basic activities in manufacturing – 12 out of 14 divisions have LQ greater than 1 (table 6). Basic divisions are: manufacture of food products; manufacture of products of wood, cork, straw and wicker; manufacture of paper and paper products; manufacture of chemicals and chemical products; manufacture of other non-metallic mineral products; manufacture of basic metals; manufacture of metal products; manufacture of electrical equipment; manufacture of machinery and equipment n.e.c.; manufacture of motor vehicles, trailers and semi-trailers and manufacture of furniture. Non-basic divisions are: printing and reproduction of recorded media and manufacture of rubber and plastic products.

Table 3. Location quotient results for divisions (by two digit code)

Division - Name	Employment	LQ	Assumption
10 - Manufacture of food products	7,502	1.16	Basic
16 - Manufacture of products of wood, cork, straw and wicker	2,139	1.31	Basic
17 - Manufacture of paper and paper products	945	1.14	Basic
18 - Printing and reproduction of recorded media	464	0.92	Non-basic
20 - Manufacture of chemicals and chemical products	2,767	2.26	Basic
22 - Manufacture of rubber and plastic products	1,660	0.64	Non-basic
23 - Manufacture of other non-metallic mineral products	3,555	1.80	Basic
24 - Manufacture of basic metals	2,212	2.05	Basic
25 - Manufacture of metal products	6,640	1.77	Basic
27 - Manufacture of electrical equipment	2,751	1.76	Basic
28 - Manufacture of machinery and equipment n.e.c.	3,971	1.80	Basic
29 - Manufacture of motor vehicles, trailers and semi-trailers	5,176	2.06	Basic
31 - Manufacture of furniture	3,836	1.65	Basic

Source: own presentation.

5 Conclusions

With a transitioning economy, some emergent service sectors will take precedence over old manufacturing functions. Also, differential regional endowments, workforce skills, and historical-economic development trajectories tend to cumulatively determine regional specialization. The main purposes of the study were: (1) analysis of employment in

enterprise sector in Opolskie Voivodship (especially in manufacturing), (2) identification of basic and non-basic sectors in 2008-2010 period. To estimate the economic base of Opolskie Voivodship, the location quotient (LQ) was used.

There are the findings:

1. In relation to the year 2008 and 2009, in 2010 in Opole Voivodship, there was a slight change in sectors' composition. The majority of transitions in employment may be accounted for by a declining manufacturing base and an ever-increasingly significant service sector. Data shows the growing significance of construction and wholesale trade, as well as transportation, storage, accommodation and catering. In essence, manufacturing is in fact declining but the sector still remains strong relative to other local and regional sectors.
2. In employment terms, Opolskie Voivodship has three basic sectors: (1) manufacturing, (2) water supply, sewerage, waste management and remediation activities, and (3) construction.
3. Manufacturing remains a key sector for Opolskie Voivodship, in terms of its total presence in the local economy. In total, there were 50 thousand people employed in manufacturing in 2010.
4. The manufacture of food products, manufacture of metal products, and manufacture of motor vehicles, trailers and semi-trailersipment contributed 40% of employment of manufacturing in 2010 in Opole Voivodship. This ratio have remained relatively steady over the last three years.
5. Significant divisions (the top-3 leading) with a stronger employment presence (measured as LQ) in Opolskie Voivodship are: manufacture of chemicals and chemical products (LQ=2.26), manufacture of motor vehicles, trailers and semi-trailers (LQ=2.06) and manufacture of basic metals (LQ=2.05).
6. In employment terms, Opolskie Voivodship has a big number of basic activities in manufacturing – 12 out of 14 divisions have LQ greater than 1 (table 6). Basic divisions are: manufacture of food products; manufacture of products of wood, cork, straw and wicker; manufacture of paper and paper products; manufacture of chemicals and chemical products; manufacture of other non-metallic mineral products; manufacture of basic metals; manufacture of metal products; manufacture of electrical equipment; manufacture of machinery and equipment n.e.c.; manufacture of motor vehicles, trailers and semi-trailers and manufacture of furniture. Non-basic divisions are: printing and reproduction of recorded media and manufacture of rubber and plastic products.
7. It seems to be necessary to carry out a comparative research for the consecutive years.

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A COMPARISON OF VALUE PREFERENCES OF PSYCHOLOGY STUDENTS AND THE ONES OF STUDENTS OF OTHER DISCIPLINES IN THE CZECH REPUBLIC AND THE NETHERLANDS

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Abstract: The actual study used the Values Survey Module (VSM 08) to investigate how value preferences of Czech students differ from the ones of Dutch students. Secondly, the Schwartz Value Survey (SVS 57) was used to find out if there are any differences in value preferences between Czech and Dutch students and between students of psychology and students of other disciplines. Finally, all four of the groups based on all of the combinations of nationality and study fields were compared using the Schwartz value Survey. The results of the study revealed that Czech students and Dutch students had different value preferences, whereas psychology students and students of other subjects did not differ from each other. The research also demonstrated the differences among value preferences of all four groups.

Keywords: values, value preferences, cross-cultural comparison, Czech Republic, Netherlands, students

1 Introduction

Human values have been widely researched by many researchers (see Divisenko, 2010; Furnham, 1988; Grusec & Goodnow, 1994). Schwartz and Bilsky (1987) define values as main goals in one's life. There is a tight connection between these life goals and beliefs about how to reach them. Values are considered to be the basic guiding principles that influence people's behavior, thinking, and decision-making. Wenzel and Inglehart (2010) mention values in relation to human needs. Having such high impact on the ways we fulfill our needs, they help us to make decisions about what is important in our life. According to Rokeach (1968), values can be perceived as moral standards and criteria for selection of behavior.

Rokeach (1968) names three basic components of values: the behavioral, affective, and cognitive component. The behavioral component relates to motives and intentions, whereas the cognitive one represents thinking and decision making. Finally, one's relationship toward objects in the outside word is represented by the affective component (Rokeach & Regan, 1980).

The concept of 18 instrumental and 18 terminal values by Milton Rokeach (1973) belongs to the most influential value theories. Terminal values represent the final goals people follow in their lives, which can be equality, inner harmony, freedom, comfortable life, happiness, and other. On the other hand, values that guide our way toward the above mentioned life goals are called instrumental. They can be seen as means of reaching the terminal values. The examples are courageous, independent, obedient, loving, responsible and other.

Inglehart (2000) has been studying values in the relationship to social changes. Particularly, the process of transition from agrar to industrial society and later on to post/industrial society is of special interest to him. Inglehart (2006) argues that societal changes are followed by value changes that can be described on two dimensions. Traditional values are typical for agrar societies whereas secular-rational values are mostly seen in industrial societies. Traditional and secular-rational values are considered to be the opposing poles of the first dimension that was developed to describe value changes. The opposing poles of the second dimension are survival values and self/expression values. The changes that are nowadays happening in most well-developed societies can be best described on the second dimension. Furthermore, Inglehart (2000) makes a distinction between materialistic and post-materialistic values, and this further develops his theory of societal transition. Materialistic values (safety, stability, and other) are mostly held by people living in countries where the political situation is unstable and material resources are precious. Post-materialistic values (life satisfaction, freedom, and other) are typical for well-developed, stable, and wealthy countries. Furthermore, Inglehart (2008) concludes that value changes are more likely to happen in wealthy countries than in developing countries (in fact, the transition is much faster in these countries).

The theory of Schwartz (1994) is based on cross-cultural research of values and on studies that investigated the relations between values and variables such as gender, politics, and other. (see Schwartz, Caprara, & Vecchione, 2010; Schwartz, Rubel-Lifschitz, 2009; Barber & Eccles, 1992). According to Schwartz (1994), individual values can be organized into higher categories called motivational types of values; the values that belong to one category are defined by a common motivational goal. Schwartz describes 10 motivational types of individual values and 7 types of cultural values that are recognized in all cultures. However, the importance ascribed to each value differs from one country to another (Bilsky & Schwartz, 1994). Schwartz (1994) lists the following motivational types of individual values: power, achievement, hedonism, stimulation, self-direction, universalism benevolence, tradition, conformity, and security. It is important to mention that all 10 motivational types of values can be further localized on two dimensions. The opposing poles of the first one, conservation and openness to change, describe the conflict between the need for stability on the one hand and the need for independence on the other. Furthermore, self-transcendence and self-enhancement, the poles of the second dimension, describe the conflict between the need for domination and the need for cooperation (Davidov, Schmidt, & Schwartz, 2008). The motivational types of cultural values are: affective autonomy, intellectual autonomy, embeddedness, hierarchy, egalitarianism, mastery, and harmony. Furthermore, Schwartz (2006a) has developed three dimensions to describe the relationships between autonomy (both intellectual and affective) and embeddedness, hierarchy and equality, power and harmony.

2 Method

2.1 Purpose of the Study

The aim of the study was to compare the value preferences of these four target groups: Czech students of psychology (Palacky University), Czech students of other subjects, Dutch students of psychology (University of Groningen), Dutch students of other subjects. The hypotheses were set up as follows:

Hyp. 1: It is predicted that Czech students will differ from Dutch students in terms of cultural value preferences, as measured by the Values Survey Module 08 (VSM 08).
Hyp. 2**:** It is predicted that Czech students will differ from Dutch students in terms of cultural value preferences, as measured by the Schwartz Value Survey (SVS 57).
***Hyp.* 3:** It is predicted that Czech students will differ from Dutch students in terms of individual value preferences, as measured by SVS 57.
Hyp. 4**:** It is predicted that psychology students (both Czech and Dutch) will differ from students of other subjects in terms of individual value preferences, as measured by SVS 57.
Hyp. 5**:** It is predicted that, regarding the individual value preferences, the two-way analysis of variance (ANOVA) will show an interaction between nationality and field of study on the dimensions of SVS 57.

2.2 Participants

Both the VSM 08 and SVS 57 questionnaires had been filled out by 200 university students from the Netherlands (University of Groningen) and 200 students from the Czech Republic (Palacky University). Later, 11 Czech and 11 Dutch students were excluded (out of 400) because they had not met the inclusion criteria. These criteria had been set up as follows: being a full-time student enrolled in a bachelor or master's program at either

university; being born and having spent most lifetime in the Czech Republic or the Netherlands; both the participants and their parents being citizens of either country.

The final sample of 189 Dutch students included 155 women and 34 men. The age range of the Dutch sample was 20 to 28 years with the average of 21.96 years. 93 participants studied psychology and 96 participants were students of other subjects. The 96 participants attended the following faculties: Faculty of Economics and Business 14 %, Faculty of Social and Behavioral Sciences 11 %, Faculty of Theology and Religious Studies 3 %, Faculty of Arts 29 %, Faculty of Medicine 10 %, Faculty of Geography 10 %, Faculty of Law 11 %, Faculty of Philosophy 2 %, Faculty of Natural Sciences and Mathematics 10 %.

The final sample of 189 Czech students consisted of 94 students of psychology and 95 participants with other specialization. The other 94 participants were students at these faculties: Philosophical Faculty 32 %, Faculty of Natural Sciences 18 %, Theological Faculty 4 %, Faculty of Education 25 %, Faculty of Medicine and Dentistry 4 %, Faculty of Law 8 %, Faculty of Health Sciences 4 %, Faculty of Physical Culture 5 %. The average age of all Czech students was 22.6 years with the rage between 20 and 27. The sample included 31 men and 158 women.

After the exclusion of 22 participants (together with the questionnaires they had filled out), further 6 pieces of SVS 57 and 7 pieces of VSM 08 were discarded because they had been incomplete or filled out incorrectly.

2.3 Recruitment Procedure

The questionnaires were collected in the course of the academic year 2010/2011. All students of psychology were approached in the class. The students of other subjects were contacted on an individual basis at the university campus, in the library, and in the dormitories. Each person filled out both the SVS 57 and VSM 08 questionnaires, either in Czech or Dutch. All students were informed about the purposes of the study, the confidentiality and anonymity issues, and about the possibility to quit the study any time they wish.

2.4 Instrumentation

400 university students filled out the Values Survey Module 08 (VSM 08) and the Schwartz Value Survey (SVS 57). The Values Survey Module is a research tool designed for cross-cultural value comparisons between countries. The following dimensions are used to describe the differences: Small/Large Power Distance, Collectivism/Individualism, Femininity/Masculinity, Weak/Strong Uncertainty Avoidance, Short/Long Term Orientation, Indulgence/Restraint, Monumentalism/Self-Effacement (Hofstede, Hofstede, Minkov & Vinken, 2008). The VSM 08 consists of 28 content questions that can be answered on a five point scale (1-2-3-4-5). A certain number is there to express the degree of agreement with the statement. The scores for every single dimension are to be computed based on a formula that works with the mean scores for national samples of respondents. In the original questionnaire, there is a section with questions asking for demographic information. In the present study, this section had been taken out and was replaced by a list of demographic questions that had been created only for the purposes of the current study.

The Schwartz Value Survey was developed by Shalom Schwartz, and it comes from his theory of cultural and individual values (see Introduction). The survey contains a list of 57 values that are followed by a short description. The importance of each of the values is assessed by the ascription of one number from the scale ranging from -1 to 7.

2.5 Demographic Information Sheet

The demographic information sheet asked the participants to provide information from the following areas: information about themselves (gender, age, nationality, place of birth), educational background (university, year of study, field and level of study, education prior to entering the university), family background (nationality of the parents, their level of education, one-parent/two-parent family, number of siblings) and work experience (type of work, full/part-time, length of employment).

3 Results

3.1 Data Analysis

The data had been entered into SPSS for Windows, Release Version 11.0, (© SPSS, Inc., 2001, Chicago, IL, www.spss.com). Means and standard deviations were calculated for all interval level variables. The Shapiro-Wilk tests were conducted to test for normality of distribution. As for VSM 08, the instructions for data analysis and computation given by Hofstede, Hofstede, Minkov and Vinken (2008) were followed. In terms of the SVS 57, corrections for scale use described by Schwartz (2006b) had been performed. Finally, the t-tests and the two-way analysis of variance (ANOVA) were applied. The value of .05 was set for alpha.

3.2 Hypothesis 1

An independent-sample t-test had been conducted to compare the average scores of all Czech and all Dutch students on each dimension of the VSM 08. Four dimensions comparisons were significant. On the Small/Large Power Distance dimension, the group of Czech students (M = - 4.17, SD = 51.0) scored significantly lower, $t(3.57) = -2.33$, $p = .020$, than the group of Dutch students (M = 7.14, SD = 42.1). Leven´s test indicated unequal variances ($F = 6.33$, $p = .012$), so the degrees of freedom were adjusted from 369 to 3.57. On the Collectivism/Individualism dimension, Czech students (M = 40.3, SD = 55.7) scored closer to the pole called Collectivism, $t(369) = -2.20$, $p = .029$, then did Dutch students (M = 54.1, SD = 65.3). In terms of the Weak/Strong Uncertainty Avoidance, the results suggest that Czech students (M = -74.7, SD = 55.9), showed weaker uncertainty avoidance, $t(369) = -2.11$, $p = .036$, than did Dutch students (M = -62.0, SD = 60.1). Regarding the Monumentalism/Self-Effacement dimension, Czech students (M = 4.11, SD = 53.6) scored closer to the pole called Self-Effacement, $t(369) = 2.87$, $p = .004$, than did Dutch students (M = -11.0, SD = 47.6). As for the other three dimensions, the independent-sample t-tests failed to reveal any significant difference in scores between the two groups.

3.3 Hypothesis 2

An independent-sample t-test had been employed to compare the average scores of all Czech and all Dutch students on seven dimensions of cultural values by Schwartz. Significant differences between both groups were found on five dimensions. As for Embeddedness, the group of Czech students (M = 3.62, SD = .86) scored higher, $t(358) = 2.53$, $p = .012$, than the group of Dutch students (M = 3.41, SD = .75). On the Hierarchy scale, Czech students (M = 2.50, SD = 1.14) reached a higher score, $t(368) = 3.00$, $p = .003$, than did Dutch students (M = 2.16, SD = 1.03). Regarding the Affective Autonomy dimension, the score of Czech students (M = 4.00, SD = .99) was lower, $t(358) = -4.59$, $p < .001$, than the score of Dutch students (M = 4.49, SD = 1.06). In terms of the Intellectual Autonomy, students from the Czech Republic (M = 4.52, SD = .93) reached a lower score, $t(361) = -2.99$ $p = .003$, than did students from the Netherlands (M = 4.81, SD = .95). Finally, the Czech group (M = 4.72, SD = .83) scored lower on the Egalitarianism scale, $t(361) = -4.64$, $p < .001$, than the Dutch group (M = 5.11, SD = .79). On the remaining two dimensions, there were no statistically reliable differences between the groups.

3.4 Hypothesis 3

All dimensions of individual values had been subjected to a two-way analysis of variance with two independent variables: nationality (Czech vs. Dutch) and field of study (Psychology vs. other fields of study). All dependent variables were normally distributed for the groups formed by the combination of nationality and field of study, as assessed by the Shapiro-Wilk test. There was homogeneity of variance between groups as assessed by the Leven´s test for equality of error variances.

The results indicate that there was a significant difference between the scores of all Czech and all Dutch students on the dimensions called Universalism, Hedonism, and Power. As for Universalism, the main effect of nationality yeled an F ratio of $F(1, 365) = 5.77$, $p = .017$, such as that Czech students ($M = 4.14$, $SD = .93$) scored lower than Dutch students ($M = 4.38$, $SD = .97$). Similarly, on the Hedonism dimension, the main effect of nationality yeled an F ratio of $F(1, 357) = 44.4$, $p < .001$, suggesting that the Czech group ($M = 4.10$, $SD = 1.01$) reached a lower score on the dimension called Hedonism than the Dutch group ($M = 4.84$, $SD = 1.11$). Further, on the Power dimension, the main effect of nationality yeled an F ratio of $F(1, 365) = 43.8$, $p < .001$, indicating that students from the Czech Republic ($M = 2.85$, $SD = 1.22$) scored higher then students from the Netherlands ($M = 2.05$, $SD = 1.10$). On the remaining dimensions, however, the two-way ANOVA failed to reveal any significant differences in scores between the two groups.

3.5 Hypothesis 4

On all 10 dimensions, the two-way ANOVA failed to reveal significant difference in scores between all students of psychology (both Czech and Dutch) and all students of other subjects.

3.6 Hypothesis 5

As for the Conformity dimension, there was a significant interaction between nationality and field of study, $F(1, 366) = 6.30$, $p = .012$. Czech students of psychology ($M = 3.81$, $SD = 1.17$) reached a lower score, $F(1, 366) = 4.10$, $p = .044$ than Czech students of other subjects ($M = 4.13$, $SD = 1.08$), as indicated by the analysis of simple main effects. The two groups of Dutch students did not differ on this dimension, $F(1, 366) = 2.33$, $p = .13$. On the Benevolence dimension, there was a significant interaction between nationality and field of study, $F(1, 361) = 4.32$, $p = .038$. Dutch students of psychology ($M = 5.15$, $SD = 82$) reached a significantly higher score, $F(1, 361) = 7.40$, $p = .007$, than Dutch students of other subjects ($M = 4.82$, $SD = .82$). There was no difference between Czech students of psychology and other subjects, $F(1, 361) = .056$, $p = .81$. Furthermore, Czech psychology students ($M = 4.82$, $SD = .76$) reached a significantly lower score, $F(1, 361) = 7.30$, $p = .007$, than Dutch psychology students ($M = 5.15$, $SD = .82$). Students of other subjects from the Czech republic and from the Netherlands did not differ on this scale, $F(1, 361) = .065$, $p = .80$.

4 Discussion

We accept the first hypothesis saying that Czech students differed from Dutch students in terms of cultural value preferences measured by VSM 08. The fact that the Czech group scored closer to the Collectivism pole probably indicates that Czech students, more than Dutch students, emphasize values such as conformity and loyalty towards one's group. In other words, the values of their in-group play an important role in their lives. There is a great emphasis on norms and group membership which may become an important source of personal identity. In a university setting, it might be difficult for students with such value preferences to stand out and express their opinion or get involved in discussions.

The fact that Czech students showed weaker uncertainty avoidance than Dutch students is one of the most striking findings in the study. In real life, such tendencies can be seen as higher level of open-mindedness, tolerance and acceptance of diversity in the society. Having in mind that it is the Dutch society (not Czech) that is well known for its liberal attitude toward ethnic diversity, sexual minorities, and immigrants, we argue that this is the most interesting finding in the whole study.

The low score on the Small/Large Power Distance dimension suggests that Czech students show greater tendency to value social equality, and they attempt to avoid strict hierarchy together with unequal distribution of power in the society.

Another finding is that all Czech students scored closer to Self-Effacement, which can be connected to tendencies toward humility and flexibility.

The comparison of values on the national level by Hofstede and Hofstede (2006) had brought slightly different results. For instance, Hofstede and Hofstede had found that the Czech population scored higher on the Small/Lange Power Distance dimension than the Dutch population. Also, on the Weak/Strong Uncertainty Avoidance, the Czech sample scored higher than the Dutch sample. On the other hand, regarding the Collectivism/Individualism dimension, the results of the present study were consistent with the one's by Hofstede and Hofstede. They had also found differences between the two samples on the Femininity/Masculinity dimension where the current study did not reveal any significant differences. According to them, the Czech sample scored higher than the Dutch sample.

Next, we accept the second hypothesis saying that Czech students did differ from Dutch students in terms of cultural value preferences measured by SVS 57. The fact that they reached a higher score on the Embeddedness dimension can be interpreted as greater preferences for values such as respect, obedience, forgivingness, and politeness, when compared to Dutch students. On the dimensions called Intellectual Autonomy, Affective Autonomy and, Egalitarianism, the group of Czech students scored lower than Dutch students. In the case of Intellectual Autonomy, the results can be interpreted as lower emphasis on values some of which are freedom, curiosity, broadmindedness, and creativity. Regarding Egalitarianism, the lower score can suggest that values such as equality, social justice, loyalty and honesty are of less importance for Czech students. Finally, lower score on the Affective Autonomy dimension may be linked to lower preferences for pleasure, excitement in one's life, self-indulgence, and enjoyment.

For the above mentioned dimensions, the results of the present study are consistent with the findings of Schwartz (2006b) who had compared national samples from the Czech Republic and the Netherlands. However, the findings also suggest that there were differences between both groups on the Harmony and Mastery dimensions. The present study failed to reveal any significant differences on these dimensions.

We accept the third hypothesis saying that Czech students differed from Dutch students in terms of individual value preferences on the dimensions of SVS 57. According to the higher score on the Power dimension, it is likely that Czech students value authority, wealth, social power and recognition more than Dutch students. On the contrary, lower score on Universalism can be linked to lower preferences for values including wisdom, equality, inner harmony and broad mindedness. The fact that the Czech group scored lower on Hedonism may have the meaning that Czech students emphasize values such as pleasure and enjoyment less then Dutch students.

Further, we reject the fourth hypothesis saying that psychology students (both Czech and Dutch) differ from students of other subjects in terms of individual value preferences, as measured by SVS 57.

We accept the fifth hypothesis saying that regarding the individual value preferences, the two-way analysis of variance (ANOVA) shows an interaction between nationality and field of

study on the dimensions of SVS 57. The fact that the Czech students of psychology reached a lower score on the Conformity dimension may indicate that values such as obedience, politeness, and self-discipline are of less importance for them, when compared to Czech students of other subjects. Furth, Czech students of psychology reached a lower score than the Dutch psychology students on the Benevolence dimension. This may mean that they value loyalty, honesty, helpfulness and similar values less than Dutch psychology students. Finally, Dutch students of psychology scored higher on the Benevolence dimension than Dutch students of other subjects which may be linked to higher preferences for the above mentioned values.

Next, a number of limitations need to be considered. First, we would like explain that the results of the present study are not to be generalized to the Czech or Dutch population as a whole. The study worked with a very specific sample which only consisted of students who had been recruited from two universities, whereas other studies worked with the whole population. Second, the percentage of women in the sample was greater than men (see the Sample section for details). In fact, the gender distribution in our sample corresponds with the usual ratio of men to women in psychology classes. In other words, at both universities where the sample was recruited, there were more women than men among the students of psychology. Third, as for the other group (students of other subjects than psychology), the sample was slightly unbalanced in terms of study fields (see Participants section for details). The characteristics of the sample discussed above may bring some light into why we have got these results.

We also argue that the questionnaires themselves might have been the source of confusion. For instance, the SVS 57 contains a list of values, each of which is followed by a short explanation. It might be the case that some explanations are inaccurate, and the students might have failed to understand them correctly. As an example, there is the following explanation for the term “daring”: seeking adventure, risks. We argue that this is not the only way to understand this term. In may also be understood as moral courage. As for VSM 08, our main concern is that the majority of questions are related to work. Although most students indicated in the Demographic Data Sheet that they had already had carried out some jobs (summer jobs, internships, part-time jobs), professional work experience may have some impact on the validity and accuracy of their answer.

As mentioned above, gender may be an important factor to influence one´s value preferences. Previous research also supports the idea that women and men differ in terms of value preferences (Ryker & Others, 1992; Ryckman & Houston, 2003). According to Ryckman and Houston, who had also used the SVS 57, values such as Benevolence, Universalism, Safety and Success played a more important role for women than for men. On the remaining dimensions, however, men did not differ from women. In future research, gender can be included as third variable (besides filed of study and nationality). An interesting question would be whether results similar to Ryckman and Houston´s will be found among students. In future investigations, it might be possible to focus solely on psychology students. We consider this to be an important topic for research. We argue that the value preferences of psychology students, who are in fact prospective psychologists or psychotherapists, may have an impact on the process of therapy. Besides this topic, future investigation can focus, for instance, on differences between female and male psychology students. At many universities, male psychology students are rare. The work of a psychologist is considered to be a job that is typical for women. Researching the values of this group can bring more light into who really are these male students who had entered the university in order to study psychology. Further, at many universities, students can choose their further specialization since the master´s level. Specializations such as neuropsychology, clinical, educational and counseling psychology are very common. Research can also address the question of how the students who had chosen a certain specialization differ from the group that had chosen another filed. In other words, which values are important for future specialist in clinical psychology, neuroscience, and other fields when compared with each other. Another question to be discussed is whether studying psychology has an influence on one´s value preferences. Future research can be done to investigate whether there are any differences between first year and last year students.

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Primary Paper Section: A

Secondary Paper Section: D, G, L

INNOVATIVE APPROACHES TO EDUCATIONAL PROCESS

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The paper is published within the frame of the grant UGA Nr. IV/19/2012 entitled "Neurodidaktické princípy a ich vplyv na inovácie vo vyučovaní", as well as KEGA project Nr. 003UKF-4/2012 entitled "Edukácia akcentujúca docenenie mozgu."

Abstract: Innovations appearing in educational practice also in Slovakia are represented by several terms such as neurodidactics, neuropedagogy, brain-compatible learning, and brain-based learning. It is a field that respects multidisciplinary approach. Neuroscience is a basis for this innovative point of view that is focusing not just on brain processes happening during learning, but also on lesson planning respecting and developing pupils' individuality.

Keywords: innovations, neuroscience, brain-based learning, brain, fundamental principles of the learning process

1 Neuroscience as a basis for innovations

N*euroscience* identifies the subject matter of the investigation rather than the scientist training. A neuroscientist may be a biologist, psychologist, anatomist, neurologist, chemist, psychologist, or psychiatrist – even a computer scientist or a philosopher (Garrett, B., 2009). Briefly, neuroscience is a multidisciplinary study of the nervous system and its role in behavior. B. Garrett (2009) further mentions that a psychologist who works in the area of neuroscience specializes in biological psychology, or biopsychology, i.e., the branch of psychology that studies the relationship between behavior and the body, particularly the brain (sometimes the term psychobiology or physiological psychology is used).

To find out where neuroscience and the classroom link up, it is necessary to explore these areas in separately. Every pupil in a classroom comes to school with a brain customized by life experiences. Pupil's life experiences have a huge effect on their learning. Their neural history is not just the grades and test scores. A seemingly trivial accident, such as a bump on the head at a summer camp, could create a brain insult in the anterior ventral temporal lobe, an area responsible for certain types of semantic memory. This means that although a pupil's memory may be good for common names and places, it is poor for proper names and places. This type of memory functioning is common, yet it puzzles teachers who think that a pupil is simply not trying hard enough. After all, if pupils can learn and recall some types of words, why cannot they do that with all of them? The brain's unique history is the answer.

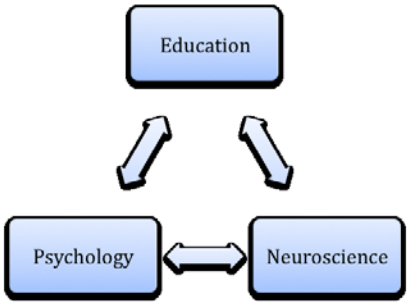

Figure 1 The Flow of Information in MBE Science. (In: Tokuhama-Espinosa, T., 2010)

The increasing interest in the learning brain is reflected by recent publications that focus on the connection between brain development and learning (Blackmore, S. J. - Frith, U., 2005; Hüther, G., 2002; Ratey, J. J., 2001; Spitzer, M., 2002, 2006; Stern, E., 2005; Stern, E., et al., 2005).

In 1988 G. Preiss, professor of didactics at the University of Fribourg, a specialist in early childhood mathematics education for youngest between two and a half and seven years, has pioneered programs that combined neurological research with math education and are based on a holistic approach to education. He propounded the introduction of an autonomous subject based on brain research and pedagogy that he called neurodidactics. According to this new discipline, school pedagogy and general didactics must attach more importance to the fact that learning lies in brain processes and that cognitive results keep up with the development of a child's brain. By taking this into account, one may say that neurodidactics studies the conditions under which human learning can be optimized to its highest level.

Neurodidactics is an interface between neuroscience, didactics, pedagogy and psychology. It tries to work out principles and proposals for effective learning based on the findings of brain research.

A new branch of education theory appeared that attempts to relate teaching strategies and learning modalities to the hard facts of brain research. This new learning theory called "neurodidactics" or "neuropedagogy" referring to brain-based learning came under debate in Europe recently (Caspary, R., 2006; Herrmann, U., 2006; Preiss, G., 1998; Spitzer, M., 2006).

Term related with neuroscience and neurodidactics is *brain-based education.* We can find various answers on frequently asked question "What exactly is brain-based learning"? N. Call (2010) says that „brain-based learning is a term used to describe how to apply theories about the brain to help children to maximize their potential for learning". She further writes that if you once understand the theory behind brain-based learning, then you can put its various aspects into practice and enhance the learning of the children - pupils in the classroom.

It is important to know method of working that derives from an understanding of the current research into how the brain develops.

Brain-based education is, according to E. Jensen (2008), best understood in three words: *engagement, strategies,* and *principles.* Brain-based education is the engagement of strategies based on principles derived from an understanding of the brain. It is not based on strategies given to us from neuroscientists. That is not appropriate. He further states that brain-based learning in accordance with the way the brain is naturally designed to learn. It is a multidisciplinary approach that is built on this fundamental question: What is good for the brain? It crosses and draws from multiple disciplines, such as chemistry, neurology, psychology, sociology, genetics, biology, and computational neurobiology. It is also a way of thinking about learning. It is a way of thinking about teacher's work. It is not a discipline on its own, nor is it a prescribed format or dogma. In fact, a "formula" for it would be in direct opposition to the principles of brain-based learning.

Although a brain-based approach does not provide a recipe for us to follow, it does encourage us to consider the nature of the brain in our decision making. By using what we know about the brain, we can make better decisions and reach more learners, more often, and with fever misses. Quite simply, it is learning with the brain in mind.

2 Brain of pupils and the learning process as a basis for innovations

Brain-based education considers how the brain learns best. The brain does not learn on demand by a school's rigid, inflexible schedule. It has its own rhythms. If we want to maximize learning, we first need to discover how nature's engine runs. This singular realization alone has fueled a massive and urgent

movement worldwide to redesign learning. What we thought was critical in the past may, in fact, not be very important at all.

As M. L. Slavkin (2004) says, brain is "not only the control center of the entire human body, organizing our behaviors and biological functions, but it also is the seat of our humanity. It defines who we are, how we act, and the very nature of our species."

To understand behavior and pupil's activity at school, we must understand how the brain works. And to understand how the brain works, we must first have at least a basic understanding of the cells that carry messages back and forth in the brain and throughout the rest of the body.

The basic and short anatomy of the brain is taken from publication of N. Call (2010). At the micro level, the human brain consists of about one hundred billion nerve cells, called *neurons*. These neurons can be thought of as very simple data processors, which work together to solve a particular problem as it is presented to the brain. The human brain is able to easily perform tasks that the largest, most expensive computers today find impossible to accomplish. Neurons develop *axons* for transmitting information to other neurons and *dendrites* for receiving information. As patterns of thought are first initiated and subsequently repeated, the participating neurons continually process and communicate. In doing so, they build stronger and more direct axon-to-dendrite pathways – called *synapses* – to other neurons. In other words, with repeated stimulation, these connections become even stronger and more established, and the brain has in effect "learned" how to solve that particular problem. At this point, the brain is ready to undertake further learning. Interestingly, those neurons that do not generate synapses quite literally die off.

At the macro level, the brain can be thought of in three parts: *brain stem*, the *limbic system* and the *cerebral cortex*. These parts of the brain are divided again into specific areas, each with an individual and complex role to play. Some areas process information gleaned from the senses, while others process different aspects of our emotional responses. Some are responsible for laying down certain types of memory, while others help us to "read" cues from other people and make appropriate emotional and physical responses.

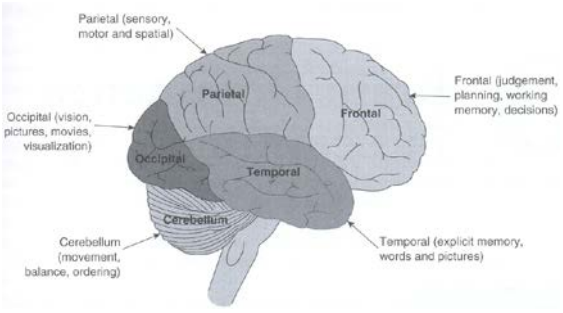

Figure 2 Lobes of the human brain. (In Jensen, E., 2008)

As we become more informed about the functioning and capability of the human brain, we can become increasingly effective in helping our pupils to learn. Scientists are helping to inform our school practice more now than ever before.

3 Fundamental principles of brain-based learning

The most important change for education is to understand how human beings learn and place that understanding at the very center of teaching. To make sense of the vast amount of research that has been generated in fields ranging from psychology to biology and neuroscience, the Caines (Caine, R. N., - Caine, G., 2009) developed a set of 12 Brain/Mind Learning Principles (Figure 2) that summarize what we presently know about learning. The principles were based on a view of human beings as living systems. Each principle had to meet four basic criteria:

1. The phenomena described by a principle should be universal. A brain/mind learning principle must therefore be true for all human beings, despite individual genetic variations, unique experiences, and developmental differences.

2. Research documenting any one specific principle should be evidenced in, and its influence must span more than, one field or discipline. Since a learning principle describes a system property, one would expect it to withstand validation and confirmation by triangulation of research that crosses multiple fields and disciplines.

3. The principle should anticipate future research. It should be expected and anticipated that research will continue to emerge that refines and confirms each brain/mind learning principle. For example, much of the brain research on the links between emotion and cognition was published after the first formulated principles in 1990. One example is the discovery of mirror neurons. Thus, a principle is a continuous work in progress, in the sense that new perspectives and ongoing research are constantly shaping and advancing our understanding of it.

4. The principle should provide implications for practice. By their nature, principles are general so they cannot be expected to tell educators precisely what to do. However, effective learning principles ought to provide, as a minimum, the basis for an effective general framework to guide decisions about teaching and help in the identification and selection of appropriate methods and strategies. Principles illuminate new sparks of *capacities for learning* which can be translated into further enhancements of instructional practices.

These principles were originally spelled out in the book *Making Connections: Teaching and the Human Brain* (Caine, R. N., - Caine, G., 1994). The principles look at all learners as living systems where physical and mental functioning are interconnected (learning is "psychophysiological"). As a result, *no principle is more important than another one. They are numbered for identification purposes only.*

Figure 2 12 Brain/Mind Learning Principles in Action. (In Caine, R. N. et al., 2009)

The principles help us understand why it has been so difficult to agree on what it means to learn. They show that several different processes are involved. The key to effective educational renewal is to integrate those different aspects of learning into the way we teach:

· For some, the primary aspect of learning is memorization, and the brain/mind is designed (in part) for memorization.

· For some, the primary aspect of learning is intellectual understanding, and the brain/mind is designed (in part) for intellectual understanding.

· For some, the primary aspect of learning is making intellectual and practical sense of experience, and the brain/mind is designed (in large measure) for making sense of experience.

· As more aspects of the principles are understood and implemented, the range of what is meant by pupil learning expands.

Three interactive elements emerging out of the principles are:

1. Relaxed alertness.

2. Orchestrated immersion in complex experience.

3. Active processing.

All of the principles and capacities suggest that there are three fundamental components or great teaching mentioned above. They are the foundation for professional development and must be mastered by teachers and understood by all educators. Authors address each principle separately, but it is critical to understand that each of these elements has a profound effect on the other two and is, in fact, never separate.

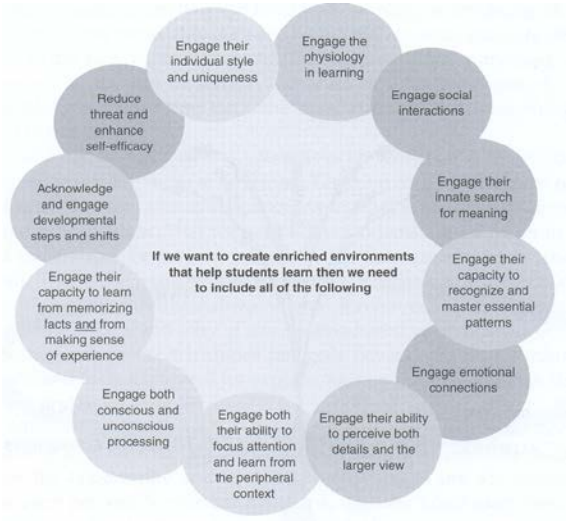

Figure 3 Learning capacities. (In Caine, R. N. et al., 2009)

How do educators implement fundamental principles of brain-based learning? To begin with, the principles tell us that every learner has immense and specific capacities for learning that teachers can and must address. In essence, learning based on biology is natural. Brain/mind learning capacities create enriched environment for learning. According to these principles, all learning engages the following (Figure 3). Our task is to orchestrate learning so that as many aspects of learning are engaged as possible.

4 Conclusion

It is important to know that humans learn in many ways, including sensitization, habituation, conditioned responses, semantic learning, imitation, and by doing. Many of these processes are not well understood. And although they may share parts of a pathway, we are each unique, and the different input is processed differently.

The center of the creative and humanistic style of teaching is a pupil, and it requires a creative teacher in particular. It means that a teacher that is not afraid of verify new teaching procedures, knows how to work flexible with curricula and textbooks, but also supports new projects and avoid the routine work in the classroom.

Brain-based learning is trying to implement the principles on the neuroscientific base and support creativity, use variable teaching methods, long-term memory strengthening, create enriched environment as well as relaxation and coping strategies.

Learning involves changes in strength synapses, the connections between neurons in the gray matter. Based on the findings of brain research, the brain-based teaching provides principles and proposals for effective teaching and learning. The main goal of these principles is to intervene in pedagogical practice. Not all of them are brand new, but they confirm the theories and principles of progressive pedagogy and prove that they are effective. Therefore, an integration of brain-based learning in the teacher training would be desirable.

Each pupil brings a unique personal neural history to school every day that gives teachers quite a challenge as they try to customize learning for each pupil. This uniqueness makes a strong case for legitimacy of different learning styles, a variety of learning strategies, multiple intelligences, and the role of appropriate choice. So while the history of a pupil (and his or her brain) does influence learning, it does not determine the learning. Even in the moment, it is how a pupil feels about the learning that plays as big part as anything. When pupils feel safe, exploratory, challenged, supported, and confident, miracles often happen. These miracles are the result of the triumph of environment over genetic makeup in the pupil`s brains. Scientists now know that our genes are susceptible to environmental input.
We live in a time in which a "revolution" in education is occurring. Through brain research and technology, we have unlocked many of the reasons why some children experience so much difficulty in learning. We know more about effective teaching practices than at any other time in history. Through technological advances, we have a whole world as our resource base. In addition, teachers are finally being empowered to make to choices that affect their classrooms.

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Primary Paper Section: A

Secondary Paper Section: AM, AN, FH

BYZANTINE EMPIRE AND ITS INFLUENCE ON THE EDUCATIONAL STRUCTURE IN GREAT MORAVIA

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This article originated as a part of the Specific university research project 2011 – 263402 Education and learning.

Abstract: This article deals with the analysis of school systems on the territory of the Byzantine Empire in the 9th century. It determines the cultural and historic environment out of which the mission sent by the emperor Michael III came. This act brought not only Christianity to our territory but also the concept of education as well. Yet it was not possible to apply all the components directly as the Slavonic countries were under the influence of the western culture. This text analyzes where the educational centres were established in Byzantium and their possible places on the territory of Rastislav's realm.

Keywords: Great Moravia, Byzantium, Cyril, Methodius, education

1 Preface

In the second half of the 9th century the ruler of Great Moravia wants to curtail the activities of the Frankish missionaries in his realm. On one hand, they conduct all liturgical ceremonies but on the other, they primarily conform to the Frankish king, whom they make well informed about all happenings in the country they stay in. Thus Prince Rastislav turns to Rome and asks for an archbishop to be able to start building an independent Moravian diocese. However, the Pope refuses his requirement because in these times he is having dissension with West Francia and does not want to lose a powerful ally – East Francia.

Thus Rastislav sends a delegation to Byzantium. In 862 the Byzantine Emperor Michael III answers by sending back a mission whose occupation is to spread Christianity. As for the fact that Great Moravia was not fully Christianized at that time, there was no archbishop in the mission. In the centre of the mission were two important figures – brothers Cyril and Methodius.

What could the Byzantine Empire offer to Great Moravia in the field of education? Let's leave aside the political and theological aspects of the mission for a while and point out, that Byzantium complied with Rastislav's request out of political reasons as well. They considered Great Moravia a possible ally.V šabloně jsou přednastavené styly pro název příspěvku, jméno autora, abstrakt, klíčová slova, dvě úrovně nadpisů, normální text, nadpis literatury, seznam literatury, nadpis kontaktních údajů a text kontaktních údajů.

2 Byzantium and its role

Although the Byzantine Empire was one of the most powerful ones in Europe in the 9th century, it had to deal with extensive problems that resulted in two groups standing against each other – the iconodules and the iconoclasts – i.e. those who supported and favoured religious images and those who were against the use of religious images. Struggles between iconodules and iconoclast were put an end only by regent Theodora (842-856), who proclaimed the restoration of icons in 843.

In spite of these internal conflicts, the Byzantine Emperor still considered himself the head of all Christians and had the right to intervene into all ecclesiastic matters. The patriarch of Constantinople was subordinate to him and in the eyes of Byzantium not even the Pope could stand above the emperor. This type of rule is known as caesaropapism.

Rastislav's delegation comes to a town that prides in flamboyance and pomposity that has no counterpart in its times. At the same time, the delegates are aware of the uneasy position of the empire. It is threatened from several sides: by the Arabs, by the restoring Bulgarians, and even from Russians.

Emperor Micheal III perceives it an opportunity to secure at least the east borders of his realm and that is why he complies with Rastislav's request.

3 Educational system in the Byzantine empire

The basic skill was the ability to read. "*All Byzantine Emperors – except for Justinian I and Basil I – were able to read, and even to write on their own. Also it was common for military commanders to take portable bookcases to campaigns with them. These contained books about tactics, meteorology and dream interpretation. The legislation also required the ability to sign one's name.*" (Zástěrová a kol., 1992, p. 365) The whole Byzantine system was based on achievements and abilities, not on hereditary privileges. Literacy was not restricted only to higher social layers as it was in the West. It was for everyone, for broad masses. Moreover, every judge and higher clerk had to go through the whole system of education.

The system consisted of three levels. Elementary education lasted for three years. The teacher, who was called *grammatistes*, taught reading from the Bible, writing and basics of arithmetic. This education was available at schools that existed within village churches. The second level was lead by *grammatikos*. At its basis was reading and philological interpretation of Homer's poetry. Homer and the Bible formed the very core of all Byzantine education. Teachers of the third level were called *rhetors* and their teaching focused on rhetoric, philosophy and mathematics. There was an opportunity to take additional studies of laws and medicine. The whole education lasted from eight to nine years.

Since the 9th century, natural sciences are being introduced into the system of education. This is considered to be an influence of Arabian education. For example, the mathematical sciences consisted of mathematics, geometry, arithmetic, and harmony (Zástěrová a kol., 1992, p. 366).

As already mentioned, elementary education was available to everyone. Higher education was realized only in big towns: Athens – philosophy, Alexandria – philosophy and medicine, Beirut – laws, and later on Constantinople – philosophy.

Although the emperor had power over the Church, higher education did not include theology at all. Church was left with some freedom in this field and the education was realized predominantly at monasteries. Only in the 12th century, secular and theological education began to merge and theology became a part of higher education studies.

As far as secular education is concerned, an interesting display of authors can be found here. They are: Homer, Démosthenes, Isokratos, Thukydides and some of Greek authors of tragedies. However, it is important to remind that Byzantine education was never concerned with temporary literary development, neither was it interested in the authors of preceding eras.

4 Specific literary compositions

Graduates of schools should have been well prepared mainly in the field of stylistics. To achieve this goal, teachers had a set of literary compositions students had to handle. Among these were: a fable (usually about animals, *mythos*), a short narration (usually of a mythological character, *diegma*), a short instructive and moralizing anecdote (*chreia*), an essay about a statement (*gnome*), demonstration of evidence and counter-evidence of a maxim or a story (*anaskeue* and *kataskeue*); frequently introduced statement (*koinos topos*); praise and dispraise (*enkomion* and *logos*); comparison of two characters, towns,

activities etc. (*sykrisis*), characteristics of a historical or mythological figure (*ethpoiia*); description of persons, actions, periods, or places (*ekfrasis*); theses about technical or practical questions; draft law (Zástěrová a kol., 1992, p. 366).

All compositions were based on rather conservative topics. Even in the 12th century it was quite common to write essays about themes like the following: "What would a sailor say if he saw an Ikarus flying in the air."

5 Further development

In spite of considerable territorial losses in the 6th century when the Arabian invasion caused the loss of more than 470 towns in Syria, Egypt and Palestine, the educational system was still able to produce sufficient amount of qualified graduates. In the 9th century, Micheal III reestablished universities in Constantinople with one university in the emperor's palace itself. It was led by the eminent Lev Matematik. He might have been a supporter of iconoclasm but he possessed such an extensive knowledge, that the emperor's court gladly turned the blind eye on this personal trait of his.

Utility of the whole system is proven by the fact that in the 9th and 10th century between fifty to hundred students graduated from universities in Constantinople every year (in those times Constantinople had about 1 million citizens).

If we compare this system to the western one, we realize that the eastern is far more elaborate. However, ecclesiastic education of monks consisted mainly on memorization of chants even in the East.

6 Contributions to Moravia

The Prince Rastislav called for an archbishop whom he never got. Instead, he gained people who proved themselves far more important in the end – teachers, who taught pupils in his country. He further requested (and received as well) legal regulations, whose interpreter could have been Methodius conveniently, as he was originally a lawyer. When the mission started to translate the Gospels, they must have been pleasantly surprised with the considerably developed Christianity on our territory. Naturally, it was not possible to start with establishing universities straight away. The first step was to teach the pupils to read and write.

Centres of education were being established within churches and monasteries, as we can analogically see in the neighbouring countries. Whether the mission wanted to fulfill the Byzantine practice, it seems probable that it would aim at every person being able to sign his or her name on official documents. We mustn't forget that Great Moravia was in such a state of economic and historical development that it could hardly work without writing – tax collection and comprehensible record of the country's main ideology (i.e. Christianity) was unambiguously conditioned by the creation of suitable writing.

7 Baptism

In early middle ages, a number of European rulers started to understand, that the only way to legally anchor their right to rule was to adopt baptism. Common people were forced to make a substantial change of mind as well. Till the arrival of the missionaries, their lives were predominated by invariant laws of nature. Their gods gave crops to them as an exchange for regular sacrifices. They considered this system as well functioning and now strangely dressed people wanted them to dispense it. It is thus understandable that their worries about crops were significant. That is why baptized people went to the church, but still secretly brought sacrifices to pagan gods at the same time (Třeštík, 2010, p. 129).

The culprit can be seen in the conception of education, which was particularly noticeable on our territory. The problem was not in insufficient language knowledge –many of the prayers were translated into the Slavic language and the terminology was taken over by the Byzantine missionaries. It were the insufficient requirements imposed that created the problem. It is obvious if we compare requirements for bestowing baptism in the West and the East.

In the West it was quite sufficient for the applicant to learn by heart the prayer to God the Father and Credo. Often the requirement was lowered to mere repeating after the priest. Then the person was bestowed baptism and his or her further education comprised of the Ten Commandments, explanation of sins and virtues, and eternal rewards and punishments. The whole learning process should have been longer than seven days but shorter than two weeks. Knowledge shouldn't have been assessed too strictly. Polygamy, popular mainly with the aristocracy, was being overlooked by the Bavarian monks. Probably because of the existence of so called proprietary churches, that belonged to the person on whose private ground they were built.

The mission from Byzantium chose different, quite opposite strategies. Baptism was bestowed only after thorough education. During his or her preparation, the applicant was not allowed to step into the church – they had to stay in a so called narthex (the entrance or lobby area of a church). (Měřínský, 2006, p. 288). The mission was also against the practice of polygamy by the aristocrats. The practice of proprietary churches was also unsustainable. From the legal point of view – according to the Byzantine law all churches belonged to the Church only, no secular power should have any control over its organization.

8 What was adopted by Great Moravia?

As for the fact that Great Moravia was so far from the Byzantine Empire and Constantinople, its patronage was unthinkable. Nevertheless, it became a source of inspiration – as an economic superpower, whose success was caused, among other factors, by substitution of Greek language for Latin. On the Slavonic territory (e.g. in Thessaloniki) it was required that the clerks should speak Slavonic (they even tried to register Slavonic names). On the territories where Byzantium spread Christianity it was common to translate liturgical texts into the vernacular. There was fundamental discrepancy between the concepts of public and church administration. On one hand, there was a stress on the Latin language (in liturgy accompanied with Greek and Hebrew). On the other hand, it was important to conduct the public administration and liturgy in a comprehensible language.

It must have been the requirement of comprehensibility that was so appealing to Rastislav and his successors. Moreover, the realm gained independence and even recognition of its liturgy. Subsequent rulers gradually gave up this privilege later on. They started to follow the example of the Frankish kings and their Latin Church. However, at least southern and eastern Slavs managed to fully exploit the achievements of the mission to their own good.

9 Conclusion

Great Moravia gained a powerful ally in the Byzantine Empire and its position among other European countries improved considerably. Great Moravia took over not only the eastern arrangement but also the whole concept of education in a comprehensible language. The mission must have taken into account the already translated books (from Latin and old German) and adapt the lexical aspects of the new translations to the existing situation. People willingly abandoned the Bavarian priests and happily welcomed priests of their own kind. Old Church Slavonic became one of the most important liturgical languages of the Christian world. The system of education was inspired by Byzantium; schools were established at almost every larger chapel. First, teaching of writing and the language itself started, and then independent Old Church Slavonic works started to emerge. However, thorough education was restricted only to people of higher social layers. The full implementation of the Byzantine scheme – everyone can read and write – was not achieved.

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Primary Paper Section: A

Secondary Paper Section: AM

THE EFFECT OF PHONEME DIFFERENTIATION OF THE BRAIN IN THE LEARNING PROCESS

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The paper is one result of the research project entitled *„Analýza klíčových determinant ovlivňujících proces edukace dětí, žáků a studentů se speciálními vzdělávacími potřebami v kontextu rámcových vzdělávacích programů*“ – SGS 2011 at University of Ostrava.

Abstract: The article analyses the conditions for development of speech in children with mental disorder and the particularities of using speech in social context. It points out the mutual connections between thinking and speech and it puts the emphasis on the development of communication competence in the process of school integration. It gives reasons for the necessity of systematic affecting the development of speech in children with slight mental disorder focused on the phonemic differentiation. It gives information on the results of the research focused on finding and judging the level of phonemic differentiation in pupils in young school age from which the suggestions for special pedagogical theory and practise are derived.

Keywords: verbal communication, communication skills, school integration, social integration, pupils with slight mental disorder, the differentiating ability of the brain, phonemic differentiation, phonemic awareness

Human speech is determined socially, it develops only in social context. Verbal communication is privileged and the most developed means of communication among people. Via verbal communication it is possible to control the behaviour of the members of society according to the respected and recognized standards; it is the basic means in the process of learning. Communication through a spoken word depends not only on expressing abilities to express oneself and talkative readiness, on the way of passing information to speakers but also on the quality of accepting and processing by the listener . Corresponding level in speech and language skills is therefore a significant attribute in the process of social integration. Unfortunately, people with mental disorder often do not meet the demands expected in this sphere. As a result, social integration appears to be the most difficult for those with mental disorder, because the main symptom of mental disorder is more or less considerable deflection in communication, where the rule of proportion can be applied – the more developed stage of mental disorder, the more serious speech disorder. Due to mental disorder the ability to speak develops not only delayed but also in a different way because of different biological conditions. If we consider that the process of education is based on adequately developed speech abilities and skills – both speech spoken and written – different and eventually limited development of speech indicates not only school failure but also difficulties with career and in other spheres of social environment. To prevent secondary consequences of disabilities in case of children with mental disorder it is necessary to emphasize the development of speech from early age.

Pedagogical and psychological point of view, which is applied to outline the system of compulsory education for students with mental disorder, is based on searching procedures, methods and techniques to simplify the process of learning of these students, it is also based on the careful selection of the subject content essential and needed for the orientation in the world, in the area of human relations; eventually for the potential career performance and also the subject content that enables further development and continuation in education after the school attendance is finished. To develop communication skills it is needed to use both systematically and thoroughly all the possibilities given by the educational content as well as by the experience and pieces of knowledge of students with mental disorder. Speech is the product of higher cognitive processes that are retrospectively influenced by the speech, a process of mutual interaction exists here. If we want to support cognitive development of a child, it is important to observe and stimulate the progression of speech and language skills even during the preverbal phase which comes before the verbal communication phase. We must not forget the influence of nonverbal communication, either. It can sometimes work more strongly and convincingly; through nonverbal communication it is possible to express communicative intention that words cannot express. However, the importance of nonverbal communication is often neglected in the case of children with mental disorder.

A healthy child is born to the world with inborn disposition to learn to speak and this disposition is naturally evolved in the contact with speaking people surrounding the child. As children bearing a risk we consider children with mental disorder being exposed to conditions not suitable for the development of speech even in the phase of brain development. Unsuitable conditions arise from both dominant handicap and influential outer surroundings.

By inconvenient internal conditions we consider organic damage of central nervous system that displays as a weakened cognitive activity. Brain cortex is the controlling system of our nervous system and a place of our consciousness. Thanks to it we can remember, realize things and communicate . As a consequence of its weakened functionality the connection between the analyzers is made with difficulties and the result is overall psychomotor delay. Here the negative role is played by the general disruption in dynamics of nerve processes. From the very beginning the speech is developed slowly and deformed. Inconvenient external conditions are often caused by inadequacy or lack of speech stimulation, improper speech model, negative educational approach etc. In the case of children with mental disorder, inconvenient internal preconditions often combine with not so positive external influence of the surroundings. Between the internal and external factors influencing the development of speech there are complicated mutual relations that are difficult even to specify when judging the development of speech of a specific child. At the same time perception disorders disable kids to gather enough ideas that would support their speech development. As a result of that they misunderstand the meaning of the verbal concepts and that limits their active participation in games, manipulation with objects, thus activities that backward support and influence the development of speech as a basic tool of thinking . Negative consequences of delayed development of speech caused by mental disorder start to appear even during the early period in other spheres of psyche. Generalized speech leads to generalized thinking. Thinking of children with mental disorder is too specific, inaccurate, and wrong in the analysis and synthesis, it is characterized by the weak leading function and considerable uncriticalness, the terms are formed gracelessly and the judgements are imprecise. The insufficient development of speech is often considered the main cause of these . There is even a hypothesis to what extent the level of intellectual abilities is influenced by the organic damage of the brain and to what extent by the role of delayed speech development. Different conditions for speech development in children with mental disorder are reflected in all language levels and the development of speech is disrupted to the extent that it never reaches the standard and on the basis of course it is assessed as a limited development . Therefore the issue of speech development in children with mental disorder is much more complicated than it might seem to be at first sight mainly because of various causes influencing one another. The processes of the imitation and experimentation while acquiring speech are limited because of the mental disorder and for that reason it is necessary to pay higher attention to the stimulating programmes encouraging the development of speech. In the case of the symptomatic disorders of speech in children with mental disorder it is obvious that elimination of the influences of the dominant disability is not possible but the negative consequences can be compensated by timely support of the development of speech and language abilities with the stress on the usage of all the means of expression.

In children with slight mental disorder the delayed development of speech is usually the first signal of the developmental deflection from the standard. It is demonstrated mainly by so

called phonetic-phonemic disorders manifesting itself in low level of phonetic differentiation of sound close phonemes and difficult sound analysis of words. Differentiating ability of the brain mainly in the sphere of hearing and motoric skills stands in the shade of the mechanisms of perception and production of speech. It guarantees the ability to differentiate even the smallest sound differences during a continuous speech and at the same time to precisely grade the movements of convoluted components of the articulatory system in order to make the produced sound reach the shape of comprehensible speech. Phonologic processes are essential for acquiring the speech and also they are closely connected with higher cognitive processes. On that account we can predict their mutual interaction. The correct development of phonemic differentiation usually contributes to the correct pronunciation, to understanding of the meaning of words and on the contrary the proper pronunciation encourages phonemic realization. While with the pathologic cortical activity and slower formation of connections between analyzers in children with mental disorder the opposite tendency appears. As a result of a weakened brain cortex, which influences the quality of higher cognitive processes at the same time, the differential conditioned connections and dynamic stereotypes in the cortical areas of auditory analyzer form more slowly in children with mental disorder. By this the auditory and proprioceptive backward afferents are weakened which is reflected in the insufficient discrimination of phonemes. The Phonemic awareness as the most complicated level of phonologic processes and the highest quality indicator of the phonetic phonological abilities of a child is then differentiated more slowly and in worse quality. Children with mental disorder cannot distinguish the sounds of continuous human speech for a long time and as a consequence of the week connections of the centres of fine motor skills we can expect frequent incompleteness in the articulation.

Insufficient phonemic differentiation slows down the improvement of pronunciation, it disturbs the understanding of word meaning and the improper pronunciation limits the improvement and makes understanding of phonemic awareness more difficult. In connection with the mental disorder it is necessary to respect the fact that the achieved level of phonemic differentiation that is achieved depends on the abilities of a child to perform thinking processes .

For that reason the development of speech in children with mental disorder falls behind the intact population and it also takes place differently in the particular language levels. When putting words into sentences they rely on simpler forms, the meaning of the words is more specific, it has less dominant role in conversation, the change from a concrete name to a term is long and inaccurate, different and incorrect usage of phonological rules leads to more frequent occurrence of different articulation.

From the above mentioned it is obvious that the perception of sounds of human speech is not a simple thing and it is not ensured by a sufficient auditory acuity only . It is the result of a complicated analysis and synthesis where those phonemic features are chosen from the complex of sound features that have signal importance for certain language. Thus it is not enough to hear, it is important to distinguish between the sounds which means to differentiate or discriminate words or verbal units according to the specific characteristics in their acoustic structure. Without the proper accuracy in understanding the whole word, mainly of similarly sounding phonemes, the child cannot separate slight differences in the connotations of many words. That slows down learning of vocabulary and grammatical structure of the language; it influences the pronunciation and makes the development of communication skills more difficult. To acquire a word it is not enough just to learn it, but it is necessary to be able to use it in the real conditions of communication context and for the specific communication purposes.

The risks of acquiring universal, effective and open communication with adequate language means in pupils with mental disorder follows from

• a long-time unfavourable internal conditions connected with a dominant disability

• a long-time unfavourable external conditions, e.g. in the form of absence of the early stimulation, late or surface diagnosis, the unawareness of specific unusualness of an ontogenetic development of speech, the application of ineffective methods in speech education etc.

It often happens that the period of preschool and young school age is not used to create basis for the mother tongue. Positive results of some researches in the area of the aimed stimulation of phonemic awareness in pupils with slight mental disorder, on the contrary shows the possibility of how to effectively affect the quality of orientation in sound structure of spoken speech that is the precondition of understanding . The emphasis on the development of phonologic processes supports the refinement of the meaning of words, vocabulary extension, acquiring grammatical rules of spoken word and the improvement in pronunciation. The attributes stated above improve the motivation to study and influence positively learning of reading and writing and the whole process of communication competence in children with slight mental disorder.

We focused the research on finding the level of chosen areas of phonemic differentiation in pupils of young school age.

We took up interest in the results of these representative samples:
1.intact pupils of major society
2.intact pupils of Romani ethnic group
3.pupils with slight mental disorder

The Interpretation of the results of the research

The results found by the empirical investigation confirm the theoretical basis about the irregular development of differentiation abilities of the brain. Phonemic differentiation is developed as a result of the coordinated activity of analyzers together with the development of higher cognitive functions. It is not sufficient just to distinguish the fundamental verbal sounds only by hearing, the child has to realise and understand the sound structure of a spoken unit. It is the ability to consciously handle the sound of human speech on the level of words, syllables and phonemes. Phonological processes come under a “schedule” of physiological development; they mingle with each other and are demonstrated by the level of phonemic awareness. Firstly, a child differentiates the basic sounds of a mother tongue, later more detailed sounds and then it learns to differentiate even the slightest differences between phonemes by hearing. The standard for reaching the appropriate phonemic level of differentiation is the age of seven or eight years as this age is logically connected with the beginning of school attendance. A child starts to understand that syllables and words are formed by the sounds of human speech that are represented by graphic characters. Phonemic awareness enables to distinguish between the elements of speech and to understand the content of the communication. It is the area of auditory perception that takes part in the determination of the vocal structure of words and the manipulation with phonemes in a word.

The results of the research prove the optimal development of phonemic differentiation only in the case of a group of intact pupils from the major population. In intact pupils from Romani ethnic group and the pupils with slight mental disorder the level reached in ability to break down human speech to words, syllables and phonemes is approximately the same but it, however, is located in the plain of good and low level which is a very alarming condition for learning graphic form of speech. (see the table)

Table: The overall evaluation of the results for chosen sample of empiriali investigation

the level reached	the intact pupils of major population	intact pupils from Romani ethnic group	pupils with slight mental disorder
0-49,9%		omission of phonemes	omission of phonemes
		omission of syllables	omission of syllables
		substitution of phonemes	substitution of phonemes
		production of rhymes	production of rhymes
		analysis of words into phonemes	analysis of words into phonemes
		isolation of first syllable	
50-79,9%	omission of phonemes		isolation of first syllable
	omission of syllables	awareness of rhymes	awareness of rhymes
	substitution of phonemes	synthesis of phonemes	synthesis of phonemes
	production of rhymes	isolation of first syllable	isolation of first syllable
		synthesis of phonemes	
80 – 100%	synthesis of phonemes		synthesis of syllables
	analysis of words into syllables	analysis of words into syllables	analysis of words into syllables
	synthesis of phonemes		
	analysis of words into phonemes		
	isolation of first phoneme		
	isolation of first syllable		
	awareness of rhymes		

note: When judging the level of phonemic differentiation in observed tasks the criteria are used as following:
• low level 0 – 49,9%
• good level 50 – 79,9%
• high level 80 – 100%

The discussion of the results of the investigation

The study of observed development of certain areas of brain showed that children perceive information about the language and word from the early period of life. That influences their development and the process of learning at the same time. It depends both on the biological basis for learning speech, on the way of the mediation of sounds of human speech and on the environment the child is living in. The quality of differentiation of sounds of human speech is influenced by speech inputs intermediated by the contact with people. The precondition of successful learning in the early childhood is a social contact . Auditory and phonemic differentiation takes place even after the first year of life when new reflective connections in the brain are formed. In children, a refined phonemic perception appears at the beginning of the development of speech as the ability to accurately imitate even the slightest differences in sounds of human speech from own microenvironment. Later, with the development of intellect the child gives preference to the content of information rather than to the form and it often apprehends the segments of sounds incorrectly.

Around the third year of life the child starts to differentiate words in the sentence and divides two-syllable words and later more complex words into the syllables. The implemented research proved that all the observed pupils have the area of syllable analysis and synthesis differentiated on a high level. That area is affected by the activities accompanying early and preschool period of development in children that is naturally connected with movement, rhythm, recitation and singing. The amount of experience is then reflected in higher level of the area observed. The immediate perception is guaranteed by the sense perception and then perceptions are registered by the memorial fixation and consolidated by the activating of a commemorative trace . It should be noted that the immediate auditory perception is always selective, based on the individual experience. The ability of syllable analysis and synthesis is differentiated between the fourth and fifth year of a child considering that the syllable synthesis is more difficult than the syllable analysis.

Before starting the school attendance the child should be able to separate the first syllable and the phonemes in a word and decide on whether the words are identical or not. The results of the research confirm that these areas (the isolation of first phoneme, the isolation of first syllable, the awareness of rhyme) are differentiated only in the case of intact pupils of the major society. In other pupils they are differentiated on a good (average) level, which is insufficient state of the phonemic differentiation mainly in children from Romani ethnical groups.

The development of auditory analysis and synthesis takes place during the first few years of school attendance. In close connection with learning of reading and writing the abilities are differentiated to discriminate more precisely the sounds of human speech (the length of syllables, the differentiation of soft and hard syllables) and to manipulate with phonemes in words (leaving out syllables, leaving out phonemes, substituting of phonemes), all these abilities are the precondition for learning the graphic form of speech. If pupils fail in these tasks we can expect problems with understanding of the content of spoken speech, with learning the vocabulary and grammatical rules in spoken speech, with realisation of phonemes more difficult for articulation. The imperfections listed affect the motivation to learn and the overall success of pupils. When reading and writing, the pupils are not able to state the phonemes that form the word or they are not able to create a word from the phonemes. They perceive the words inaccurately, the phonemes blend and that makes it difficult to understand the meaning so children often skip those words.

By the means of the research we found that the processes of phonemic differentiation focused on more difficult manipulation with the phonemes in a word (leaving out phonemes, leaving out syllables, substitution of phonemes) are developed at a good level in intact pupil of the major population and therefore we can assume that during the young school age they will reach a very good level through autocorrection together with learning the graphic form of speech. On the contrary, in pupils from Romani ethnic group and in pupils with slight mental disorder we can expect persistent problems that will certainly reflect in the level of graphic form of speech. These pupils can be considered as bearing a risk in terms of school success because their orientation in more difficult tasks of the phonemic differentiation is on a low level that predicts serious problems while learning to read and write.

Mutual immediate connection between phonemic awareness, the range of vocabulary and thinking is also proved by the results in the area of the production of rhymes. The precondition for the production of rhymes is the range of vocabulary which is dependent on the previous experiences of the child, on the level of the phonemic differentiation and on the higher cognitive function (understanding of situations and logical relationships). Firstly, the child has to understand a new word and its content and then it becomes a part of its passive and later active vocabulary. Vocabulary is a reflection of the development in thinking of every child and conversely learning of new words supports thinking.

The results of the investigation show different precondition for learning in different samples of pupils following from the level of the phonemic differentiation. As alarming we consider the traced differences in the observed areas of phonemic awareness in intact pupils of the major population and intact pupils from the Romani ethnic groups as those follow the uniform curriculum in form of the Frame Educational Program for Primary Education.

The results of the research also show that the pupils with slight mental disorder reach a higher level in those areas of the phonemic awareness that are stimulated more often and where concrete thinking is applied as there is no need to deduce general, essential feature (the an? analysis of a word to syllables, the synthesis of syllables, an isolation of the first syllable, an isolation of the first phoneme, a synthesis of phonemes).

However, they reach lower values in tasks, where the depreciated thinking processes appear more noticeable (a realisation of rhymes, a production of rhymes, an analysis of words into syllables, an omission of syllables, an omission of phonemes, a substitution of phonemes). These tasks expect the ability of more complicated thinking operations, accurate perception, and the division of phonemes in a word, the idea about the order of phonemes in a word.

Based on the analysis of the results of the investigation it was confirmed that in the area of phonemic differentiation there appear deficits in the case of pupils from the Romani ethnic groups and in pupils with slight mental disorder that were studied. The causes of these deficiencies vary and they result in various ratio of long-time unfavourable conditions for the speech development. For this reason the goals set for the development of phonemic differentiation and the means to reach them are different. On the contrary, the consequences of the deficiencies described are the same, mainly in the process of learning. Without the ability to discriminate the sounds of human speech the pupils have difficulties with understanding the slight differences in meaning of words which slows down learning vocabulary and grammatical structure of the language, it influences the pronunciation and makes it more difficult to acquire the speech and language skills. The pupils can differentiate words in the speech of someone else and can reproduce them quite precisely, but they cannot clarify their phonemic structure and the final word is read or written with a mistake. The necessity of a purposeful development of both auditory perception and phonemic differentiation appears as reasonable mainly at the beginning of a compulsory school attendance. The focus on better quality orientation in sound structure of the language can help the pupils from socio-cultural disadvantaged environment and also to the pupils with slight mental disorder to handle an adequate level of communicative competence, which is the necessary precondition for social integration. We must not forget the importance of simultaneous development of cognitive areas. We must conclude that the integrated program focused on the development of phonologic processes is not available in our country yet.

For that reason we recommend that teachers use activities supporting the development of phonemic differentiation in school curriculum that is based on curricular documents for the preschool education and for compulsory basic education . At the same time arises the demand for the improvement of preparations of pedagogues in the area of integration of pupils with special educational needs and their professional qualification particularly in the communicative and diagnostic area. The effort must be made to improve the cooperation of teachers with the institutions providing school consultancy and to enforce the justice of the demand for arrangement of the function of a special pedagogue in an advisory team at primary schools.

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BRAND – A COMPONENT OF A TRAINING ORGANIZATION ON THE POLISH MARKET

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Abstract The paper raises the issues of creating a brand name of training organizations. The considerations start with overview and characteristic definitions of the terms – brand, image or identity. The characteristics of the training market in Poland are also presented and the factors translated onto the image of training organizations.

Keywords: brand, market, customer

1 Introduction

Building a brand name and ability to manage is effectively have become one of the conditions of the strategic sucess of all the organizations, with particular consideration of training organizations. A strong brand name, with stabilized position is a value contributing to the consolidation and development of a company and to attain a beneficial market position.

The organization image itself is the brand name picture, its conception arising in people's minds upon reception and „decoding" of the signals transmitted by the organization through building its identity. The signals so received and encoded in the brand's identity are subject to individual interpretations resulting from human unique characteristics of perception and vision of the environment. It is essential that the training organization image complies with its identity.

A strong, consistent and homogeneous image is used by recognized organizations for building their reputation – the element that decides on their everyday success and provides them with competitive advantage over others. The advantage makes the services of such organizations more attractive to the buyers and, in consequence, their revenues are more stable. The reputation also has an immense influence on the organization's market position. Its shares are bought and the cooperating partners agree to the terms given to them by such organization with more willingness. Thanks to the friendliness of the clients (environment) in a sector recession situation the organizations with appropriate reputation would cope with recession effects better than other entities. Thus, the paper is to present the said elements in a training organization management.

2 Image as an element of a training organization value

The image of an organization, especially an organization functioning in the training sector, is its picture among the people who meet it – clients, business partners, officials, employees, etc. In other words, it means what people think about an organization[1]. The image significantly affects the facilitation of the organization's functioning on the market. The image is affected by the elements that make the organization conspicuous within the environment, make it distinct and easily identifiable.

Image is a complex notion. Image can be understood as pictures in our minds. Walter Lippmann used the definition in his book *Public Opinion* and, although it directly referred to the term „stereotype", it has also become a familiar term in the studies on building image. However, the picture obtained as a result of observations is only a simplification and the picture we create is far from the quality of a modern digital camera, its definition is rather low[2].

Rozwadowska B. in her book *Public Relations Teoria Praktyka perspektywy* [Public Relations – Theory, Practice, Perspectives" specifies the following types of images:

1. Ordinary image – external perception of the organization, common opinions on the organization.
2. Mirror image – perception of organization by itself, both by the employees and management.
3. Desired image – an image the organization aims at, the way it wants to be perceived. Also called wishful or expected image. It is often created on the foundation of the organization concept, often idealistic and fairly difficult to perform.
4. Optimum image – an image that is possible to be performed, expresses viable targets and represents motivation for further actions[3].

The most beneficial position in the activity of a training organization would be the formation of a "desired image" in the long run, while the "optimum image" is a target to perform within a short time interval.

The optimum image wins and attracts the public opinion towards the brand and the organization, removes anonymity between the service supplier and customer, facilitates the mutual communication or enhances the creation attitude towards the organization and its actions, as well as it impacts the sense of acceptance [4].

The organization image formation is influenced by the offer, identity, price, reputation, attitude or style. Organizations, by means of various actions, permanently form their image. The most frequently used measures include: promotion, advertising campaign, public relations, special events and sponsoring actions. These are rather costly measures and not always effective, therefore additional, alternative and effective means of communication with the environment of a training organization are searched for, for example, appropriate organization name and the use of brans, graphic system influencing the vision of the trademark, letterhead prints, promotion materials, formal statements on the organization's mission, its ethical code, standards, values, advertising slogans, architecture of the corporate buildings, interior arrangement or behavior of the staff in daily contacts with the organization's partners[5].

The corporate identity is the sum of elements that identift it, distinguishing is among other entrepreneurs. It is expressed in its unique nature in the visual form[6]. These are the elements that create Corporate identity – the overall identification of an organization, i.e. program to define standards and values, designing corporate symbols, standards of behaviors that create a defined conception of the organization, giving it a unique nature. The identification of an organization is just the presentation of details on the direction it tends towards, its identity and targets.

Corporate identity and image are based on the visualization, i.e. visual presentation composed of the organization name, brand, color range, branding proprietary corporate elements. All the elements affecting the organization image should be adapted to its specifics, nature of business, sector it functions in and they should impress the recipient as well. The elements form a consistent visual system afftecting the organization image in its environment. The techniques used in creatin a corporate identity

[1] Budzyński W., *Public Relations zarządzanie reputacją firmy*, Wyd. Poltext, Warszawa 1998
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[6] Budzyński W., *Public Relations zarządzanie reputacją firmy*, Wyd. Poltext, Warszawa 1998

are within the public relations set of techniques and are often defined as „visual contact techniques"[7].

The researchers provide a number of solutions effective in designing the visual aspects of a training organization. They include simplicity and explicitness, rightness, i.e. adaptation to the organization's nature, originality and distinguishing in comparison to competitors, „eye-catching"[8].

3 Corporate image vs. Brand image

The brand notion is very complex and brand definition has not been unified by date. According to Ph. Kotler:

„Brand is a specific name, mark, symbol, model or combination of the above, given by the seller or a group of sellers to identify a product or service and distinguish them against the competitors' offer"[9]

H. Mruk and I. Rutkowski present brand as: „Name, notion or combination of both elements created to mark a product (or service) of a specific manufacturer and distinguish it from competitors' offer) however, brand may be composed of brand name (the verbal part of brand, expressed verbally) and from the brand sign (recognizable, but impossible to be expressed verbally part of brand, such as symbol, form of characters, characteristic color range – combination of colors, artwork).[10],

J. Altkorn defines brand as: „Product that provides functional benefits plus value added appreciated by some consumers well enough to make a purchase". The author emphasizes that in marketing the approach combining three meanings of brand in it (as mark of certain product range item, as a synonym of trademark in legal references and acts and as a mental leap with a clearly evaluating tone, meaning the market image of a product, is of fundamental importance.

According to J. Kall, we shall call „a bran": „the combination of a physical product, brand name, package, advertising and acconpanying actions in the scope of distribution and price, a combination that provides the consumer with distinct functional or symbolic benefits by distinguishing the combination offered by certain marketeer against competitors' offers, thus creating a loyal circle of buyers and at the same time enabling the brand to attain leading market position"[11].

Analyzing the above definitions one may conclude that brand as it is does not exist on the market, but in the consumers' consciousness. The brand recipients link the symptoms in their consciousness into one picture. Such picture is individually identified by each recipient himself. This is the reason why it is difficult to create a set of criteria explicitly defining a brand and building a brand is complicated as well – it requires imagination, knowledge and power (power meaning having a good idea and vision on which a brand is based) [12].

Brand is frequently perceived as quality assurance or value added received by the client from the organization. The brand itself is formed by a set of six factors, namely:

1. a characteristic when brand is associated with product characteristics searched for by the clients, which is used by organizations as as so-called merchant's arguments in the promotion,
2. functional or emotional benefit arising from possessing a product,
3. value – because it informs on the values supplied by the manufacturer,
4. culture – representing a specific culture of organization or nation,
5. personality – suggesting specific associations with personal characteristics, people, animals or objects,
6. user - suggesting type of client buying and using a product, i.e. purchaser's profile"[13].

Brand sometimes is also treated as a picture or image. The scope of the term "image" in relation to an organization is understood in various ways:

1. sector image,
2. corporate image,
3. brand image[14].

We can talk about the widest scope using the term „sector image", meaning the total image of organizations and institutions functioning within one sector. Generally, the "corporate image" scope is more restricted, however, and limited to the image of a competitor or group of competitive organizations, with a holding structure, for example. The term "brand image" has the lowest reach – comprising a specific product or group of products. We should emphasize that in a situation when the organization's name represents the brand, the scope of both terms can be similar, but never the same / identical." [15].Among marketing practicians two separate terms function, defining the mutual relationships between the organization and brand image:

- integrated image,
- isolated image.

The integrated image occurs when an organization deliberately integrates its image with the brand image. The condition is the sales of products or services under the corporate name without marking them with a separate brand. The isolated image, in turn, appears in a situation when the company creates brands or brand for its products, taking up marketing actions directed to creating an image[16].

Brand image, like corporate image, is a significant element of the process of selection of goods or services offered on the market. it is a complicated set of images and concepts existing in human consciousness, expressing information on the brand and principal attitudes towards it. Thus, the image of a specific brand is composed of both objective elements (information on the brand) and subjective (personal feelings of the buyer). The function of image understood in this way is the possibility to assume an attitude towards a brand without the necessity to analyze other product characteristics contained therein. Thus, the brand image contributes to more efficient decision making by the consumers[17].

We may risk a statement that the corporate image – manufacturer of a specific produt – is a component of the brand conception. The brand image includes, in addition to the conception of the product characteristics, but also the conception about the people who use it and the situations it is used in. From the client's point of view, the corporate image is one of the elements affecting the brand image and the buyer may frequently have to little information about the organization to have its complete image.

The brand identity remains in close relationship with its image (brand image) Unlike brand identity, however, that concerns brand perception in the long run, it is characterized with higher stability and is subject to long-term actions, brand image is determined by its perception by the recipient at a specific moment. This may lead to disturbances, because the method the clients perceive a brand (its image) may diverge from the conception designed by the brand authors (i.e. brand identity). The most frequent reasons for divergencies between the identity

[7] Budzyński W., *Public Relations zarządzanie reputacją firmy*, Wyd. Poltext, Warszawa 1998
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and expected image include: competitors' actions, own and other people's experiences of the environment, no communication consistency, etc. Thus, the image of an organization with specific identity may differ in the consciousness of specific consumer groups, such as: management boards, personnel, shareholders, banks, suppliers or clients[18].

Both quantitative and qualitative testing methods are applied for discovering and creating brand image. The former are mainly used for determination of certain general principles of perception of various brands by the consumers, while the qualitative methods are mainly used for direct market needs, enabling to test the image of a specific brand.

4 The characteristics of the training market in Poland

The training market in Poland is subject to continuous changes and it is in the development phase. In the late 1990's, after a period of fact growth, a stagnation followed (due to the deteriorating economic situation). Only the organizations with a long-term training plans and funds for performance thereof did not restrict their offer on the market.

The demand on the market is strongly polarized. It is created both by large corporations and medium and small entities. The large organizations usually have funds assigned for training in their budgets. However, medium and small entities use training courses occasionally – usually in situations when certain issues occur . Such entities treat training as cost, instead of an investment.

There are various entities offering training services on the market. We can differentiate the following among them:

- private Polish entities,
- private Polish entities with know-how input from other countries,
- international networks,
- academic centers,
- public (state) training institutions,
- associations, foundations.

Ca. 2.500 training entities operate in Poland at present. Due to the lack of reports from training entities, we cannot precisely define the size of the training market in Poland. The number of employees at most of the training organizations on the Polish market is below 10 people, therefore they are not obliged to report their activity to the Chief Statistical Office (GUS).

In the Mazowieckie Province, among the active entities potentially providing training services, organizations employing up to 9 people represented as much as 97% of all the entities[19]. This is due to the fact that training organizations employ third-party trainers under a specific job contract.

In 2001, according to the training demand survey, the size of the training market was estimated as USD 180 mio (the survey was carried out at more than 600 organizations and over 1000 people responded to it[20]).

The value of the training market estimated by Polish Chamber of Training Organizations in 2009 amounted to PLN 2 billion [21].

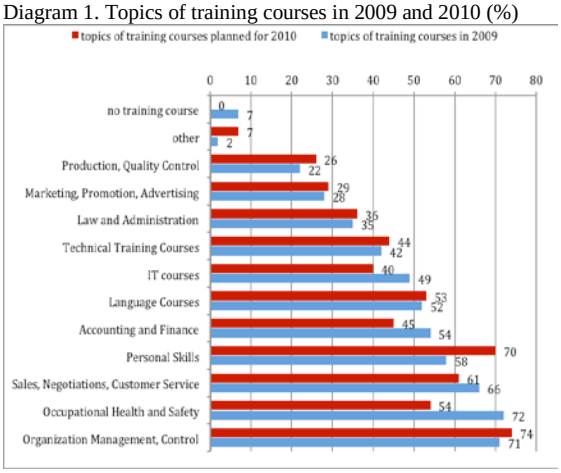
The training organizations have had the opportunity to use the European Social Fund financing for a few years now – the possibilities have changes a lot in the training sector. It significantly affected the change of approach towards improving vocational competence, both in the employers and employees. Thanks to the European Fund co-funding, numerous entities have compensated the overdue aspecs of their employee training. 40% organizations attended training courses co-funded from the European Social Fund, which in average is 35% of the training budget planned[22].

Entities largely use training courses that cover the demand for specialists in a specific area. The largest demand for training is the organization management and control field. Right after that, the companies use training services in the scope of Occupational Health and Safety. Further, entities demand sales, negotiation, finance, banking and languages.

The survey results show that soft training, concerning leadership or customer service aspects dominate among the topics. The topics concerning finance, sales have a great share too.

Analyzing the subject structure, the entity size needs to be considered. Smaller enterprises devote more time to training courses in the field of accounting, finance. One of the reasons is the general cost of training courses – smaller entities incur higher unit costs of training than large ones. Due to the fact that basic training courses (in the scope of technical aspects of production and service provision) are necessary for the correct use of operating measures, small entities spend more time at training courses and incur higher costs.

Diagram 1. Topics of training courses in 2009 and 2010 (%)



Source: "Modern Organization" Magazine, October, 2010, page 8

5 Training forms and methods on the polish market

Among the basic training forms on the Polish market we distinguish the division into:

- external – training courses conducted by a third-party trainer, not employed by the specific organization. The course may take place on the Customer's premises or in the training organization's facility or other place assigned for this purpose.
- internal – training conducted by one of the employees for other people employed by the organization. The course may take place on the entity's premises or other place assigned for this purpose.

Another division of the training companies comprises:

- open training – most frequently organized on the premises rented for this purpose for a large number of attendees. Anybody who paid the fee required may attend the course. The subject matter of the training courses concerns the areas some individuals from various entities are interested in, not whole groups. In case of the training entities organizing such training courses, it is frequently risky. First the training entity must prepare the training course, promote it on the

[18] De Chernatony L., *Marka. Wizja i tworzenie marki*, Gdańskie Wydawnictwo Psychologiczne, Gdańsk 2003
[19] Budzyński I., *Podstawowe aspekty działalności instytucji szkoleniowych w „Rynek pracy"*, Ministerstwo Gospodarki, Pracy i Polityki Społecznej, grudzień 2003.
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market and finally it eithier gains profit or bears loss related to the performance (depending on the interest in the training course subject).

- closed training – organized for a specific company, selected group of attendees. In case of closed training, the training entity pays for "temporary rental" of a trainer for the organization wishing to have the course conducted for its employees. Closed training courses mean that the risk of insufficient interest of the market does not exist in this case. The courses also enable the reduction of unit employee training costs.
- correspondence training – are prepared by a third-party organization The form of such training course can be distributed to any distance and does not require the presence of a trainer during the course. All the people interested may use this training form in any place or time. The knowledge acquired after the course is examined by means of tests sent to a verifier, the trainee also makes a self-assessment.
- studies – this form of training cofmprises university, post-graduation, doctoral studies as well as MBA. This is a specific form of training. Tertiary schools only may carry out such forms of training. This form of training is available to anybody who meet the conditions required, such as: secondary school leaving examination, [entrance] examinations as well as payment of fee required.
- e-learning – this is a correspondence form using all the electronic media available (including the Internet, intranet, extranet). Due to the fact that the computer is the training and examining "party", this form of training has been calles 'distance learning'. E-learning enables the adaptation of the content, pace and form of training to the knowledge and predisposition of the trainee.
- seminars – a form of didactic activities for a small group of people. During the meeting the attendees discuss a specific issue. Seminars are most frequently free of charge.
- conferences – a meeting of a large number of attendees. Conferences are organized in a place and time designated for this purpose (they last one or a few days) in order to discuss a specific subject. They are most often paid for and relatively early annonced by a promoting action directed to the potential recipients [23].

We distinguish the following types of training:

- workshops – during workshops, the attendees acquire theoretical knowledge, however, more stress is put on the skills of its use in practice. Workshops are most frequently carried out in the areas of management, sales or topics related to production/service provision. The attendees solve the problems given to them, most often in the way suggested by the trainer.
- lectures – the simplest training method. it consists in informing on certain aspects of knowledge by the lecturer, without the necessity for any activity on the part of the attendees. Lectures are conducted in large groups, the attendees do not acquire any practical skills, theoretical knowledge only is provided.
- case studies – this type of training is most often carried out in the scope of management. During the course the attendees must analyze the situation and suggest solutions of the issued presented in authentic / hypothetical situations concerning the activity of various organizations.
- simulations – are mini-roles played as described in earlier prepared scenario. This method is often used in training of negotiations, sales. [24].
- computer programs – used in case of e-learning. This method also applies to training of computer and Internet skills.
- outdoor – training consisting in playing roles prepared for the trainees , possibility to prove oneself in a collective performance of tasks given to the trainees. They include integration training, enabling the consolidation of teamwork; most frequently organized outdoors in a special place.

According to the recipients' opinion, workshops are the most effective training method. As for other forms – the recipients' opinions are diversified, depending on the entity size (larger entities are able to verify better the training efficiency due to higher experience and more extensive use of training efficiency assessment tools, "small entities do not appreciate the efficiency of some tools, overestimating the efficiency of other".[25]

6 Training sector development perspectives in Poland

Before Poland's accession to the European Union, the development of the training market used to be dependent on domestic funds (assigned from corporate budgets). At present the situation has changed, because there is an entity on the market - Polish Agency for Enterprise Development having at its disposal funds received from the EU and it decides which projects would be co-funded.

The off-school education market in Poland is developed and we see its permanent growth. In 2009 – in consequence of the economic recession, the organizations reduced their spending on training by ca. 30%, compared to 2008, however, since mid-2010, a growing tendency has been noted again.

The average annual growth of training entity revenues is 15-20 per cent – which should be considered a good result, considering the fact that employers spend the average of PLN 25 on one employee per year.
Numerous factors shall influence the market. They include the growth of demand for training due to the permanently growing competition, which demands continuous qualification improvement, as well as the growing awareness of the "human factor" meaning.

The economic recession brought about a situation that only the strongest enterprises have remained on the market, which is related to gaining advantage and distinction against others. Each organization tends to become distinct offering other value added or the same value at a reduced price[26]. More and more frequently the entities realize that the value added can be the training entity brand.

According to the respondents, the greatest importance in the formation of the corporate image is in the trainers of recognized reputation, competent and competitive personnel as well as recommendations and opinions of the clients.

The lowest importance, in turn, is the position in sector ranking and prizes, sector rewards gained by the organization.

The surveys also suggest that professionalism, good staff, friendly service and individual approach to the client are immensely important for the clients while assessing the brand of a training entity. It also appears that training organizations who care about good brand are forced to permanent market monitoring and analysis of their clients' need. The organizations

[23] Budzyński I., *Podstawowe aspekty działalności instytucji szkoleniowych w „Rynek pracy"*, Ministerstwo Gospodarki, Pracy i Polityki Społecznej, grudzień 2003

[24] *„Rynek Szkoleń 2000 POPYT", „Rynek Szkoleń 2001 POPYT"*; Instytut Zarządzania 2001, 2002

[25] Ekspertyza – *Rynek usług szkoleniowych dla przedsiębiorstw w Polsce*, Instytut Zarządzania, Warszawa 2004

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who care abou their image emphasize that significant changes can be observed in the scope of the subject structure. Since Poland accessed the EU, higher interest is seen among the entrepreneurs in the European legislation related topics and principles of functioning on the European market. The introduction of modern information technologies, in turn, makes the entrepreneurs to expand their knowledge in the scope of IT and computer operation.

However, the highest influence on the market development is made by co-funding of the training courses out of the EU funds, because numerous entities broke through the cost barriers while benefitting from training. This may also influence the offer (development of modern training forms and methods). In 2011 and 2012 the last training projects will be performed, those that have won competitions in 2010, what will happen during the following years is difficult to be projected. Thus it will be another difficult challenge for the training sector entities. However, surveys indicate the fact that recognized organizations of recognizable brand and positive image by far more frequently win such competitions and the later recruitment of the attendees for the training projects goes on very efficiently and effectively.

7 Summary

Image is a way of perceiving an organization by others. We should remember that it is characterized with variability and unstability. It may be consolidated, but it may also be easily destroyed.

In the conditions of strong competition, it is the image that may decide on the trust towards the entity. An organization, while working on its image, becomes conspicuous and most frequently recognized. This applies in particular small and medium enterprises that due to high costs of advertising campaigns must base on PR actions. Regular communication among the staff and outside the environment is not costly to the entity while it enables to create a reliable identity. The entity must remember about a significant fact that it is PR that builds own opinions and views of the information recipient. Such actions are not prompt, however, they are very long-lasting and strong.

The formation of the proper brand image is a long-term action spread in time. The conclusions from the surveys and tests carried out indicate that the image is an important factor representing an element directly deciding on the selection of a training organization.

Due to the fact that the market permanently grows the buyers' needs also grow. Training organizations should regularly carry out marketing surveys concerning the changes taking place on the market. This will enable a company to be more flexible in relation to the competitors' activity.

Strategic actions should be matched to the new challenges that appear. The entities should consider the existing significant restrictions appearing as a result of sticking to the traditional methods of action. It is significant that the entity management board should set the targets and visions for the future, thus creating long-term action strategies.

A thorough analysis of the development issues so far shall allow the entities to orientate their strategies onto attaining the right targets.

In the time of strong market development, the entities will have to pay attention to searching for a discriminant that may include without limitation the brand image that, with substantially consistent offer and similar scope of services, mabe become factor number one.

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Primary paper section: A

Secondary paper section: IN

I INFORMATICS

IN INFORMATICS

FORECASTING ON FOREX MARKET WITH RBF AND PERCEPTRON NEURAL NETWORKS

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Abstract: This work deals with an alternative approach in financial modelling - artificial neural networks approach. The aim of this paper is to show that this type of time series modelling is an excellent alternative to classical econometric modelling. At first, neural networks using methods of supervised machine learning are discussed. After explaining theoretical basis of ANN, these models are then applied to specific exchange rate (AUD/USD). Finally, the comparison between statistical models and RBF and perceptron neural networks is made to illustrate the sense of using ANN models.

Keywords: financial forecasting, neural networks, time series, RBF, perceptron,

1 Introduction to Financial Forecasting

Today, to be able to know a future value of some phenomena is a great advantage, regardless of an area of interest. There is no exception in economic world. Banks want to know interest rate of central banks, forex traders want to know how the value of EUR/USD will be tomorrow etc. Risk management departments of many financial institutions including banks and their financial analytics try to find a "guide" how to do this in the most efficient way in order to minimize their losses and maximize their profits.

The approach, which is used the most and which has been used for many years, is a statistical approach. This approach is represented mainly by ARIMA and GARCH models. However, it has been showed that this technique does not always provide sufficient results.

Because of that reason, other methods, using mainly the power of computers, have been created. Among these methods of machine learning, artificial neural networks, inspiriting by a human neural network, have become very popular. Today, these ANN models have become the interest of many prediction analyzers.

The first part of this article discusses basics and principles of neural networks. Then some basic principles of specific type of artificial neural networks – perceptron will be discussed. Perceptron is a very first representative of a supervised feed forward neural network. Later, various kinds of RBF networks as an upgraded version of supervised neural network will be depicted and then tested.

Later, models of ANNs will be applied to specific exchange rates using a programming application constructed by the author of this work.

Finally, ANN models of tested exchange rate will be compared with classical econometric models which were also quantified to make a reasonable conclusion whether it is worth using artificial neural networks in the economic predictions.

2 Fundamentals of Artificial Neural Networks

2.1 Artificial Neuron: Mathematical Background

The aim of mathematical neuron is a process identification. One tries to find an input-output function so that the output would have desired parameters and the predicted error would be minimal.

Let F: $x_t \in R^k \rightarrow y_t \in R^1$ is a projection assigning k-dimensional vector of inputs $x_t^T = (x_{1t}, x_{2t}, ..., x_{kt})$ one dimensional output y_t in specific time moment t.

Let G: $G(x_t, w_t) : x_t \in R^k_{train} \rightarrow y_t \in R^1_{train}$ is a restriction of F. The task is then to find the values of w_t so that functional values of G would be so close to known sample as it is possible. Let E(w) is function defined as

$$E(w_t) = \sum_{x_t, y_t \in R^k_{train}} (G(x_t, w_t) - y_t) \quad (1)$$

Function defined by (1) represents squares of deviations of function G from expecting values of function F. If a minimum is found, G is adapted for approximation of F. Training or adaption is performed on training set. Validation set is used for validation of training network.

2.2 Perceptron Neural Network

The neural network called perceptron is a feed-forward type of network. It was one of the first neural networks constructed but due to its good properties it had been used till nowadays. It is one of the simplest types of supervised artificial neural networks. As it is feed forward neural network it contains only forward relations which can be realised only from lower layers to higher. The architecture is shown on figure 1.

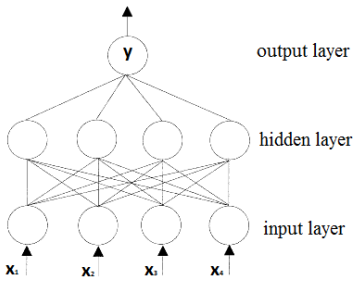

Figure 1 Perceptron neural network with 4 inputs

Vector $x_t^T = (x_{1t}, x_{2t}, ..., x_{nt})$ is a representative of input set of data. Output layer contains only one neuron and is represented by known given output. Between these layers thre is also a hidden layer containing hidden neurons. Using $G(x_t, w_t)$, the inputs are transformed into output when going through the network. The produced output is then compared to the historical output of a data set.

The network tries to get as close as possible to the given output by adapting its weights between input and hidden neurons and between hidden neurons and the output. The aim of learning is to have a trained network (and weights) so that G would approach F the most. The learning of perceptron, is based on back-propagation algorithm.

One should remember that the network quantifies its parameters only using training set. Afterwards a validation using validation set is performed. To compare predictive power of models numerical characteristics such as MSE or MAPE are used.

2.3 RBF Neural Network

Just like perceptron, RBF is a feed-forward neural network. The architecture is almost the same as of perceptron. The three biggest differences comparing to perceptron are calculation of potentials of hidden neurons, different activation function of processing (hidden) neurons and different activation function of output neuron.

In perceptron potentials of hidden neurons was just a simple linear operation of scalar product of vectors W and X. In RBF potential of j^{th} hidden neuron is defined as a difference of Euclidean distance given by vectors

$$u^j = \| x - w^j \|^2 \text{ , for j = 1,2,....s} \tag{2}$$

Moreover, RBF uses different types of activation functions (Gaussian or radial basis function) defined for j[th] hidden neuron as

$$\psi_2(u^j) = e^{\frac{-u^j}{2\sigma_j^2}} = e^{\frac{\|x-w^j\|^2}{2\sigma_j^2}} \text{ , for j = 1,2,....s} \tag{3}$$

where σ_j^2 is a variance of j[th] neuron.

Activation function of output neuron is also different, output neuron is always activated by a linear function y = x.

Learning process of RBF

RBF learning is performed by back-propagation algorithm defined as:

1. Introduction of input vector $x_t = (x_{1t}, x_{2t}, ..., x_{kt})$ from training set. X is then weighted by vector $w_t^j = (w_{1t}^j, w_{2t}^j, ..., w_{st}^j)$ and enters the hidden neurons. The output of every hidden neuron is counted as $o_t^j = \psi_2(u_t^j)$. These outputs are then weighted by vector $v_t^j = (v_t^j, v_t^j, ..., v_t^j)$. The total output of the network is then counted as $\hat{y} = \psi_3(u_t) = \sum_{j=1}^{s} v_t^j o_t^j$ This output is then compared to expected (known) value y and the error $e_t = y_t - \hat{y}_t$ is quantified.

2. On the base of back propagation of error e_t weights v are adapted

$$v_t^j \leftarrow v_t^j + \Delta v_t^j \tag{5}$$

where $\Delta v_t^j = \eta e_t o_t^j$ is an error term (for j = 1,2,…s)

3. Analogical adaptation of w_{rt}^j and variances σ_j^2 on the base of error term e_t using gradient method

$$w_{rt}^j \leftarrow w_t^j + \eta \Delta w_{rt}^j \tag{6}$$

$$\sigma_j \leftarrow \sigma_j + \eta \Delta \sigma_j \tag{7}$$

assuming that error terms Δ have the form

$$\Delta w_{rt}^j = e_t v_t^j \frac{1}{\sigma_j^2} \exp[-\sum_{r=1}^{k} \frac{(x_{rt} - w_{rt}^j)^2}{2\sigma_j^2}](x_{rt} - w_{rt}^j) \tag{8}$$

$$\Delta \sigma_j = e_t v_t^j \exp[-\sum_{r=1}^{k} \frac{(x_{rt} - w_{rt}^j)^2}{2\sigma_j^2}] \frac{(x_{rt} - w_{rt}^j)^2}{\sigma_j^3} \text{ ,}$$

j = 1,2,....s , r = 1,2,....k (9)

Iterative performing of epochs (repeating for every inputs of the training set) while the networks is considered to be learned (adapted) – error function achieves a minimum.

3 Application of Feed Forward Neural Networks to AUD/USD Exchange Rate

Exchange rate of AUD/USD will be applied to neural network model to show the predictive power of ANNs. The number of daily observations is 1044 and data are taken from 03/01/2007 to 03/01/2011. Due to finding out the predictive power of ANNs, data were divided into two parts – the training set contained 1002 values (03/01/2007 – 12/31/2010) and the validation set (for model verification) contained 42 observed values (01/01/2011– 03/01/2011). The validation set will be used for making ex-post (false) prediction to find out how the network manages with unknown data. The ANN modeling was performed by self-constructed application and econometric models were quantified in Eviews.

3.1 Prediction Process with Neural Networks

In order to have inputs entering into neural network we used Box-Jenkins model to determine autoregressive order in our data. By using Box-Jenkins identification procedure it was founded out that AUD/USD for the specific time period can be econometrically modeled using AR(0) process with only GARCH effect. Therefore, to have any inputs, the previous value (the first lag) was integrated into the input layer of this neural network.

Data from training set enter into network, then they are propagated through it and finally the value is produced by ANN. This value is then compared with a historical value (in the training part) and the error (MSE or RMSE) is counted. Adaptation of weights is performed using error values. At first, perceptron network was tested and the results are shown in table 1. The results are achieved after 2000 epochs.

Table 1 MSE_E achieved for AUD/USD (perceptron)

N / η	0,001	0,01	0,05	0,10	0,20	0,30	0,50
1	0,124056	0,087272	0,028243	0,014337	0,007650	0,005536	–
2	0,137236	0,064142	0,002228	0,002249	0,002344	0,002530	–
3	0,100385	0,002195	0,002262	0,002301	0,003671	0,003012	–
4	0,110228	**0,002173**	0,002259	0,002339	0,002663	0,003183	–
5	0,095508	0,002193	0,002274	0,003792	0,003343	0,003165	–
6	0,120620	0,002252	0,002397	0,002631	0,002950	0,003160	–
8	0,104851	0,003679	0,002395	0,002740	0,003202	0,003280	–
10	0,047155	0,002690	0,002828	0,003239	0,003357	0,003735	–
20	0,038187	0,003567	0,003240	0,003422	0,004718	–	–

The optimal speed of learning was set to η = 0,01, η = 0,05 respectively. Using this value of η parameter the network was able to well adapt on the specific data. The higher values were the reason for vibration of the network. The best value of MSE_E (0,002173) were achieved with 4 hidden values and with η = 0,01. However, very similar values were counted in some other cases. From that reason it can be concluded that perceptron trained by these data has the local minimum oscillating near the value of 0,002.

Next, RBF network as an upgrade of perceptron was tested. Extensions of this network were tested too - soft RBF, cloud RBF and granular RBF. Various RBFs were tested using only η = 0,05 as it was experimentally determined that this is a reasonable compromise between the expecting result and the time of adapting. Table 2 shows the tested results.

Table 2 MSE_E achieved for AUD/USD (RBF network)

Number of hidden neurons	Type of RBF			
	Classical RBF	Soft RBF	Cloud RBF	Granular RBF
1	0,0001836	0,0001834	0,0000813	0,0001842
2	0,0000841	0,0001834	0,0003693	0,0000659
3	0,0000932	0,0001834	0,0001348	0,0000523
4	0,0001285	0,0001834	0,0001514	0,0000368
5	0,0001685	0,0001834	0,0001255	0,0000332
6	0,0002609	0,0001834	0,0004750	0,0000407
7	0,0002416	0,0001834	0,0005516	**0,0000282**
8	0,0002714	0,0001834	0,0004215	0,0000341
10	0,0003209	0,0001834	0,0001889	0,0000324

As for RBF, the best neural network model for making ex-post predictions is the granular RBF network with architecture (1 – 7

-1). The RMSE for approximation was quantified to be 0,031223 and RMSE for ex-post predictions was quantified to be 0,005316. Figure two and three illustrate the graphic development of original and estimated / predicted values.

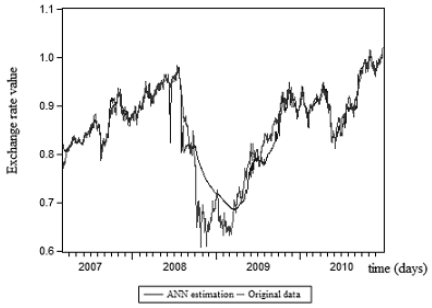

Figure 2 Original and estimated values of training set for AUD/USD

Figure 3 Original and estimated values of validation set of AUD/USD

Finally these neural network models quantified above were compared to traditional econometrical models which are the major tool for making predictions in various financial institutions. Comparison for the exchange rate AUD/USD is in the table 4. The models are compared according to their RMSE error in validation set.

Table 3 Comparison of Statistical and Neural Networks (AUD/USD)

	Model Type	**$RMSE_E$**
1.	Granular RBF (1 – 7 – 1)	0,005316
2.	AR(0) + TGARCH(1,1,1)	0,006205
3.	RBF (1 -12 – 1)	0,009063
4.	Perceptron (1 – 4 – 1)	0,046615

4 Conclusion

This paper dealt with neural networks forecasting and modelling. These models were applied to exchange rate modeling to compare their predictive power to traditional statistical models and methods. As for ANN, the parameters tested the most were the speed of learning and the number of hidden neurons. These parameters were tuned in order maximize the accuracy of predictions of the network.

As for neural networks, two feed forward neural networks were tested - perceptron and RBF network. As assumed from theory, perceptron did not achieve comparable results with RBF network. The value of 0,002 is a lot of worse than the error of RBF or statistical model. RBF network as an upgrade of perceptron was tested too. Moreover, extensions of this network were tested too – soft RBF, cloud RBF and granular RBF network. Generally speaking, RBF extensions provided better results than standard RBF. (granular RBF had the best results). The neural network models were finally compared to statistical models by using error function MSE and RMSE. From this statistics it can be concluded that neural network models (mainly RBF and its extensions) are comparable to statistical models, in some cases (extensions of RBF) ANN models even overcame statistical models. Therefore artificial neural networks as a representative of modern computing techniques for prediction process can be definitely considered as a great alternative to statistical model

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Primary Paper Section: I

Secondary Paper Section: IN

TO PREDICTION OF PERFORMANCE IN PARALLEL ALGORITHMS

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Abstract: With the availability of powerful PC and networking devices, the recent trend in parallel computing is to connect a number of individual workstations to solve computation intensive tasks in parallel way on connected class of workstations. Current trends in high performance computing are to use networks of workstations as a cheaper alternative to traditionally used massively parallel multiprocessors or supercomputers. The individual workstations as parallel computers based on modern symmetric multicore implemented within workstation. To exploit the parallel processing capability of such cluster, the application program must be paralleled. On application ex. we demonstrate the various influences in process of performance prediction modelling and the consequences for their parallel implementations.

Keywords: network of workstations, parallel algorithm, performance modelling, performance prediction, isoefficiency, communication overheads.

1. Introduction

There has been an increasing interest in the use of networks of workstations (NOW) connected together by high speed networks for solving large computation intensive problems [9, 12]. Their typical architectures are at Fig.1. and its alternative modification at Fig 2.

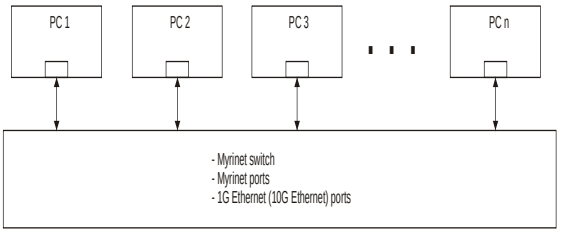

Fig.1. Typical architecture of NOW.

This trend is mainly driven by the cost effectiveness of such systems as compared to parallel computer with massive number of tightly coupled processors and memories. Parallel computing on a cluster of powerful workstations connected together by high speed networks have given rise to a range of hardware and network related issues on any given platform.

Effective use of these parallel computers requires a detailed understanding of the new complexities of parallel programming. Performance bottlenecks will be many times larger than was the case for the smaller parallel machines that have been in use last decade. The increased complexity of more complex NOW (single PC workstations, symmetrical multiprocessor workstation – SMP) makes it difficult to accurately predict execution time for a particular application.

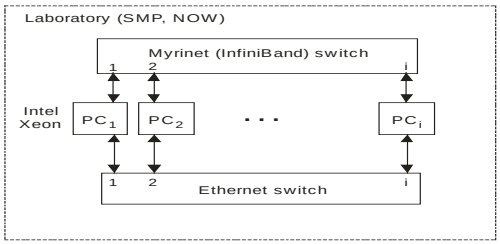

Fig.2. Alternate architecture of NOW.

It has been therefore difficult to develop simple formulations to predict the execution time of parallel programs due to the complexity of characterising parallel hardware and software. In an attempt to clarify these characterisations, we introduce a methodology for applying a simple prediction performance model based on isoefficiency concept law. Our formulation results in predictions of execution time not only on available systems but also for theoretical parallel systems. This allows programmers to select the optimal number of processors to apply to a particular problem or to select an appropriate problem size for the number of processors available. In short, we are able to quantify the scalability of a specific algorithm when it is run on a specific or on theoretical parallel computer. Our results illustrate key performance limitations of parallel systems, showing the impact of overhead and the scaling of problem size.

2. Parallel algorithms

In principal we can divide parallel algorithms into two following classes

- parallel algorithm using shared memory. These algorithms are developed for parallel computers with dominated shared memory as actual symmetrical multiprocessors or multicore systems (SMP)
- parallel algorithm using distributed memory (DPA). These algorithms are developed for parallel computers with distributed memory as actual NOW system and their higher integration forms named as Grid systems.

The main difference is in form of inter - process communication (IPC) among individual parallel processes. Generally we can say that IPC communication in parallel system with shared memory can use more possibilities than in distributed systems.

2.1. Developing parallel algorithm

To exploit the parallel processing capability the application program must be parallelised. The effective way how to do it for a particular application problem (Decomposition strategy) belongs to the most important step in developing a effective parallel algorithm [5]. The development of the parallel network algorithm includes the following activities

- decomposition - the division of the application into a set of parallel processes
- mapping - the way how processes and data are distributed among the nodes
- inter-process communication - the way of corresponding and synchronisation among individual processes
- tuning - alternation of the working application to improve performance (performance optimisation).

The most important step is to choose the best decomposition method for given application problem. To do this it is necessary to understand the concrete application problem, the data domain, the used algorithm and the flow of control in given application. When designing a parallel program the description of the high-level algorithm must include, in addition to design a sequential program, the method you intend to use to break the application into processes (decomposition strategy) and distribute data to different nodes (mapping).

3. Performance modelling

To performance evaluation of parallel algorithms we can use analytical approach to get under given constraints analytical laws or some other derived analytical relations. The most known analytical relations have been derived without considering architecture and communication complexity. That means a performance $P \approx f$ (computation). Such assumptions could be real in many cases in existed massively multiprocessor systems in the world but not in NOW and Grid.

In NOW we have to take into account all aspects that are important for complex performance evaluation according the relation $P \approx f$ (architecture, computation, communication, synchronisation etc.). Theoretically we can use following solution methods to get a function of complex performance

Quantitative evaluation and modelling of hardware and software components of any parallel systems are critical for the delivery of complexity and high performance of used parallel

algorithms [2]. To evaluate parallel algorithms there have been developed several following fundamental concepts

- analytical
  - application of queuing theory [4, 6, 7]
  - asymptotic analysis [3, 8]
  - Petri nets [7]
- simulation [10]
- experimental measurement [3].

3. 1. Performance metrics

To evaluating parallel algorithms there have been developed several fundamental concepts. Tradeoffs among these performance factors are often encountered in real-life applications.

3.1.1. Speed up

Let O(s, p) be the total number of unit operations performed by p processor system, s defines size of the computational problem and T(s, p) be the execution time in time units. Then speedup factor is defined as

$$S(s,p)=\frac{T(s,1)}{T(s,p)}$$

3.1.2. Efficiency

The system efficiency for a p processor system is defined by

$$E(s,p)=\frac{S(s,p)}{p}=\frac{T(s,1)}{p\,T(s,p)}$$

3.1.3. Scalability metrics

Scalability metrics describe the application characteristics in terms of relative gain or loss in performance as a function of the number of the allocated resources. A popular measure of how effectively an application uses a given parallel system is speedup.

3.1.4. Isoefficiency concept

The workload of any parallel algorithm often grows in the order O(s), where s is the size of concrete problem. Thus, we denote the workload w = w(s) as a function of s. In parallel computing is very useful to define an isoefficiency function relating workload to machine size p needed to obtain a fixed efficiency E when implementing a parallel algorithm on a parallel system. Let h be the total communication overhead involved in the algorithm implementation. This overhead is usually a function of both machine size and problem size, thus denoted h = h(s, p). The efficiency of a parallel algorithm implemented on a given parallel computer we defined using workload and overhead functions as

$$E(s,p)=\frac{w(s)}{w(s)+h(s,p)}$$

The workload w(s) corresponds to useful computations while the overhead h(s, p) are useless times related to synchronisation and data communication delays. In general, the overhead increases with respect to both increasing values of s and p. Thus, the efficiency is always less than 1. The question is hinged on relative growth rates between w(s) and h(s, p).

With a fixed problem size (fixed workload), the efficiency decreases as p increase. The reason is that the overhead h (s, p) increases with p. With a fixed machine size, the overload h grows slower than the workload w. Thus the efficiency increases with increasing problem size for a fixed-size machine. Therefore, one can expect to maintain a constant efficiency if the workload w is allowed to grow properly with increasing machine size.

For a given algorithm, the workload w(s) might need to grow polynomial or exponentially with respect to p in order to maintain a fixed efficiency. Different parallel algorithms may require different workload growth rates to keep the efficiency from dropping, as p is increased. The isoefficiency functions of common parallel algorithms are polynomial functions of p; i. e., they are O (p^k) for some k ≥1. The smaller a power of p in the isoefficiency function is, the more scalable the parallel system. Here, the system includes the algorithm and architecture combination.

We can rewrite equation for efficiency E(s, p) as E(s, p)=1/(1=h(s, p)/w(s)). In order to maintain a constant E, the workload w(s) should grow in proportion to the overhead h(s, p). This leads to the following relation:

$$w(s)=\frac{E}{1-E}h(s,p)$$

The factor C = E/1-E is a constant for a fixed efficiency E. thus we can define the isoefficiency function as $f_E(p)$=C. h(s, p). If the workload grows as fast as $f_E(p)$ then a constant efficiency can be maintained for a given algorithm-architecture combination.

4. Modelling of complexity in parallel algorithms

To this time known results in complexity modelling on the in the world used classical parallel computers with shared memory (supercomputers, SMP and SIMD systems) or distributed memory (Cluster, NOW, Grid) mostly did not consider the influences of the parallel computer architecture and communication overheads supposing that they are lower in comparison to the latency of executed massive calculations.

In this sense analysis and modelling of complexity in parallel algorithms (PA) is rationalised to the analysis of complexity of own calculations, that mean that the function of control and communication overheads are not a part of derived relations for execution time T (s, p). In this sense the function in the relation for isoefficiency suppose, that dominate influence to the overall complexity of the parallel algorithms has complexity of performed massive calculations. Such assumption has proved to be true in using classical parallel computers in the world (Supercomputers, massively multiprocessors – shared memory, SIMD architectures etc.). To map mentioned assumption to the relation for asymptotic isoefficiency w(s) means that [2]

$$w(s)=\max\ \left[T_{comp}\,,\,h(s,p)<T_{comp}\right]=\max\ \left[T_{comp}\right]$$

In opposite at parallel algorithms for the actually dominant parallel computers on the basis NOW (including SMP systems) and Grid is for complexity modelling necessary to analyse at least most important overheads from all existed overheads which are [1, 11

- architecture of parallel computer
- own calculations (T_{comp})
- communication latency (T_{comm})
  - start - up time
  - data transmission
  - routing
- parallelisation latency (T_{par})
- synchronisation latency (T_{syn}).

Taking into account all this kinds of overheads the total parallel execution time is

$$T(s,p)_{complex}=\sum\left(T_{comp}+T_{par}+T_{comm}+T_{syn}\right)$$

, where T_{comp}, T_{par}, T_{comm}, T_{syn} denote the individual overheads for calculations, parallelisation overheads, communication and synchronisation overheads. The more important overhead parts build in the relation for isoefficiency the used the overhead function h (s, p), which influence in general is necessary to take into account in performance modelling of parallel algorithms. In general nonlinear influence of h (s, p) could be at performance

parallel algorithm modelling dominant (Fig. 3.). Then for asymptotic isoefficiency analysis is true

$$w(s) = \max\ \left[T_{comp}\,,\, h(s,p)\right]$$

, where the most important parts for dominant parallel computers (NOW, Grid) in overhead function h (s, p) is the influence of T_{comm} (Communication overheads).

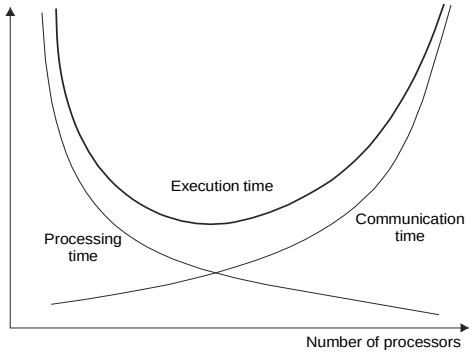

Fig. 3. Relations among times in parallel algorithms.

Processing time $T(s, p)_{comp}$ of parallel algorithm is given through quotient of sequential running time (Complexity product of sequential algorithm Z_{sa} and a constant t_c as a average value of performed calculation operations) through number of used calculation nodes of the given parallel computer. Parallel calculation complexity of T(s, p) as a limit of a theoretical unlimited number of calculation nodes is given as

$$T(s,\mathrm{p})_{comp} = \lim_{p\to\infty} \frac{Z_{sa}.t_c}{p} = 0$$

Communication time $T(s, p)_{comm}$ is given through the number of performed communication operations in concrete parallel algorithm and depends from used decomposition model. To the practical illustration of communication overheads we used the possible matrix decomposition models.

5. Decomposition of matrix models

In general we are considering the typical possible decomposition strategies in following matrix

$$A = \begin{pmatrix} a_{11}, & a_{12}, & \ldots & , a_{1n} \\ a_{21}, & a_{22}, & \ldots & , a_{2n} \\ \vdots & \vdots & & \vdots \\ a_{m1}, & a_{m2}, & \ldots & , a_{mn} \end{pmatrix}$$

In order to achieve effective parallel algorithm it is necessary to map every parallel process more than one matrix element. Then for mapping a cluster of matrix elements there are in principal two ways

- mapping of square blocks to every parallel process as illustrated at Fig. 4.
- mapping of p columns or p rows.

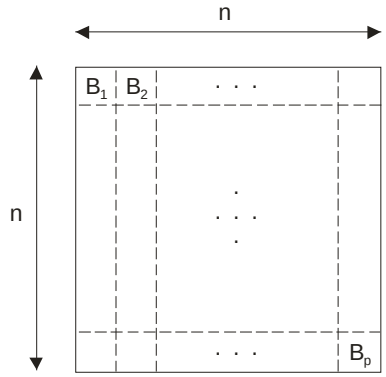

Fig. 4. Decomposition strategy to blocks.

Depending of used decomposition methods there are derived needed communication activities. In general square matrix in two dimensions in halts n^2 elements (complexity for sequential algorithm, which are equally divided to p build parallel processes, that means every parallel process gets n^2 / p elements. In order to achieve effective parallel algorithm it is necessary to map every parallel process more than one matrix element. Then for mapping a cluster of matrix elements there are in principal two ways

- mapping of square blocks to every parallel process as illustrated at Fig. 4.
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5.1. Matrix decomposition to blocks

For mapping matrix elements in blocks a inter process communication is performed on the four neighbouring edges of blocks (Fig. 5.), which it is necessary in computation flow to exchange. Every parallel process therefore sends four messages and in the same way they receive four messages at the end of every calculation step supposing that all needed data at every edge are sent as a part of any message).

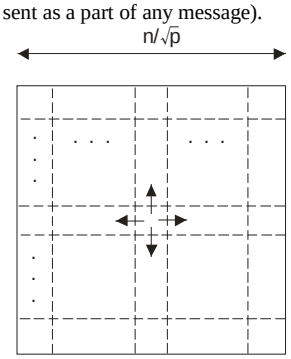

Fig. 5. Communication consequences for decomposition to blocks.

Then the requested communication time for this decomposition method is given as

$$T_{comb} = 8\,(t_s + \frac{n}{\sqrt{p}}\,t_w)$$

where

- t_s - is a start up time (time to initialise a communication)
- t_w - characterise needed time to transmit one word of message.

Graphical explanation of used communication parameters illustrates Fig. 5.

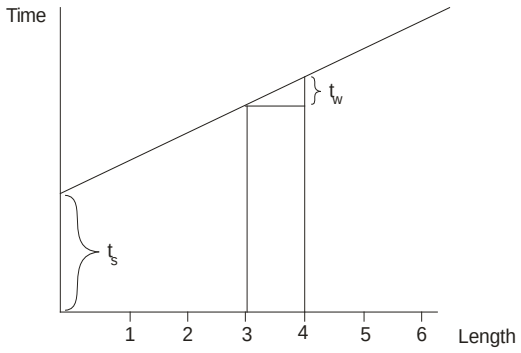

Fig. 5. Illustration of communication parameters.

This equation is correct for $p \geq 9$, because only under this assumption it is possible to build at least one square because only then is possible to build one square block with for communication edges. Using these variables for the communication overheads in decomposition method to blocks is correct

$$T(s,p)_{comm} = T_{comb} = h(s,p) = 8\,(t_s + \frac{n}{\sqrt{p}}\,t_w)$$

5.2. Isoeffectivity function

In the process of deriving needed isoeffectivity function we come out from derived function h(s, p) for analysed decomposition method as $h(s,p) = T_{comb}$ according the relation

$$T_{comb} = 8\,(t_s + \frac{n}{\sqrt{p}}\,t_w)$$

After appropriate modifications we get for isoefficiency following final relations

$$w(s)_{bloky} = \max\left[8\,C\,p\,\frac{t_s}{t_c}, 8\,C\,n\sqrt{p}\,\frac{t_w}{t_c}\right]$$

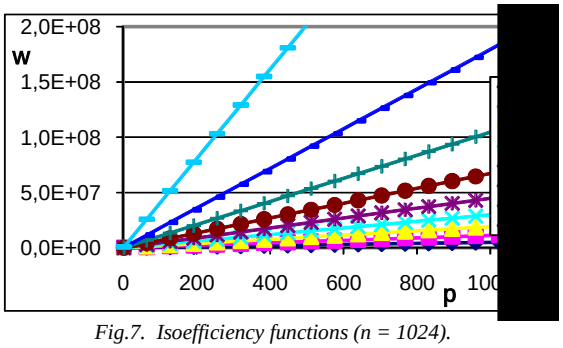

Fig.7. Isoefficiency functions (n = 1024).

Fig. 7. illustrate isoefficiency functions for individual constant values of effectivity (E = 0,1 až 0,9) for n = 1024 using the communication constants of parallel computer Cray T3E (t_s = 3 µs, t_w = 0,063 µs).

6. Conclusions

Performance evaluation as a discipline has repeatedly proved to be critical for design and successful use of operating systems. At the early stage of design, performance models can be used to project the system scalability and evaluate design alternatives. At the production stage, performance evaluation methodologies can be used to detect bottlenecks and subsequently suggests ways to alleviate them. Queueing networks and Petri nets models, simulation, experimental measurements, and hybrid modelling have been successfully used for the evaluation of system components. Via the extended form of isoefficiency concept for parallel algorithms we illustrated its concrete using to predicate the performance of typical matrix parallel algorithms. Based on derived issoeficiency function for matrix model the paper deals with the actual role of performance prediction in parallel algorithms. Due to the dominant using of parallel computers based on the standard PC in form of NOW and their massively integration named as Grid (integration of many NOW), there has been great interest in performance prediction of parallel algorithms in order to achieve optimised parallel algorithms (Effective parallel algorithms). Therefore this paper summarises the used methods for complexity analysis which can be applicable to all types of parallel computers (supercomputer, NOW, Grid). Although the use of NOW and Grid parallel computers should be in some parallel algorithms less effective than the in the world used massively parallel architectures (Supercomputers) the parallel computers based on NOW and Grid belong nowadays to dominant parallel computers.

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Primary Paper Section: I

Secondary Paper Section: IN, JC, JD

EFFICIENT TRANSFORMATION OF USE CASE MAIN SUCCESS SCENARIO STEPS INTO BUSSINESS OBJECT RELATION (BORM) DIAGRAMS FOR EFFECTIVE BUSSINESS PROCESS REQUIREMENT ANALYSIS

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Abstract: The basic part of an innovative and modern approach to business process requirement analysis which is based on the simultaneous utilization of UML Use Case approach and the Business Object Relation Modelling approach is analyzed in the present paper. Precisely the transition rules by which the Use Case Main Success Scenario steps are converted into to a BORM diagram, entitled as the Use Case To BORM Transformation Algorithm (UCBTA) transition rules, are presented as a pattern based method which leads to the effective and efficient business process requirement analysis.

Key words: Business process requirement Analysis, UCBTA Algorithm, UCBTA Transition Rules, Use Case Main Success Scenario Steps, BORM Diagrams

Introduction

The most common technique utilized worldwide for detailed requirement analysis is the UML Use Case model. Use Cases are often the foundation of most Object –Oriented development methods [3]. However, it has been stated by IT experts, who strongly recommend UML tools such as Use Case diagrams followed by the Sequence, Collaboration and State Transition Diagrams for the integration of efficient and effective requirement analysis, that the above mentioned tools are mainly oriented at the programming concepts and are regarded as weak [2] in terms of business logic and business process modelling. Provided that stakeholders are not familiar with computer – oriented concepts, communication between IT experts and stakeholders cannot be achieved at the early stages of system development and throughout requirement analysis phase. BORM methodology [4] on the other hand can be successfully utilized in this circumstance while it is business oriented, and it can be consequently absorbed by stakeholders and end users. In BORM diagrams the business process flow is depicted; consequently it can be viewed, controlled and absorbed at a satisfactory level, even by end – users and stakeholders who have no computer orientation. The author's proposal for the derivation of a complete business process requirement analysis is the transformation of the Use Case requirement analysis to the BORM approach with the introduction of a pattern based algorithmic method ***(Fig.1)***; the *Use Case to BORM Transformation Algorithm (UCBTA)* [5] is constructed to cover all possible weaknesses that emerge from the Use Case model and the BORM method when they are utilized solely and not simultaneously for defining and analyzing end – user requirements during the requirement analysis of a business process. The mathematical theory behind UCBTA algorithm is the *Non – Deterministic Finite Automaton* [1]. The UCBTA algorithm is comprised of several steps [5]. Throughout the current document the algorithmic phase analyzed is the transition of the Use Case main success scenario to a BORM diagram which aims at the workflow demonstration to the end users of a system or application.

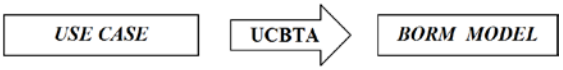

Fig. 1 The General Schema of the UCBTA Algorithm

Objectives and Methodology

Primary objectives of the current paper are:

- the justification of the construction of indispensible specified transition rules according to which the Use Case requirement analysis model is transformed to the BORM approach to business process requirement analysis without data loss
- demonstration of the way according to which Use Case main success scenario steps are demonstrated via BORM Diagrams after the transition is completed
- practical proof that the UCBTA transition rules are the most important part of the UCBTA transformation, due to the fact that end users with no IT background from any business process area are able to absorb the business process functionality.

The root methodologies from which the Use Case To BORM Transformation algorithm stems are the Use Case analysis and the BORM business process requirement analysis.

Discussion - UCBTA Transition Rules

Transformation models are inadequate in the case that part of data is lost during the execution of the transition from the one model to the other. For the precise comprehension of how data loss is eliminated during the transformation of the Use Case Model to the BORM business process requirement analysis approach, the author's concept is based on the creation of specific regulations that cover all the cases according to which the Use Case Main Success Scenario comprised of steps and sub steps is converted to BORM data flows, states and activities. Throughout the sections that follow the above mentioned regulations called UCBTA Transition Rules are analyzed in detail.

Basic UCBTA Transition rule

The basic type of the UCBTA transition rules comprises of the core transition from the Use Case Model to the BORM Business Process model. Throughout the core UCBTA transition, it is depicted how precisely a basic Use Case step of the main success scenario is diagrammatically adjusted to the BORM approach and represented by the BORM Process – Participant interaction model. The Process – Participant interaction model is also entitled as BORM Diagram. In the case that the above mentioned basic main success scenario Use Case step is divided into several sub steps the constructed BORM Diagram includes the aforementioned sub steps as well as they are described throughout the BORM method.
Let us assume a delineated Process and its corresponding Use Case A. The Use Case analysis also involves actors who take part in the process and are defined as Actor A and Actor B who are expressed as participants in BORM. Moreover, the Use Case step of the main success scenario is defined in the following way:

1. Actor A sends message to Actor B

The aforementioned step is supposed to be comprised of the following *sub steps* as well:
1a) Actor A expects reply
1b) Actor B receives message
1c) Message received by Actor B

The main goal is the transformation of the above written step and its subs steps to BORM activities flows and states, without any loss of data.

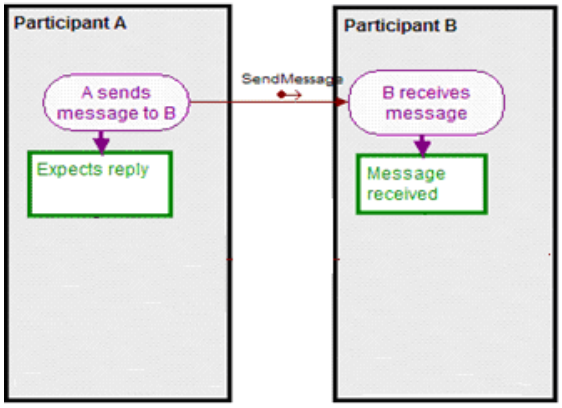

Fig. 2 BORM aspect of Process A after Primary UCBTA transition

As it can be noticed by the reader, the main success scenario step is the corresponding BORM activity which is considered to be the starting point of the data flow. The activity that belongs to the participant who receives the message and the two states are considered to be the Use Case sub steps of the above mentioned step. The currently defined rule is the basis on which the following 3 rules are constructed.

Primary or Initial Step UCBTA Transition rule

The second type of the analyzed rules of the Use Case transition to BORM is the Primary UCBTA Transition. Throughout the primary transition it is explained by the author how the Initial and the second step of the main success scenario are transformed to BORM activities, states and data flows.
The delineation of the primary transition is initiated with the assumption that UCBTA requirement analysis has to be performed for Process A. It is also assumed that the corresponding Use Case which is related to the aforementioned process is Use Case A.
The Use Case analysis also involves actors who take part in the process and are defined as Actor A and Actor B who are expressed as participants in BORM. Moreover, the initial and the second step of the main success scenario are defined in the following way:

1. Actor A sends message to Actor B
2. Actor B sends reply message to Actor A

Considering the initial step of the main success scenario the sub steps involved are:

1a) Actor A expects reply
1b) Actor B receives message
1c) Message received by Actor B
2a) Actor B expects new info message
2b) Actor A receives reply
2c) Reply message is received by Actor A

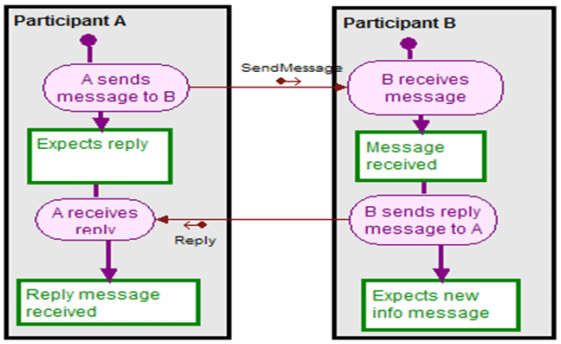

Fig.3 BORM aspect of Process A after Primary UCBTA transition

Middle Step UCBTA transition

The second type regarding the UCBTA Transition rules is the Middle Step UCBTA transition. The specific type follows exactly the same transformation path as the Primary UCBTA transition type; the main difference due to which the two types are distinguished is the fact that the Middle transition type refers to middle Use Case steps.

Supposing that the UCBTA requirement analysis should be implemented for a defined Process B. As in the case of the first transition type, its corresponding Use Case B is defined as well. An additive assumption is that the Use Case Steps of which the analyzed Use Case main success scenario is comprised is n, where $n \in N^*$.

The Middle UCBTA Transition rule is applied for steps k and k+1, where $2<k<n$, $k+1 < n$ and $k, n \in N^*$. The steps and sub steps of the main success scenario will be defined in the same way as in the primary UCBTA transition rule, and the BORM aspect is depicted (***Fig.4***) the BORM Diagram. It can be noticed that the difference with the first rule is that the middle step transition in BORM is without starting or ending points.

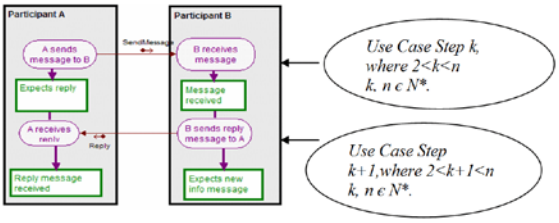

Fig. 4 BORM aspect of Process B after Middle Step UCBTA transition

Conditional UCBTA Transition Rule

The final type of the analyzed rules of the Use Case transition to BORM is the Conditional UCBTA Transition. The specified UCBTA transition rule is based on the fact that one or more steps of the Use Case main success scenario could lead the process in many different states.

1. Actor A sends message to Actor B
2. Actor B replies to Actor A, if the message is recognized
3. Actor B rejects message, if message is not recognized, and procedure terminates

Considering the initial step of the main success scenario the sub steps involved are:

1a) Actor A expects reply
1b) Actor B receives message
1c) Message received by Actor B

In the same way the second step includes the following sub steps:

2a) Actor B expects new info message
2b) Actor A receives reply
2c) Reply message is received by Actor A

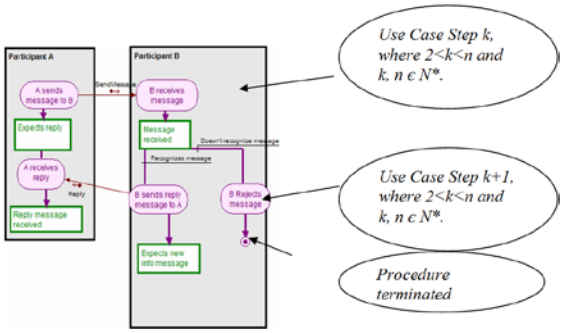

Fig. 5 BORM aspect of Process C after Conditional UCBTA transition

Conclusion

The most critical phase of the application or system development is the requirement analysis phase. Throughout the concrete phase the business needs of the end users are defined and analyzed by the IT experts. The most significant of the Object – Oriented methodologies to requirement analysis, named as Use Case analysis, is not adequate for that purpose if it is not followed by an equally tested and pure Object – Oriented approach; the concrete approach is the Business Object Relation Modeling (BORM). For the above stated reason the Use Case to BORM Transformation Algorithm (UCBTA) is introduced as a complete solution to perorm efficient business process requirement analysis. The most important part of the transition from the Use Case model to the BORM approach to requirement analysis is the creation of specific rules that cover all the cases according to which the Use Case Main Success Scenario comprised of steps and sub steps is converted to BORM data flows, states and activities and as a result data loss is eliminated and end users utterly comprehend the business process functionality.

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Primary paper section: I

Secondary paper section: IN

COMPUTER LITERACY AND MOTIVATION FOR CONTINUED EDUCATION – RESEARCH IN 2011 BY COMPARISON WITH 2010

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The article deals with the results of the research conducted in 2011 with the support of the specific research entitled "Research of computer literacy amongst persons over 30", under number 2131 and the specific research from 2010 entitled "Research of computer literacy amongst persons over 40", under number 2132. Both the researches were approved at the University in Hradec Králové.

Abstract: In 2011 a questionnaire survey took place to verify computer literacy in persons over the age of 30. The questionnaire survey also was to identify the respondents' motivation for upgrading. The paper aims to summarize the results compiled in the area of computer literacy as well as motivation for upgrading. A view of computer literacy as well as motivation for upgrading has been elaborated by age category, education level achieved, gender, size of place of residence, and distance of permanent residence from the regional capital. Furthermore, the paper mentions the results of the respondents' answers to questions concerning computer literacy and their evaluation, as to how they manage to work with the computer. The paper also presents the respondents' interest in study subjects and weekly timetable for their study program.

Keywords: Questionnaire survey, adult education, willingness to upgrade, computer literacy.

Computer literacy and motivation for upgrading of persons over 30 years of age is important for all types of education, be it professional education or upgrading, or education of seniors. The objective of the paper is to acquaint the public with the results of a research of the motivation for upgrading and computer literacy in individual age categories.

Present Knowledge of the Field

Many authors are engaged in the improvement of computer literacy in adults and also seniors. Bakaev, Ponomarev, and Prokhorova (2008) confirm a well-known fact: it is necessary in the field of adult education and especially senior education to overcome certain obstacles in the early stages. After that students are able to improve their computer related knowledge significantly. The authors of the paper introduced methodological approach in courses of computer literacy with 110 Russian seniors. The courses contributed to an extensive improvement in computer literacy (38% to 81%) and Internet skills (21% to 62%) in seniors. The authors emphasize that the communication skills of the lecturers are of cardinal importance in the educational process. This conclusion corresponds with the observations of Lau and Cortes (2009) who explored the relation between information and communication in detail.

Gagliardi et al. (2008) provide a practical guide for improving computer skills in seniors and disabled people. The authors deal with the analysis of focused perception of organizational and didactic aspects in teachers to facilitate the improvement of the students´ skills. A statistically important relationship was identified between the initial education level of the students and the overall responsiveness and satisfactory pace in the courses. The relationship found became a basis for a discussion of the authors about appropriate educational methods supporting computer literacy.

The personal profile of the adults who try to improve their computer literacy seems to be crucial for the efficiency and success of computer literacy courses. Burger and Blignaut (2007) even suggest the way to anticipate the computer literacy course result according to the student's personal characteristics. The authors studied several biographic, psychological and cognitive factors and identified their impact on the qualification of such courses for individual groups of adults.

According to Langmeier's development psychology (2006), the phases of the development of adults are as follows:

1. **Early adulthood** (approx. From the age of 20 to 25 – 30 years) is a temporary stage between adolescence and full adulthood.
2. **Mid-adulthood** (approx. Up to the age of 45 years) is a phase of full productivity and relative stability.
3. **Late adulthood** is the phase up to the beginning of old age (i.e. approx. up to the age of 60 – 65 years).
4. **Old age** (which can be further classified into early and late).

In the old-age group, sensual perceptibility and memory deteriorate, according to Langmeier (2006), p. 204. As far as sensual perceptibility is concerned, roughly 90% persons over 60 lose some visual perceptibility, and 30 % persons suffer from significant hearing deterioration. This meaningfully inhibits their work capability, but also recreational options, and thus also adult education options. Their memory becomes worse, primarily in the area of short-term memory for new events, while long-bygone events remain logged well in their memory. At a higher age, intelligence also declines, according to results obtained by common intelligence tests, e.g., the Wechsler test, as Langmeier mentions. These changes, too, affect man's chances for further education, although the differences between individuals can be considerable.

When examining the developmental stages according to Vágnerová (2007), we obtain the following phases:

1. Junior adulthood phase (20 – 40 years of age)
2. Mid-adulthood phase (40 – 50 years of age)
3. Senior adulthood phase (50 – 60 years of age)
4. Early old-age phase (60 – 75 years of age)
5. Genuine old-age phase (75 of age and older)

"Due to the various changes accountable to aging, human brain processes certain information differently from before. While younger people usually have to activate merely a specialized part of their brain to resolve certain problems, the brain of older persons functions in a more complex manner. Various research efforts confirm that different parts of the brain engage in the solution-finding process in young and older individuals. This difference can be viewed as one of the functionality phenomena known as plasticity, which is the human brain's way of compensating for deterioration of brain functionality. In persons over 60 years of age, we observe bilateral actuation of relevant brain centres, whereas in younger persons only certain unilateral areas of the brain are active (e.g., when recalling information and solving tasks involving verbal or spatial memory). In older persons, certain functions are no longer as clearly lateralized as before. Instead, both hemispheres are actuated as part of physiological compensation. This might change their functional integrity (Berger and Thompson, 1998; Stuart-Hamilton, 1999; Baltes, Freund and Li, 2005; West and Bowry, 2005)." Vágnerová (2007).

As you might notice yourselves, two specialists working in developmental psychology differ in the way they differentiate individual stages of development and determine the age brackets of such development. On the other hand, they agree on many of the changes that take place due to aging of the population.

Demographic Classification of the Survey Sample

The aim of the research in 2011 was to identify the degree of computer literacy and motivation for upgrading of the population over 30 years of age. This paper aims to compare the results acquired from the research in 2011 with the results of the questionnaire survey conducted in 2010. In the spring of 2010, a questionnaire survey took place to evaluate the computer literacy of persons over 30 years of age. In 2011 a verifying questionnaire survey was carried out. In the month of April, 4,000 questionnaires were handed out thanks to the help of 250 students of the College of Polytechnics in Jihlava, in which respondents expressed their opinions in three thematic areas. Most of the questions were prepared in the multiple-choice-answers form. In 2011 approximately 200 students of the

College of Polytechnics in Jihlava helped with the research. 4,000 questionnaires were handed out again.
The first part of the questionnaire in 2010 and the second part in 2011 aimed to identify the respondents' elementary demographic characteristics for the purposes of subsequent differentiation into groups of respondents and analyzing their answers. The following personal data were recorded: gender, age, education, place of residence, distance from regional capital, and current occupation.
The second part of the questionnaire in 2010 and the third part in 2011 aimed to assess the respondents' motivation for upgrading. For respondents who wished to enrol in adult education classes we tried to find a suitable field of specialty (i.e., demand for educational opportunities) and the time that the respondents were willing to devote to learning and, last but not least, the distance they were willing to travel to attend classes.
As far as the response rate of the questionnaires is concerned, 3,258 of them, out of 4,000, returned to us for processing in 2010. This brings the response rate to 81%, which is – from methodological point of view – a very positive result. After discarding incomplete and wrongly filled-in questionnaires, we had 2,537 respondents left to work with. In 2011, 3,072 questionnaires, out of the total number of 4,000, returned to us for processing, which brings the response rate nearly to 77%. From the methodological point of view, the response rate over 80% would be better but even the result of 77% seems to be sufficient for verifying the preceding survey. After discarding incomplete and wrongly filled-in questionnaires, we had 2,577 respondents left to work with. This presents a better result as compared with 2010. More respondents filled in the questionnaire correctly than in the preceding year, although the difference makes only 1% of the total number of questionnaires handed out.
If we examine the demographical distribution of the respondents in our survey sample, we can state the following findings: the sample of respondents in 2010 consisted of 55.22% women and 44.78% men, whereby the largest age group was represented by age group 40 to 44 years and from the point of view of education the largest group comprised graduates of secondary schools. The sample of respondents in 2011 consisted of 54.67% women and 45.33% men, whereby the largest age group was again represented by age group 40 to 44 years and from the point of view of education the largest group again comprised graduates of secondary schools. The exact distribution by the above demographical determinants is reflected in the following table.

Table 1 – Respondents by Age

Age	Percentage of respondents in 2010	Percentage of respondents in 2011
30 – 39	12.73%	14.4%
40 – 44	23.49%	25.34%
45 – 49	22.23%	22.98%
50 – 54	14.74%	15.74%
55 – 60	10.25%	7.99%
60 – 64	6.23%	4.57%
65 – 69	4.85%	4.68%
70 – 74	3.19%	2.20%
75 +	2.29%	2.01%

Source: own research

The comparison of the two years shows that the respondents of 2011 were younger. The willingness of older students to fill in the questionnaires was not as high as in 2010.

Table 2 – Respondents by Education

Education level achieved	Percentage of respondents in 2010	Percentage of respondents in 2011
Elementary	4.41%	2.76%
Vocational training	34.25%	32.91%
High school with graduation	39.57%	43.33%
University – bachelor's degree	6.54%	7.42%
University – master's degree	12.38%	12.04%
University – doctor's degree	2.72%	1.42%
Higher professional school	0.12%	0.12%

Source: own research

In 2011, the number of respondents with high school education with graduation and with bachelor's degree from universities increased. This fact indicates a shift in education achieved in the Czech Republic.
When considering the sample of respondents from the point of view of their place of residence, the highest number of respondents in 2010 belonged to the category village/town/city with the population of up to 9.999 inhabitants. This group was followed by inhabitants of regional capitals and another numerous group of respondents lived 21 to 30 km from the regional capital. In 2011 the highest number of respondents also belonged to the category village/town/city with the population of up to 9.999 inhabitants. This group was followed by respondents who lived 21 to 30 km from the regional capital. The exact data is again presented in the two following tables.

Table 3 – Respondents by Place of Residence

Place of residence is a village/town/city with the population of:	Percentage of respondents in 2010	Percentage of respondents in 2011
0 – 9.999	45.92%	45.97%
10.000 – 19.999	17.70%	15.51%
20.000 – 29.999	10.60%	11.24%
30.000 – 39.999	4.85%	6.54%
40.000 – 49.999	8.36%	7.09%
50.000 – 59.999	8.32%	9.91%
60.000 and more	4.26%	3.76%

Source: own research

Table 4 – Respondents by Distance from Regional Capital

Place of residence distance from the regional capital	Percentage of respondents in 2010	Percentage of respondents in 2011
place of residence in the regional capital	21.80%	18.38%
1 - 10 km	8.47%	8.39%
11 – 20 km	14.70%	15.16%
21 – 30 km	16.71%	19.98%
31 – 40 km	14.31%	16.34%
41 – 50 km	11.39%	10.82%
more than 50 km	12.61%	10.93%

Source: own research

In 2011, the groups "place of residence in the regional capital" and "place of residence 21 – 30 km from the regional capital exchanged their positions in terms of quantity. The other groups are similar to the research in 2010, although there was either a slight decrease or increase ranging up to two percent.
We examined the relevance of data from the perspective of official data stated in the public database of the Czech Statistical Office (www.czso.cz). The distribution of the respondents in both researches corresponds to the distribution of men and women in the Czech Republic as per the Czech Statistical Office. According to the website of the Czech Statistical Office, each age category represents roughly 10% of the population for persons over 30 years of age. From the age of 65 up, the percentage of these persons in total population begins to decline. The questionnaire survey corroborated the figures reported by the Czech Statistical Office, except that there were more respondents in age categories from 40 to 50 years than their percentage in these age categories reported by the Czech Statistical Office. The aforesaid is again applicable to both of the researches.

Results and Discussion – Motivation for Upgrading in 2010 and 2011

The following text analyses the willingness (motivation) of the respondents to enrol in adult education programs. The data analysis from 2010 shows that 56% respondents are willing to upgrade in their free time, on the other hand, 44% respondents are not interested in upgrading. The number of respondents willing to upgrade decreased in 2011. 55% respondents are willing to upgrade, 45% respondents are not. This one-percentage decrease in interest might be caused by the overall situation in the society. Although in terms of the present economic crisis people should be more interested in upgrading to enhance their chances to find a job at the time of unemployment. From the point of view of employment, people should upgrade to become more beneficial for the society.

If we examine the sample of respondents who are interested in further education by gender, we see that women are more motivated (59% of them expressed to be motivated in 2010) as opposed to men (53% in 2010). The research of 2011 indicates a decrease of motivation for further education. In both the categories the motivation decreased by 5%. Further researches might verify this downward trend. I hope, from the professional point of view, that this was only an exception. From the point of view of adult education, it would be desirable if the respondents were more willing to upgrade, otherwise the efforts of education experts would have little effects, and that would be a big loss nowadays.

Although these figures cannot be considered statistically meaningful, there are certain gender-specific motivation differences. Even more interesting is the information that relates to individual age groups. As for the research of 2010, in the individual age groups of up to 70 years, greater motivation for learning can be found in women, in the age group of over 70, the survey showed results in favour of men. In the research of 2011 the greater motivation for learning in most age groups can also be found in women. The only difference occurred in the age group of 55 to 59 let, when men were more motivated to study in 2011. This might be caused by the fact that men realize, because of later retirement, the necessity to upgrade to find a new job in case they are unemployed and thus to fulfil themselves on the job market.

The above mentioned result for 2010 is comprehensively presented in the following graph.

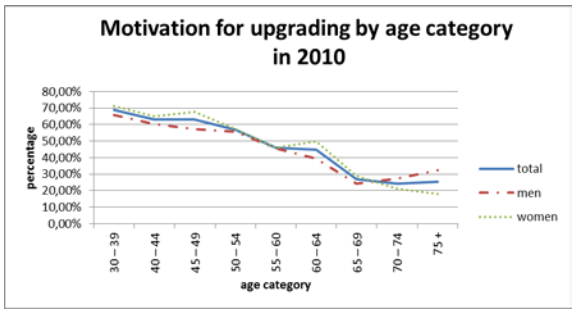

Figure 1 – Motivation for upgrading by age category in 2010
Source: own research

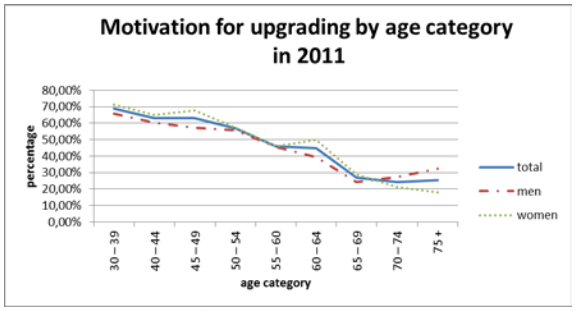

Figure 2 – Motivation for upgrading by age category in 2011
Source: own research

The graphs presented above indicate clearly that willingness for further education decreases with increasing age of the respondents and depending on the developmental stage of an adult person, as described by specialists in developmental psychology.

We have to realize that the results of the research correspond to the developmental stages of man, where certain cognitive changes occur in the individual phases and motivation for upgrading changes in correlation to these changes.

If we interpret the results from the perspective of gender, age, and highest level of education achieved, then we find that in the category of men who would like to upgrade their education were predominantly respondents with tertiary education. Only the group aged 60 - 69 years was distinctly different from the other age groups. The category of women is similar – female respondents with tertiary education have greater motivation to learn.

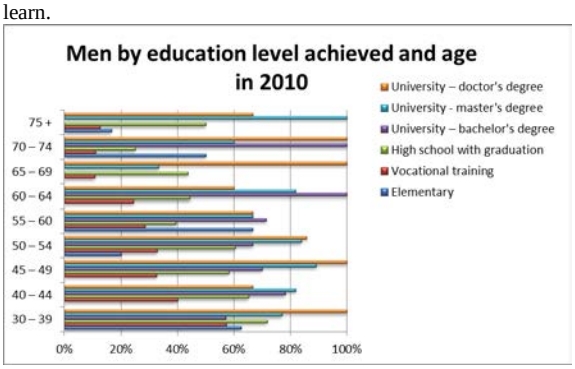

Figure 3 – Motivation for upgrading in case of men by education level achieved and age – research of 2010
Source: own research

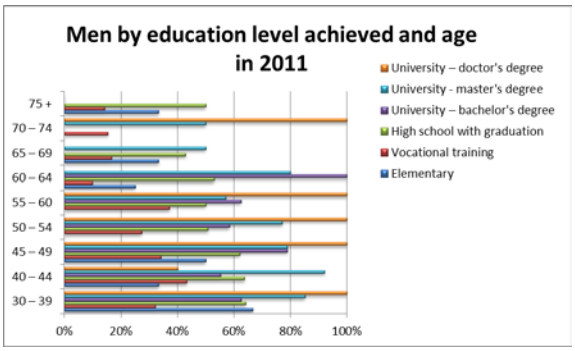

Figure 4 – Motivation for upgrading in case of men by education level achieved and age – research of 2011
Source: own research

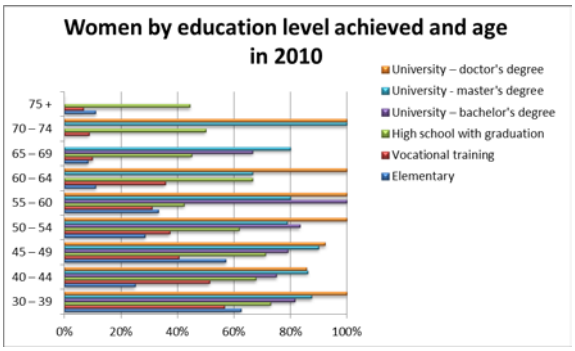

Figure 5 – Motivation for upgrading in case of women by education level achieved and age - research of 2010
Source: own research

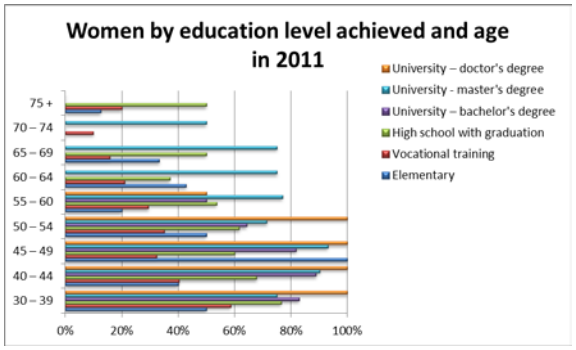

Figure 6 – Motivation for upgrading in case of women by education level achieved and age - research of 2011
Source: own research

If we examined the motivation phenomenon in the light of this distribution by age category, we find that greater motivation for upgrading – at this level of education hitherto completed – is on the part of the younger rather than the older age categories. Again, this finding is corroborated by individual changes in the developmental stages of the respondents. The intelligence of the younger age categories is, according to specialized research, is higher and so is their memory capacity. Hence, these respondents are more willing to attend adult education programs. Persons in the older age categories are more fearful and apprehensive of the changes that impact on their lives and are therefore less motivated.
It is also highly interesting to look at the motivation for upgrading from the perspective of the place of residence, both concerning its size of population (table No.5) and its distance from the regional capital (table No.6).

Table 5 – Motivation for Upgrading by Place of Residence

Place of residence is a village/town/city with the population of:	Motivation for upgrading 2010	Motivation for upgrading 2011
0 – 9.999	47%	47%
10.000 – 49.999	41%	41%
50.000 – 59.999	8%	8%
60.000 and more	4%	4%

Source: own research

Here the results of the two surveys are completely the same. It is amazing that respondents with place of residence in a village/town with lower population are more interested in further education than respondents from larger towns/cities who have better opportunities for education than respondents from smaller towns and municipalities. The results of this survey might be influenced by the places where the researches were conducted. The researches in 2010 and 2011 were both carried out by students of the College of Polytechnics in Jihlava, and thus we could say that the majority of respondents probably come from the Vysočina Region, but it is not possible to state it clearly for the research of 2010. The reason is a wide range of the students' places of residence where the research was done. It is true that only a little percentage of students come from Prague or Brno. However, the distribution of individual regions can be traced in the research of 2011. It is true that nearly 65% respondents live in the Vysočina Region. Other regions, which are represented by 5% each, were the South Bohemian, South Moravian, central Bohemian and Pardubice Regions. This is obvious when we realize the location of the Vysočina Region and its neighbouring regions. Other regions, not mentioned above, are represented by small numbers lower than 1%.

Table 6 – Motivation for Upgrading by Distance from the Regional Capital

Place of residence distance from the regional capital	Motivation for upgrading 2010	Motivation for upgrading 2011
place of residence in the regional capital	22%	20%
1 - 10 km	8%	7%
11 – 20 km	15%	15%
21 – 30 km	17%	20%
31 – 40 km	14%	17%
41 – 50 km	11%	11%
More than 50 km	13%	10%

Source: own research

As the table No. 6 shows, distinctive motivation for further education is not related to the distance from the regional capital but it is distributed evenly in the area around the regional capital. The questionnaire survey also tracked the specialization that the respondents would like to study. Respondents could choose from multiple options. In some cases, they could fill in a specialization of their choice, if it was not offered in the questionnaire. The table below shows the number of respondents by specialization of their choice. If we want to examine the individual preferred specializations by gender, we have to look at Table No. 7.

Table 7 – Specialization of choice by category of men and women

Specialization	Men 2010	Women 2010	Men 2011	Women 2011
Technical (maths, physics)	81.94%	18.06%	83.17%	16.83%
Social	22.57%	77.43%	22.18%	77.44%
Historical	40.24%	59.76%	47.92%	51.39%
Artistic	25.71%	74.29%	32.53%	67.47%
Economic	41.31%	58.69%	40.58%	58.76%
Legal	54.03%	45.97%	38.13%	61.25%
Sports	57.63%	42.37%	55.56%	43.65%
Languages	36.23%	63.77%	39.41%	60.04%
Computers	49.67%	50.33%	51.04%	48.34%

Source: own research

If we focus on the specialization that they would wish to study, we find that the three most popular areas in both researches are: languages, computers, and economics. The least popular fields of specialty in 2010 were sports and law. The research of 2011 shows a decline in the interest in artistic specialization, so this was the least demanded specialization. The answers indicate which specializations are preferred by men and which by women. While men prefer technical subjects and sports, women prefer social subjects and creative arts in both researches.
There was a change in the willingness to study the legal specialization. In 2010, this specialization was favoured by men while in 2011 it was preferred by women. Lower or higher willingness to study any of the other specializations by gender groups remained the same in both researches, only the proportionate representation changed.
If we focus on the distance which the respondents are willing to travel, the majority of respondents opted for the distance of 20 km in both researches. The second most frequent answer was 50 km in the research of 2010 and 30 km in the research of 2011. The third most frequent answer was 30 km in the research of 2010 and 10 km and 50 km in the research of 2011. The respondents manifested different attitude to commuting for education. Some respondents, despite of the fact that they live in a small village, are not willing to commute because of education. They would prefer to study in their place of residence, which is usually much more complicated.

Table 8 – Optional length of studies with an educational institution

How much time would you be willing to spend doing your studies at the institution?	Men 2010	Women 2010	Men 2011	Women 2011
Less than 1 hour per week	7.72%	5.96%	8.20%	7.77%
1 to 2 hours per week	52.01%	56.02%	52.79%	51.97%
More than 2 hours per week	36.11%	34.98%	33.59%	34.92%
Other time limit	4.17%	3.04%	5.42%	5.34%

Source: own research

Furthermore, the questionnaire survey examined the length of study that the respondents would be willing to spend at the educational institution. Table No. 8 shows the percentages for the categories of men and women.
As Table No. 8 clearly indicates, most respondents, both men and women, were willing to devote 1 to 2 hours a week. These findings are the same for both researches and might lead to generalization that the respondents find one to two hours a week the ideal time for further education. One third of the respondents are willing to spend on education more than two hours a week.

Results and discussion – computer literacy

The third part of the questionnaire survey of 2010 and the first part of the research of 2011 focused on the computer literacy of persons over 30 years of age. The results of 26 questions, with consideration given to the respondents' personal data, can be interpreted as follows. In this particular paper I limit my interpretation to several questions.
Question No. 1: "Do you know how to use a PC at least on a completely elementary level?" Answers: Yes, No.
The number of "Yes" answers was 85.17% in the research of 2010. The comparison of men and women indicates that women were a little more self-confident than men, and that more of them know how to use a PC on at least elementary level than men. From the perspective of age, younger respondents were more self-confident, which clearly reflects the trend of the time, where the younger generation is likely to be more technically inclined than the older generation. If we examine this phenomenon from the perspective of education and age, we can see it best in the following graph, see Fig. 7. Most of the self-confident respondents were amongst the university-educated with bachelor's degree aged 40 to 44 years.
In the research of 2011, the number of "Yes" answers was already 89.75%. This time men were more self-confident than women but the difference in percentage representation was not significant. From the perspective of age, the research verified the result of 2010 that younger respondents were more self-confident in using a PC. An interesting change occurred in 2011 in the groups of respondents who achieved university education with bachelor's degree and those who achieved only elementary education. These two education groups were more self-confident after the age of fifty but each in a different way, see Fig. 8.

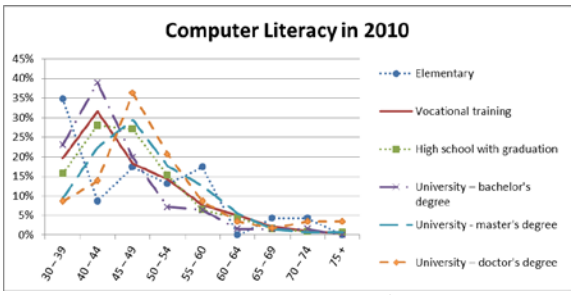

Figure 7 – Computer literacy – research of 2010
Source: own research

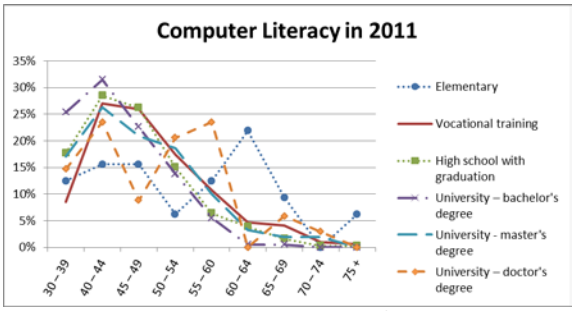

Figure 8 - Computer literacy – research of 2011
Source: own research

Question No. 12: "Do you have at least some idea what a hard disk is and what it is used for?"
Answers: Yes, No.
76.05% respondents answered "Yes" in 2010 and 78.95% respondents answered "Yes" in 2011. Their exact differentiation by gender is shown in Table No. 9.

Table 9 – Answers to question: "Do you have at least some idea what a hard disk is and what it is used for?"

	2010		2011	
	Yes	No	Yes	No
Total	76.05%	23.95%	78.95%	21.05%
Men	80.59%	19.41%	81.42%	18.58%
Women	72.38%	27.62%	77.34%	22.66%

Source: own research

If we examine the data obtained from the answers to this question from the perspective of education and age, it is interesting to see the results deriving from answer "No", where respondents with elementary and vocational education do not have an idea what a hard disk is. Results in the categories of education (elementary, vocational) and age, by gender are shown in Fig. No. 9 for the research of 2010 and Fig. No. 10 for the research of 2011.

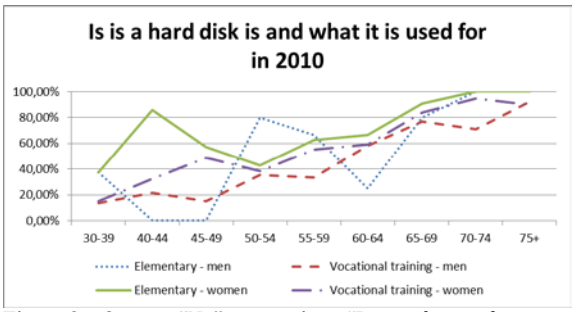

Figure 9 – Answer "No" to question : "Do you have at least some idea what a hard disk is and what it is used for?"
Source: own research

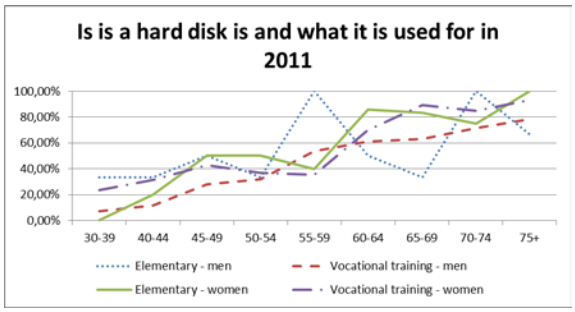

Figure 10 – Answer "No" to question : "Do you have at least some idea what a hard disk is and what it is used for?" Source: own research

Question No. 13: "Do you have at least some idea how to find a file on the disk?" Answers: Yes, No.
75.94% respondents answered "Yes" in 2010 and 80.48% respondents answered "Yes" in 2011. Their exact differentiation by gender is shown in Table No. 10.

Table 10 – Answers to question: "Do you have at least some idea how to find a file on the disk?"

	2010		2011	
	Yes	No	Yes	No
Total	75.94%	24.06%	80.48%	19.52%
Men	78.13%	21.87%	83.16%	16.84%
Women	74.17%	25.83%	78.51%	21.49%

Source: own research

If we examine the data obtained from the answers to this question from the perspective of education and age, it is interesting to see the results deriving from answer "No", where respondents with elementary, vocational and vocational with graduation education do not have an idea how to find a file in the computer. Results in the categories of education (elementary, vocational, vocational with graduation) and age, by gender are shown in Fig. No. 11 for the research of 2010 and Fig. No. 12 for the research of 2011.

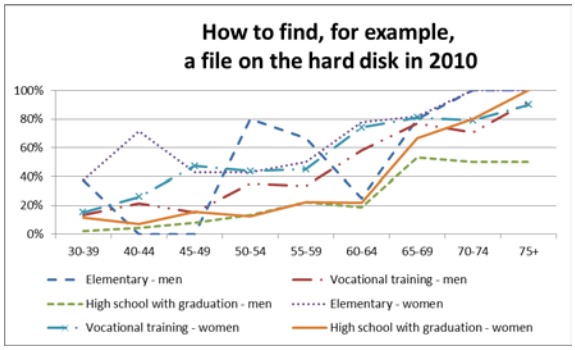

Figure 11 – Answer "No" to question: "Do you have at least some idea how to find a file on the disk?"
Source: own research

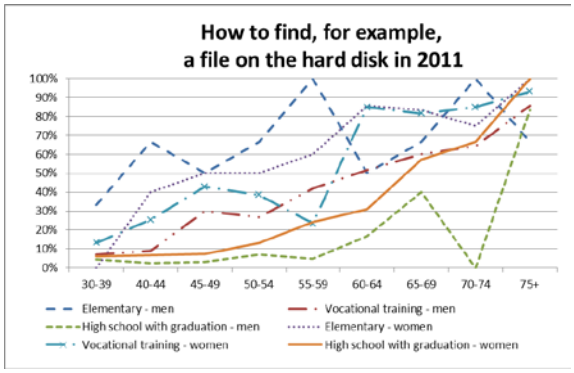

Figure 12 – Answer "No" to question: "Do you have at least some idea how to find a file on the disk?"
Source: own research

Question No. 14: "Do you know how to work with a program for text editing, so-called text editor (e.g., Word, WordPerfect, Text602 etc.)?"
Answers: Yes; Yes, partly; No, not at all.
41.29% respondents answered "Yes" in 2010 and 44.66% respondents answered "Yes" in 2011. Their exact differentiation by gender is shown in Table No. 11.

Table 11 – Answers to question: "Do you know how to work with a program for text editing, so-called text editor (e.g., Word, WordPerfect, Text602 etc.)?"

	2010			2011		
	Total	Men	Women	Total	Men	Women
Yes	41.29%	45.30%	38.05%	44.66%	48.31%	41.73%
Yes, partly	33.56%	30.94%	35.68%	35.41%	33.36%	37.27%
No	25.15%	23.76%	26.27%	19.93%	18.33%	21.01%

Source: own research

If we examine the data obtained to this question from the perspective of education and age, it is interesting to see the results deriving from the answer "No", where respondents with elementary and vocational education do not know how to work with text editing program. Results in categories education (elementary, vocational) and age, by gender, are shown in Fig. No. 13 for the research of 2010 and Fig. No. 14 for the research of 2011.

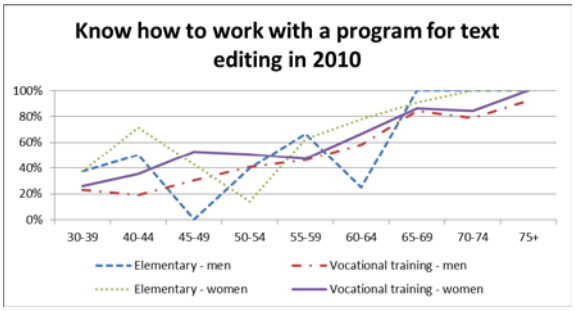

Figure 13 - Answer "No" to question: "Do you know how to work with a program for text editing, so-called text editor (e.g., Word, WordPerfect, Text602 etc.)?"
Source: own research

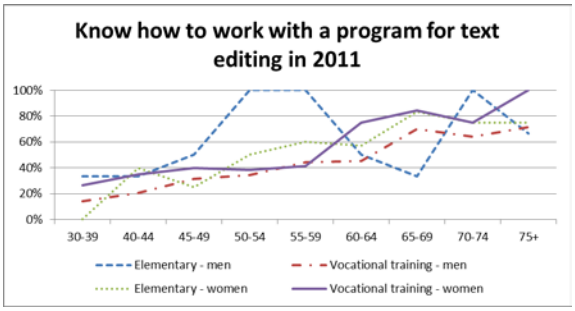

Figure 14 - Answer "No" to question: "Do you know how to work with a program for text editing, so-called text editor (e.g., Word, WordPerfect, Text602 etc.)?"

Source: own research

It is interesting how answers to this question changed. In the research from 2011, the answer "No" was peculiar to men with elementary education in the age groups from 50 to 60 years. In the research from 2010, however, only approximately 50% of the same group answered "No". Another change occurred in the age group over 70 years. In the research from 2010 most respondents from this group answered "No" while in 2011 only up to 50% respondents of the same group answered "No".

Question No. 17: "Do you know how to work with the Internet?"
Answers: Yes, no.
82.19% respondents in the research from 2010 and 86.00% respondents in the research from 2011 answered "Yes". Their exact differentiation by gender is shown in Table No. 12.

Table 12 – Answers to question: "Do you know how to work with the Internet?"

	2010			2011		
	Total	Men	Women	Total	Men	Women
Yes	82.19%	82.87%	81.64%	86.00%	86.81%	85.60%
No	17.81%	17.13%	18.36%	14.00%	13.19%	14.40%

Source: own research

If we examine the data obtained to this question from the perspective of education and age, it is interesting to see the results deriving from answer "No", where respondents with elementary and vocational education do not know how to work with the Internet. Results in categories education (elementary, vocational) and age, by gender are shown in Fig. No. 15 for the research of 2010 and in Fig. No. 16 for the research of 2011.

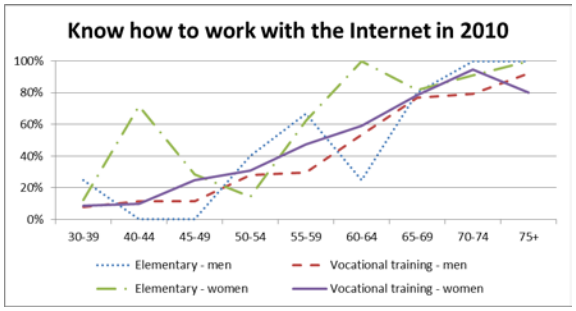

Figure 15 – Answer "No" to question: "Do you know how to work with the Internet?" Source: own research

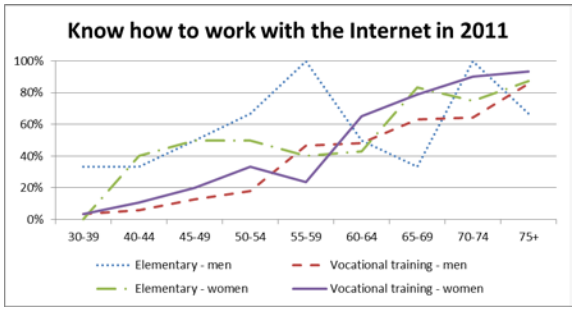

Figure 16 – Answer "No" to question: "Do you know how to work with the Internet?" Source: own research

Question No. 20: "Do you use a PC or laptop/notebook when not at work?"
Answers: Yes, actively, practically daily; Yes, but only occasionally; No, never when not at work.
43.73% respondents in the research from 2010 and 49.32% respondents in the research from 2011 answered "Yes, actively, practically daily". Their exact differentiation by gender is shown in Table No. 13.

Table 13 – Answers to question: "Do you use a PC or laptop/notebook when not at work?"

	2010			2011		
	Total	Men	Women	Total	Men	Women
Yes, daily	43.73%	49.59%	39.02%	49.32%	53.50%	46.07%
Yes, no daily	32.40%	28.08%	35.87%	34.77%	31.27%	37.64%
No	23.87%	22.33%	25.11%	15.91%	15.23%	16.29%

Source: own research

Question No. 21: "Do you use the Internet or e-mail when not at work?"
Answers: Yes, actively, practically daily; Yes, but only occasionally, No, never when not at work.
44.85% respondents in the research from 2010 and 54.86% respondents in the research from 2011 answered "Yes, actively, practically daily". Their exact differentiation by gender is shown in Table No. 14.

Table 14 – Answers to question "Do you use the Internet or e-mail when not at work?"

	2010			2011		
	Total	Men	Women	Total	Men	Women
Yes, daily	44.85%	49.22%	41.34%	54.86%	57.02%	53.11%
Yes, no daily	31.95%	28.58%	34.65%	30.87%	29.74%	31.90%
No	23.20%	22.19%	24.01%	14.27%	13.25%	14.98%

Source: own research

Question No. 22: "How often do you use computer?"
Answers: Daily, 1x up to 6x a week, 1x up to 3x a month, Less than 1x a month, Never.
43.64% respondents in the research from 2010 answered "Daily" and 47.56% in the research from 2011 also answered "Daily". Their exact differentiation by gender is shown in Table No. 15.

Table 15 – Answers to question "How often do you use computer?"

	2010			2011		
	Total	Men	Women	Total	Men	Women
Daily	43.64%	46.21%	41.57%	47.56%	50.48%	45.40%
1x up to 6x a week	24.99%	23.64%	26.08%	26.77%	26.32%	27.27%
1x up to 3x a month	12.36%	11.06%	13.40%	12.37%	11.73%	12.81%
Less than 1x a month	4.03%	4.46%	3.67%	4.21%	3.74%	4.68%
Never	14.99%	14.63%	15.27%	9.09%	7.73%	9.86%

Source: own research

Question No. 23: "How often do you use the Internet?"
Answers: Daily, 1x up to 6x a week, 1x up to 3x a month, Less than 1x a month, Never.
41.03% respondents in the research from 2010 answered "Daily" and 44.56% in the research from 2011 also answered "Daily". The exact differentiation by gender is shown in Table No. 16.

Table 16 – Answers to question "How often do you use the Internet?"

	2010			2011		
	Total	Men	Women	Total	Men	Women
Daily	41.03%	43.71%	38.86%	44.56%	47.66%	42.19%
1x up to 6x a week	25.88%	24.89%	26.68%	28.99%	28.04%	29.95%
1x up to 3x a month	12.24%	11.51%	12.83%	12.10%	11.63%	12.38%
Less than 1x a month	4.31%	4.46%	4.18%	4.56%	4.34%	4.75%
Never	16.55%	15.43%	17.45%	9.79%	8.33%	10.73%

Source: own research

Question No. 26: "Which of the following Internet services do you use?" Answers:

1. Electronic mail
2. Surfing the Internet for information
3. Chat / ICQ
4. Internet shopping
5. Digital TV
6. Radio broadcasting
7. Videoconference

71.38% respondents in the research from 2010 answered that they use "Surfing the Internet for information" most of all the Internet services. 78.87% respondents in the research from 2011 answered that they use "Electronic mail" most of all the Internet services.

Conclusion

The results of the questionnaire survey are important for optimal suggestions for adult education of persons over 30 years of age. On the basis of my evaluation of the answers of respondents, adult education in the area of information and communication technology can be assessed not only by age category, but also by education category as effectiveness of further education depends on the level of education hitherto completed. From this perspective, according to the research conducted in 2010, it would be a good idea to concentrate on upgrading the education of persons with elementary or vocational education. As far as the age category is concerned, the results of the questionnaire survey indicate clearly that respondents over 50 years of age have great problems with using present-day information and communication technology. The reason seems to be also in the fact that they had little opportunity to encounter such technology at school. Thus, whatever knowledge and skills some of them may have acquired, they are usually related to their work or the type of occupation they have or had in the past.

The results of the research in 2011 verified in some points the research of 2010. In some questions, however, interesting changes occurred, both positive and negative ones. The results of the questionnaire survey in the field of adult education brought interesting conclusions. It would be constructive to explore this theme in greater depth. Adult education of the population and motivation to participate in it is very important for every country and, above all, for the participating individuals. Individuals who do not age in their mind, thanks to continued education, find additional reasons for living in it and fulfilment of their lifelong dreams. Moreover, continued education opens the way for new social contacts that enrich their lives.

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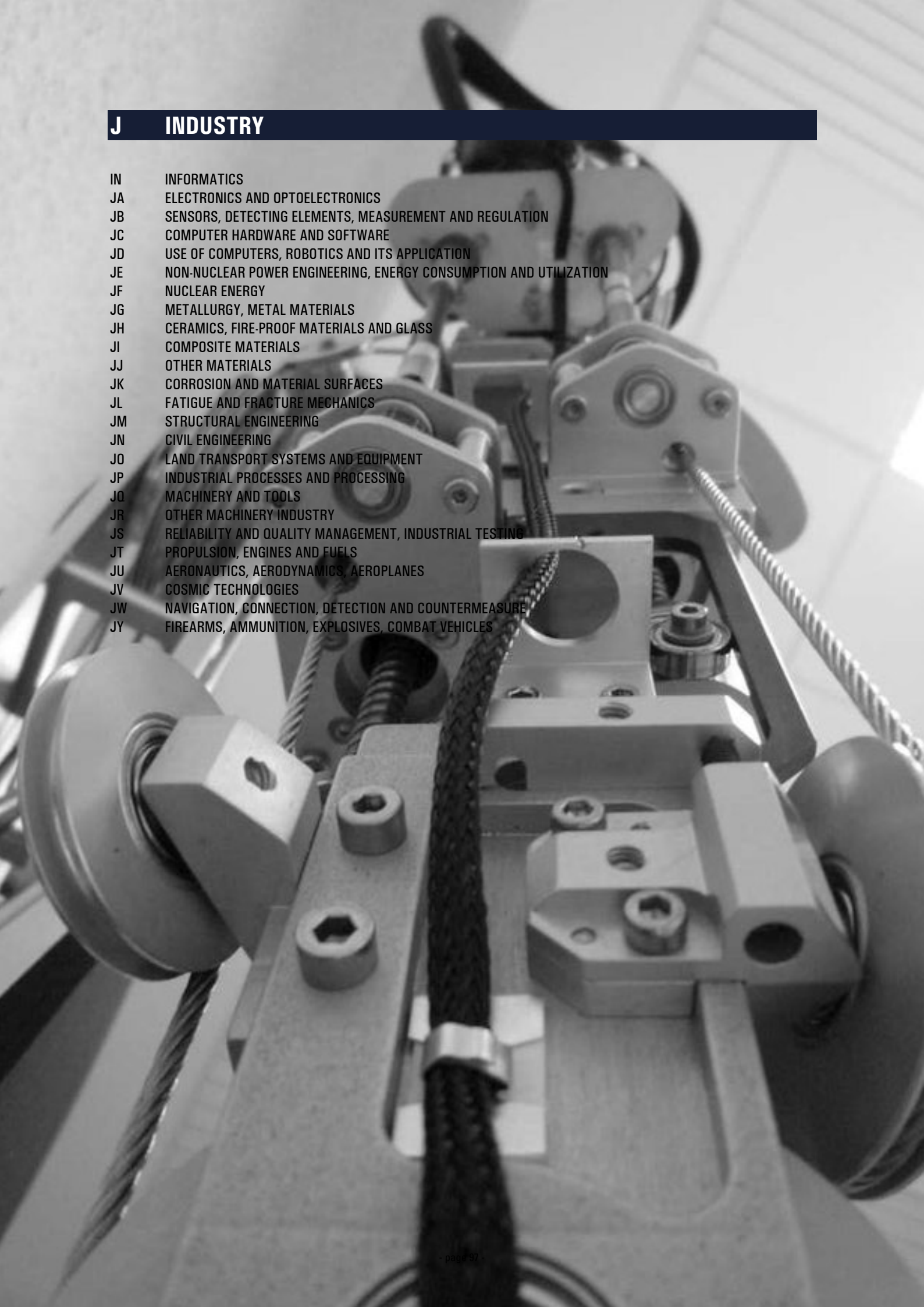
Primary Paper Section: I

Secondary Paper Section: IN



J INDUSTRY

IN	INFORMATICS
JA	ELECTRONICS AND OPTOELECTRONICS
JB	SENSORS, DETECTING ELEMENTS, MEASUREMENT AND REGULATION
JC	COMPUTER HARDWARE AND SOFTWARE
JD	USE OF COMPUTERS, ROBOTICS AND ITS APPLICATION
JE	NON-NUCLEAR POWER ENGINEERING, ENERGY CONSUMPTION AND UTILIZATION
JF	NUCLEAR ENERGY
JG	METALLURGY, METAL MATERIALS
JH	CERAMICS, FIRE-PROOF MATERIALS AND GLASS
JI	COMPOSITE MATERIALS
JJ	OTHER MATERIALS
JK	CORROSION AND MATERIAL SURFACES
JL	FATIGUE AND FRACTURE MECHANICS
JM	STRUCTURAL ENGINEERING
JN	CIVIL ENGINEERING
JO	LAND TRANSPORT SYSTEMS AND EQUIPMENT
JP	INDUSTRIAL PROCESSES AND PROCESSING
JQ	MACHINERY AND TOOLS
JR	OTHER MACHINERY INDUSTRY
JS	RELIABILITY AND QUALITY MANAGEMENT, INDUSTRIAL TESTING
JT	PROPULSION, ENGINES AND FUELS
JU	AERONAUTICS, AERODYNAMICS, AEROPLANES
JV	COSMIC TECHNOLOGIES
JW	NAVIGATION, CONNECTION, DETECTION AND COUNTERMEASURE
JY	FIREARMS, AMMUNITION, EXPLOSIVES, COMBAT VEHICLES

EVALUATION OF STRUCTURAL WOOD GLUED JOINT QUALITY, DEPENDING ON SELECTED TYPE OF AHDESIVE

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This paper has been carried out with financial support of Czech Science Foundation (GACR) project No: P104/11/1557 Complex Evaluation of Durability of Bonded Structural Timbers and the project of Specific research No: FAST-J-11-32 Quality evaluation of adhesives for structural wood glued joints using infrared absorption spectroscopy - methodology development of sample preparation and measurement.

Abstract: Structural wood glued joints are used to bond components of lamellar or agglomerated load-bearing members. Factor that influences the quality of the joint is the sensitivity of wood mass to ambient humidity changes. Cyclic wetting and drying of the timber leads to its volume changes and causes shear stress in the area of the bond line. Therefore, selected types of adhesives were tested according to a standard EN 302-1. In addition to shear strength assessment, a wood failure of specimens was observed. To get comparative samples for further durability evaluation, the infrared absorption spectroscopy analysis was performed. Further research will continue with examination of the joint quality of specimens in long-term external exposition and macromolecular changes in adhesive structure.

Keywords: Wood glued joint, shear strength testing, infrared absorption spectroscopy.

1 Introduction

The quality evaluation of wood glued joints adjusts standard ČSN EN 302-1 that prescribes design, parameters and preparation of the specimen and type of wood that should be used as supporting substrate. After curing, the specimen are exposed to accelerated aging test and their shear strength is evaluated in five types of exposition causing stress in the bondline area due to increasing moisture degree in combination with drying.

The expositions should simulate adverse conditions, which affect the usage of glued structural member in exterior. According to achieved shear strength value in every expositions, the adhesive is assigned to specific class of utilization.
In this case, the specimens were only under influence of exposition A1 (specimen air-conditioned at the temperature of 20 °C and humidity of 65 % for 7 days), which provides favourable conditions. As the accelerated test does not cause macromolecular structure changes, this type of exposition will be suitable as referential for the long-term testing of durability. Specimens designed to long-term testing will be tested afterwards, after two years of exposition to natural external weather conditions.

The macromolecular structure changes are consequence of cross-linking damage caused by environment work, especially the UV radiation. Such changes can be revealed using infrared absorption spectroscopy. First, there have to be determined the possibilities of the method – the sampling, the measurement technique and its accuracy.

2 Materials and methods

2.1 Specimens according to ČSN EN 302-1

The specimens were prepared by joining two plates made from beech wood (Fagus sylvatica) using three types of adhesives. All three adhesives are distributed by Akzo Nobel. Two of them – the one with melamine-urea-formaldehyde (MUF) and the one with emulsion-polymer-isocyanate (EPI) basis – are two-component adhesives, the other with polyurethane basis is a one-component adhesive.

Besides the properties of adhesives, another important factor that influences the quality of forming bond line, is the density of supporting wood mass. If the surface is more porous, the adhesive will be able to penetrate deeper to the structure and make stronger bond. Therefore, the density of wood plates was measured before gluing. Bonding parameters are shown in Table 1.

Table 1 Bonding parameters of all tree tested adhesives

Adhesive	Mixing ratio	Hardener	Pressure [MPa]	Pressing time [hours]	Glue spread [g/m^2]	Wood density [kg.m^{-3}]
PUR	-	-	0.8	1	200	690.9
EPI	100:15	1993	0.8	0.5	180	715.3
MUF	100:100	7557	0.8	3.5	400	700.2

After curing, the specimens were cut to required dimensions with prunings at the edges of tested area and air-conditioned in A1 exposition according to standard ČSN EN 302-1, i.e. 7 days at the temperature of 20°C and the humidity of 65%. All specimen were tested on the Testometric M350-20CT machine.

2.2 Samples for infrared absorption spectroscopy

Infrared absorption spectroscopy is an analytical method that is based on the fact that the interaction of the mass and infrared radiation causes the dipole moment changes of molecules of the mass. This changes induce vibrations of the molecules that absorb part of radiation energy, which will make a curve peak on the spectrogram. The wavenumber, on which the peak (spectral band) arises, is dependent on the length of chemical bond between the atoms in the molecule, so every chemical substance has its typical curve shape. If the chemically pure substance is analyzed, the bands can be exactly identified. Bands on the spectrograms of mixture can overlap. This fact greatly hinders their identification. That is the reason, why the infrared absorption spectroscopy is commonly provided as a comparative analytical method. [1]

There are several techniques of sample measurement, but most widely used are ATR (attenuated total reflectance) and transmission. The ATR technique does not require involved sample preparation, solid (altogether or grounded to the powder) or liquid materials can be analyzed. The ATR spectrograms are less accurate than the spectrograms obtained by transmission technique. Samples analyzed by transmission are only solid. If there is a possibility of making a thin film (polymer samples), the samples are measured that way, if not, samples have to be grounded to a fine powder and after mixing with the KBr compress to a tablet.

Two types of samples were prepared for the infrared absorption analysis:
- **Referential** – drops of mixed adhesives cured on polyethylene sheet with the diameter of about 1 cm.
- **Tested** – samples taken from the shear strength specimen fractions.

The preparation of referential sample was different for each used adhesive. As these samples should show the accuracy of tested sample analysis by comparison of the spectrograms, they had to be analyzed using the transmission technique. PUR adhesive made a thin film during curing, which was cut from the drop. MUF adhesive is brittle enough to be grounded to a powder. EPI adhesive is very plastic and hardens slowly, so it had to be deep frozen and then grounded to a powder. MUF and EPI were analyzed in a tablet.

The spectrograms of tested samples were obtained by ATR technique. The fractions of the shear strength specimen had to be soaked in water for one day and then mechanically disconnected in the bond line area. The sample was put onto a measuring

crystal with sufficiently smooth and flat cleaned surface of the adhesive layer.

Besides these two types, a spectrogram of pure wood was taken, so its bands could be excluded from the analysis.

3 Results and discusion

3.1 The shear strength testing

The shear strength of the joints was evaluated as the highest achieved force acting on tested area. Besides, the wood failure upon this area had to be considered, because, if its value was higher than 0%, it could be assumed that full or part loads was carried by the supporting wood mass. Also, the wood density had to be assessed as a factor influencing the increase of shear strength of the joint. Achieved results are shown in Table 2 and following graphs.

Table 2 Results of the shear strength testing

Adhesive	Wood density [kg.m^{-3}]	Wood failure [%]	Shear strength [MPa]
PUR	690,9	21,0	13,6
EPI	715,3	65,0	15,6
MUF	700,2	38,5	10,1

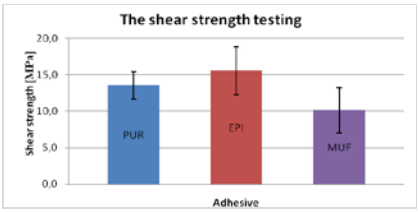

Figure 1: Graph of the shear strength testing evaluation

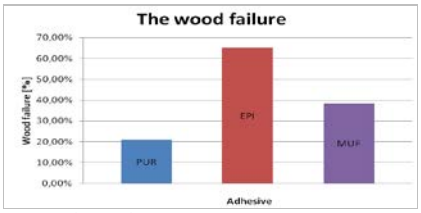

Figure 2: Graph of wood failure evaluation

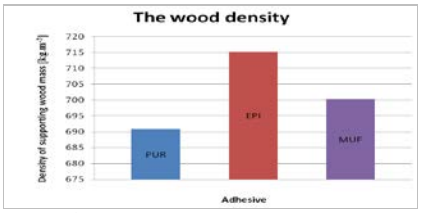

Figure 3: Graph of wood density evaluation

The highest shear strength was achieved by the specimens glued with EPI adhesive. These specimens were also mostly violated outside the bond line. Thus, it can be assumed that the real shear strength of the joint is even higher.

The specimens glued with PUR adhesive were spread on the most porous support, so the quality of the joint should be best according to the thickest layer. Most of these specimens violated in the bond line. Therefore, it can be considered that PUR joints has lower quality than the ones glued with EPI adhesive, because measured values are approximately corresponding to the real shear strength of the bond.

The lowest value of shear strength achieved the specimens bonded with MUF adhesive. The wood failure of these specimens and density of supporting wood mass are suggesting that these values of shear strength are corresponding to real strength of the bond too.

3.2 The infrared absorption spectroscopy analysis

The description of infrared spectra obtained from prepared samples was the first step of durability evaluation. In following period, the specimens exposed to the long-term aging test will be analyzed and their spectrograms will be compared to these ones. The appearance or disappearance of several bands will indicate structural changes in chemical bonds of the polymers.

Spectrogram of tested sample of each adhesive was compared to its referential sample spectrogram to make sure that all important bands can be measured using ATR technique, and to the pure wood sample to exclude bands of wood mass.

Important bands that will be monitored by structure changes evaluation are shown in Figure 4 (PUR), Figure 5 (EPI) and Figure 6 (MUF).

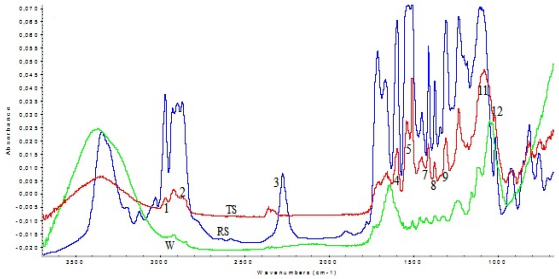

Figure 4 Spectrograms of PUR adhesive (TS – tested sample, RS – referential sample, W – wood curve)

Spectral bands of PUR adhesive that will not be overlapped by spectrum of wood support and should be checked on the spectrogram of long-term tested samples are in Table 3.

Table 3 Important bands that should be monitored on long-term tested samples of PUR adhesive

No.	Region	Chemical bond	Type of vibration
1	2940 cm^{-1}	CH	asymmetrical stretching
2	2860 cm^{-1}	CH	symmetrical stretching
3	2400 – 2200 (2280) cm^{-1}	N=C=O	isocyanate – hardener
4	1600 cm^{-1}	C=C	aromatic - stretching
5	1540 cm^{-1}	NH	amine - bending
6	1500 cm^{-1}	C=C	aromatic - stretching
7	1470 cm^{-1}	CH_2	bending, scissor
8	1360 cm^{-1}	C-N	amine - stretching
9	1350 cm^{-1}	CH_2	bending, wagging
10	1280 cm^{-1}	OCONH	urethane - stretching
11	1140 cm^{-1}	-O-C-	urethane - stretching
12	1000 cm^{-1}	OCONH	urethane - stretching

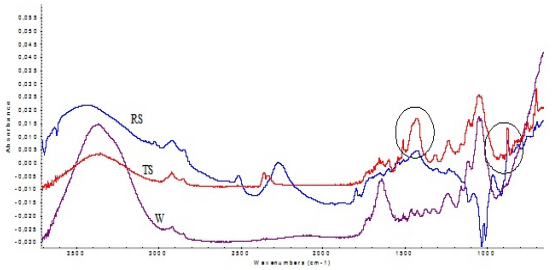

Figure 5 Spectrogram of EPI adhesive (RS – referential sample, TS – tested sample, W – wood curve)

The only two bands that could be checked on the long-term tested specimen are marked in Figure 5 (1430cm^{-1} and 880cm^{-1}). Both bands belong to an inorganic filler, which covers greater part of the adhesive mass.

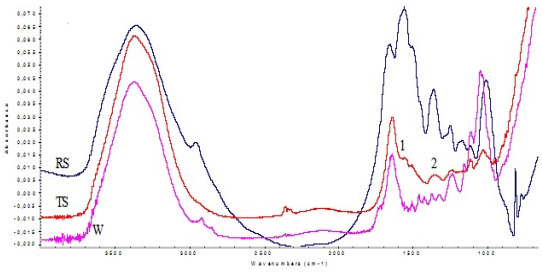

Figure 6 Spectrograms of MUF adhesive (TS – tested sample, RS – referential sample, W – wood curve)

Bands of MUF adhesive that will not be overlapped by spectrum of wood support and should be checked on the spectrogram of long-term tested samples are in Table 4.

Table 4 Important bands that should be monitored on long-term tested samples of MUF adhesive

No.	Region	Chemical bond	Type of vibration
1	1540 cm^{-1}	NH	amine - bending
2	1340 cm^{-1}	CH	bending, wagging

For the macromolecular structure changes evaluation, used method of sample preparation for infrared absorption spectroscopy analysis is suitable only for the PUR adhesive according to the accuracy. In its case, the long-term tested samples can be prepared the same way as the tested samples, as the amount of identified bands was big enough.

Spectrograms of EPI based adhesive show only the bands of its inorganic filler. To get the spectrum of pure polymer base of the adhesive, another treatment of the samples is needed. Further research will continue with preparation of referential sample by removing of the inorganic part and providing a transmission analysis of deep frozen and grounded adhesive base. Afterwards, the methodology of tested and long-term tested sampling will have to changed. The fraction of specimens will be mechanically disconnected in the bond line area. A piece of the specimen containing the adhesive will be deep frozen, then grounded to a fine powder and then analyzed using transmission technique too. This spectrogram will be compared to a spectrogram of wood mass removed from the same specimen to exclude the bands that belong to the wood support.

Because of the low amount of identified bands in the spectrogram of MUF tested sample, the sampling and sample preparation methodology will have to be change too. The tested and the long-term tested samples will have to be prepared as the ones glued with EPI based adhesive.

4 Coclusion

Three types of adhesives were evaluated according to standard ČSN EN 302-1 A1 exposition – PUR, MUF and EPI based adhesive. From these three types, best result of the shear strength testing achieved the specimens glued with the EPI based adhesive (average value of 15.6 MPa), the worst results were ejected by the MUF adhesive. Besides the shear strength testing, two more factors were monitored – the density of the supporting wood mass (as the porosity of the surface helps to create stronger bond) and the wood failure in the shearing area. The major part of EPI based adhesive glued specimen failed in the wood mass (65%), so it can be assumed that the shear strength of the joint is even higher than the determined. The values achieved by other two types of adhesives responded approximately to the real shear strength of the joints, as the wood failure of the specimens was low.

Further research will continue with the long-term aging test. A1 exposition tested specimens will be used as referential to the long-term aged ones to get a comparison of the strength and macromolecular structure changes. Therefore, an infrared absorption spectroscopy analysis of the specimens was performed. Sufficient results were given only by the samples prepared from the specimens glued with PUR adhesive. The analysis of the two other adhesives will have to be repeated on the samples obtained by changed methodology of preparation.

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Primary Paper Section: J

Secondary Paper Section: JJ, JN

CORPORATE RESPONSIBILITY - A MORAL COMPASS OF THE CONSTRUCTION INDUSTRY

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Abstract: The era of the economic recession created new epoch - the era of responsibility. It was never so important to demonstrate company's leading position, communicate its values and visions, restore the trust and reasonably manage resources, because responsible behavior usually leads to trust, loyalty and goodwill between customers, business partners and other involved parties. Corporate social responsibility helps to create values and is a moral compass in business environment. It is not enough to pragmatically look at profit indicators, but also it is important to consider impacts of company's social and environmental activities.

Keywords: corporate social responsibility, economic recession, profit indicators

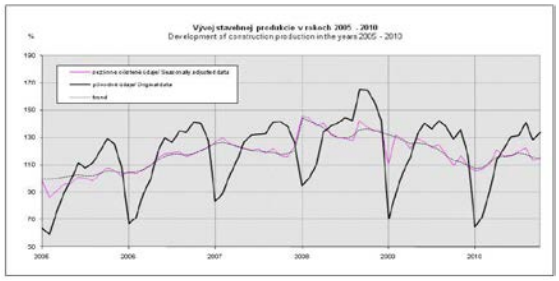
1 Development of the slovak construction sector

The Slovak construction sector has entered a new era. After a long period of growth, the latest years (2009, 2010, 2011) were showed a decline in the volume of construction. The main reason for such a change was the world economic crisis, which was also affecting Slovakia, with the long-term impact on Slovak construction.

As the latest results show (performed in May 2011), the expectation of industry decline has heavily increased. For 2011, 50% of respondents expect the industry to decline this year. On average these enterprises (total sample) forecast the construction sector decline at 1.8%, but if we take a more detailed look, the reality could be much worse: over 20% of respondents expect a decline of more than 4%.

With regard to sales developments for 2011, companies expect their sales to follow the overall construction sector's direction and for average sales to 0.9% growth in 2011 (the current forecast). Improvements are connected with changes in the overall sector (and economy), which are expected for the period 2012 – 2013, when average sales growth should improve to 15%. The main driver for the sales slowdown is a decrease in demand.

Figure 1: Development of the Slovak construction production in the years 2005-2010



Source: The Building Contractors Union of Slovakia, 05/2011

1.1 The obstacles to growth for Slovak construction companies

Most of the construction companies interviewed (89% in 2009, 90% in 2008) confirmed that they are experiencing obstacles in their business growth. If we take a closer look at the portfolio of constraints indicated, we can see that the key factor limiting companies' business growth is insufficient demand, which has swiftly grown from 26% of the respondents in 2008 to 43% of the companies in 2009 and 100% in 2011. The next factor was stiff competition, at 49% (49% in 2008, 33% in 2007). The most significant change is in the area of labor resources, which is viewed as a limiting factor by far fewer companies in the year 2011(3%) than the year 2008 (72%). This is explained by the increased number of workers in the labor market as a result of the reduction in demand and number of projects.[1]
Other obstacles include:

- Insufficient demand
- Weather conditions
- Insufficient labor resources (skilled)
- Insufficient financial resources
- Bureaucracy (dealing with public authorities)
- Competition
- Escalating cost of materials
- Escalating labor costs
- Other

2 Corporate social responsibility

The European Commission's definition of Corporate Social Responsibility (CSR) : "A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis." Corporate Social Responsibility is part of the Europe 2020 strategy for smart, sustainable and inclusive growth. It can help to shape the kind of competitiveness model that Europe wants. Corporate Social Responsibility can make a significant contribution towards sustainability and competitiveness, both in Europe and globally.

The adoption of CSR practices in Slovakia to date has been mostly spearheaded by private companies, often multinationals that are expanding their operations consistent with their own best strategic interests. Many companies that have been sensitive to their employees', customers' and communities' desires and perceptions have found a compelling business case for accommodating these desires and perceptions, beyond strictly legal and regulatory requirements.

In most cases, governments have generally seen that CSR can serve society's interests, and have been satisfied that lead companies are aligning themselves with business practices under the pressure of the "market". Governments appear to have been satisfied with an implicit policy of remaining aware and sometimes endorsing private-led initiatives while monitoring and enforcing compliance with regulations, without an explicit policy to broaden or promote CSR. This has been a relatively passive or disengaged policy stance, and has served countries with vibrant formal business sectors relatively well to date.

The challenge facing governments in Slovakia is to acknowledge, to the maximum degree possible, the perceptions and values of the business sector and voluntary nature of CSR and build on these, while recognizing that the countries' obligations to meet European environmental and social standards, and often dependency on exports as the "economic driver" requires actions that may be contrary to these perceptions. To encourage such actions may involve educating and negotiating for a stronger role for the governmental initiatives, enforcing national policies to conform to EU standards, and assisting firms in meeting them.

CSR and the economic crisis
CSR is more relevant than ever in the context economic crisis. It can help to build (and rebuild) trust in business, which is vital for the health of Europe's social market economy.
It can also point the way to new forms of value of creation based on addressing societal challenges, which may represent a way out of the crisis.[2]

2.1 Corporate Social Responsibility implements in construction companies

It is important to implement the corporate social responsibility in the organization as the CSR is a prolong commitment by business to ethical behavior, sustainable contribution towards economic development, while, improving the quality of the workforce and local community and society at large. Further definition of CSR is a commitment to improve community well being through discretion business practice and contribution of corporate resources. For elaboration, the concept of CSR is essential to examine on how companies manage the business processes to produce an overall positive impact on society.

The management toward CSR can be developed by considering the quality of operation in terms of people and processes, identifying the nature of business and any potential positive impact on society in the various areas. Besides, CSR is where business firms operate in society that offers them opportunities to make profits, simultaneously; in return they have the obligation to serve societal needs which is social responsibility. Hence, CSR is a framework for measuring an organization's performance against economic, social and environmental parameters towards an essence in building sustainable businesses, which need healthy economies, markets and communities.

The construction industry makes a vital economic contribution in terms of employment, so with CSR, unnecessary risks can be avoided by incorporating safe design and sick building syndrome. In the end, the construction industry reputation and image will able to stand out when there are social core values are take into account and not only for profit based.

Figure 2: Proposal of conception of the construction company management

Source: own proposal

The importance of environmental sustainability will increase in the future, based on demands from customers, climate changes and legislative measures. Solutions are thus often based on combinations of construction and building design and new materials. This includes, for example, the use of passive heating and implementation of new technologies/materials, such as photovoltaic solar cells to generate electricity for heating and energy requirements in buildings. Operators in the construction sector need to upgrade continuously their knowledge of new designs, building methods and materials. In order to stay ahead of competitors, construction companies are obliged to innovate their own products and processes to support sustainable development.

Sustainability awareness is rising among public and private users of buildings and constructions. The sustainability trend spans the whole life cycle of a building. In the construction process, various aspects should be taken into consideration:

- re-using existing built assets;
- designing for minimum waste;
- minimizing energy use throughout the life cycle;
- avoiding pollution;
- adding to bio-diversity;
- conserving water resources;
- respecting people and communities.[3]

Conclusion

Most of the factors which influence and drive change in the construction sector will affect it in the years to come. Most of the driving forces mentioned in this report are external factors, which are changing the framework conditions, against which the actors, for example, companies, employees, and sector organizations, will have to act.[4]
By analyzing economic and environmental policies together, by looking at ways to spur ecoinnovation and by addressing other key issues related to a transition to a greener economy such as jobs and skills, investment, taxation, trade and development, the OECD can show the way to make a cleaner low-carbon economy compatible with growth.[5]

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Primary Paper Section: J

Secondary Paper Section: JN

PROBABILISTIC SAFETY ASSESSMENT OF THE BUILDINGS DESIGN DUE TO THE BLAST LOAD

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Abstract: This paper deals with the problem of the probabilistic design of buildings under influence of extreme loads from above-ground explosion. The shock wave propagation in the air and the effect of space wave propagation to high rise building is evaluated. There is considered explosion of 100kg TNT at 40m in accordance of IS:4991-1968 for residential buildings. The response of the concrete structures under the shock load is a complex nonlinear and rate-depend process. Willam-Wärnke's failure criterion and the smeared approach for cracking and reinforcement modeling is used. The simulations of the variable input parameters (model and material uncertainties) are used on the base of the response surface method (RSM). On the example of the panel building the efficiency of the probabilistic analysis to optimal design of the high rise buildings is presented.

Keywords: probabilistic analysis, reinforced concrete, blast load, ANSYS

1 Introduction

In recent years, there has been considerable concern about the terrorism [2, 4, 8, 9, 11 and 12]. A structure may be subjected during its lifetime to extreme loading conditions that exceed its design loads [1, 3, 5 and 6]. Amongst these loading conditions are major earthquakes, explosions, unexpected impact forces, and fire. Unfortunately, many structures are not being designed to resist such extreme loads due to economic reasons. Numerical solution is complicated, because it is the problem of wave propagation in non-homogeneous medium and problem of time variation of the blast load. The wave propagation is simulated on 3D FEM nonlinear model in software ANSYS on the base of the Brode's explosion model [12]. The probabilistic analysis of the structure reliability may be used for the dynamics calculation and variable parameters in the form of the histograms in accordance of requirements of the Eurocode 1991.

Fig.1 Building collaps in Khobar Towers due to blast action (1996)

Fig.2 Building of Federal Murrah Building after blast attack (1996)

Fig.3 Buildings in Oslo after terrorist attack (2011)

2 Reliability analysis methods

From the point of view of one's approach to the values considered, structural reliability analyses can be classified in two categories, i.e., deterministic analyses and stochastic analyses. In the case of the stochastic approach, various forms of analyses (statistical analysis, sensitivity analysis, probabilistic analysis) can be performed. Considering the probabilistic procedures, The Eurocode 1 recommends a 3-level reliability analysis [3]. The reliability assessment criteria according to the reliability index are defined here. Most of these methods are based on the integration of Monte Carlo (MC) simulations [6 and 10]. Three categories of methods have been presently realized [6].

2.1 Straight Monte Carlo methods

The Monte Carlo methods are based on a simulation of the input stochastic parameters according to the expected probability distribution. The accuracy of this method depends upon the number of simulations and is expressed by the variation index:

$$v_{p_f} = \frac{1}{\sqrt{N p_f}} \tag{2}$$

where N is the number of simulations. If the required probability of failure is $p_f = 10^{-4}$, then by the number of simulations $N = 10^6$, the variation index is equal to 10%, which is an acceptable degree of accuracy.

2.2 Modified LHS method

The modified LHS method is based on the same number of simulations of the function g(X) as in the Monte Carlo method; however the zone of the distributive function $\Phi(X_j)$ is divided into N intervals with identical degrees of probability. This method provides good assessments of the statistical parameters of the structural response when compared to the Monte Carlo method. Using the LHS strategy, we get values like the reliability reserve parameter – the mean value , the standard deviation σ_z, the slant index α_z, the sharpness index e_z, or the empirical cumulative distribution function. The reduction of the number of simulations (tens to hundreds of simulations) means a valuable benefit from this method compared to the straight Monte Carlo method (thousands to millions of simulations).

2.3 Approximation methods - Response Surface Method

The approximation methods are based on the assumption that it is possible to define the dependency between the variable input and the output data through the approximation functions in the following form:

$$\hat{Y} = c_o + \sum_{i=1}^{NRV} c_i X_i + \sum_{i=1}^{NRV} \sum_{j=1}^{NRV} c_{ij} X_i . X_j \tag{1}$$

where c_o is the index of the constant member; c_i are the indices of the linear member and c_{ij} the indices of the quadratic member, which are given for predetermined schemes for the optimal

distribution of the variables (Montgomery, Myers) or for using regression analysis after calculating the response (Neter). Approximate polynomial coefficients are given from the condition of the error minimum, usually by the "Central Composite Design Sampling" (CCD) method or the "Box-Behnken Matrix Sampling" (BBM) method. Drawbacks of the method: The number of simulations depends on the number of variable input parameters; in the case of a large number of input parameters, the method is ineffective, the method is unsuitable in the case of discontinuous changes in the dependencies between the input and output values (e.g., the method is not suitable for resolving the stability of ideal elasto-plastic materials beyond the failure limit...).

3 Material model of concrete

3.1 Willam and Warnke material model of concrete

The concrete is a material with a different behaviour under compression stress and tension stress, also there is different behaviour under static and dynamic loading [11]. Therefore, formulation of failure criterion is complicated. Several failure criterion are well known for concrete- Mohr – Coulomb, Drucker – Prager, Willam – Warnke, Chen (Chen, W. F., Ting, E. C., 1980). In this paper is used Willam and Warnke failure criterion for concrete. Willam and Warnke (1974) developed a widely used model for the triaxial failure surface of unconfined plain concrete. The failure surface is separated into hydrostatic (change in volume) and deviatoric (change in shape) sections. The failure criterion for triaxial stress state is defined as:

$$F/f_c - S \geq 0$$

where F is a function of principal stress state, f_c is uniaxial crushing strength, S is failure surface. A total of five input strength parameters (each of which can be temperature dependent) are needed to define the failure surface as well as an ambient hydrostatic stress state. This are : f_c - the ultimate uniaxial compressive strength; f_t - the ultimate uniaxial tensile strength; f_{cb} - the ultimate biaxial compressive strength and $f_1 = 1{,}45f_c$; $f_2 = 1{,}7255f_c$

The Willam and Warnke (1974) mathematical model of the failure surface for the concrete has the following advantages:

a) Close fit of experimental data in the operating range;
b) Simple identification of model parameters from standard test data;
c) Smoothness (e.g. continuous surface with continuously varying tangent planes);
d) Convexity (e.g. monotonically curved surface without inflection points).

For using Willam-Warnke's model of the concrete in the ANSYS is required to define 9 different constants. These 9 constants are: Shear transfer coefficients for an open crack; Shear transfer coefficients for a closed crack; Uniaxial tensile cracking stress; Uniaxial crushing stress (positive); Biaxial crushing stress (positive); Ambient hydrostatic stress state; Biaxial crushing stress (positive); Uniaxial crushing stress (positive); Stiffness multiplier for cracked tensile condition.

Typical shear transfer coefficients belong to the interval 0.0 to 1.0. Coefficient 0.0 represents a smooth crack (complete loss of shear transfer) and 1.0 represents a rough crack (no loss of shear transfer). Convergence problems occurred when the shear transfer coefficient for the open crack dropped below 0.2.

The failure of concrete is categorized into four domains:

1) Compression - compression – compression
2) Tensile - compression – compression
3) Tensile - tensile – compression
4) Tensile - tensile – tensile

3.2 Smeared approach for concrete cracking

The presence of a crack at an integration point is represented through modification of the stress-strain relations by introducing a plane of weakness in a direction normal to the crack face. A shear transfer coefficient βt is introduced which represents a shear strength reduction factor for those subsequent loads which induce sliding (shear) across the crack face. The stress-strain relations for concrete that has cracked in all three directions are:

$$\left[D_c^{ck}\right]=E\begin{bmatrix} \frac{R^t}{E} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{R^t}{E} & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\beta_t}{2(1+\nu)} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\beta_t}{2(1+\nu)} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\beta_t}{2(1+\nu)} \end{bmatrix} \quad (3)$$

where the superscript ck signifies that the stress strain relations refer to a coordinate system parallel to principal stress directions with the x_{ck} axis perpendicular to the crack face. R_t is the slope (secant modulus) as defined on the figure 3.1.

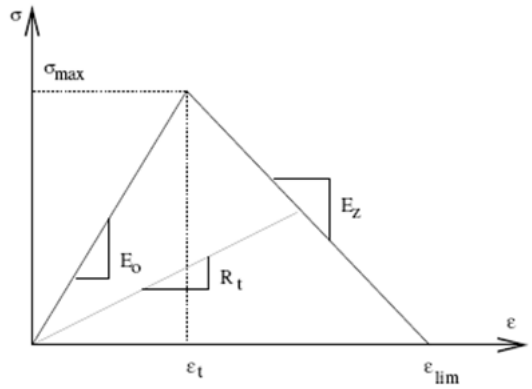

Figure 3.1. Strength of Cracked Condition

3.3 Constitution relationship for reinforcement bars

There is used smeared approach for reinforcement bars modeling. The stress-strain matrix with respect to each coordinate system:

$$\left[D_{sx}\right]=\begin{bmatrix} \rho E_s & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \quad (4)$$

where E_S is modulus of elasticity of reinforcement material, ρ is reinforcement ratio. For reinforcement steel is used bilinear stress-strain relationship and the breaking of reinforcement bars is given by maximal value of strain.

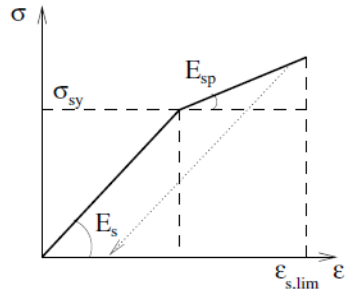

Figure 3.2. Bilinear stress-strain relationship for steel reinforcement

Material matrix of reinforced concrete is expressed in form:

$$\left[D\right]=\left[D_c^{ck}\right]+\sum_{i=1}^{n} D_{s,i} \quad (5)$$

3.4 Material design strength

Under the action of rapidly applied loads the rate of strain application increases and this may have a market influence on the mechanical properties of structural materials. In comparison with the mechanical properties under static loading the effect may be summarized as in the table 3.1.

Table 3.1. Dynamics increasing factor for properties of structural materials

Type of stress	Concr-ete	Reinfor-cing bars	Concr-ete 38MPa	Reinfor-cing bars 500MPa
	f_{dcu}/f_{cu}	f_{dy}/f_y		
Bending	1,25	1,2	47,5	600
Shear	1,00	1,1	38,0	550
Compression	1,15	1,1	43,7	550

4 Definition of blast load

The term detonation refers to a very rapid and stable chemical reaction which proceeds through the explosive material at a speed, called the detonation velocity, which is supersonic in the unreacted explosive [12]. The detonation wave rapidly converts the solid or liquid explosive into a very hot, dense, high-pressure gas, and the volume of this gas which had been the explosive material is then the source of strong blast waves in air. The blast effects of an explosion are in the form of a shock wave composed of a high intensity shock front which expands outward from the surface of the explosive into the surrounding air. As the wave expands, it decays in strength, lengthens in duration, and decreases in velocity. Expressions for the peak of static over-pressure P_{so} developed in a blast have been presented in the literature to model free-field conditions in which dynamic interactions of the wave front with objects obstructing the blast wave path is small enough to be neglected. P_{so} have typically been correlated with the scaled distance parameter (Z) which is defined by:

$$z = R/W^{1/3}$$

where R is standoff distance in meters and W is the charge weight of the blast in kg based on TNT equivalence. Brode (1955) developed the correlation between P_{so} and Z based on numerical modeling. This correlation was subsequently reviewed by Smith (1994) [12] who compared Brode's model with results obtained from more recent experimental studies.

$$p_{so} = \frac{1407,2}{z} + \frac{554}{z^2} - \frac{35,7}{z^3} + \frac{0,625}{z^4}; 0,05 \le z \le 0,3$$

$$p_{so} = \frac{619,4}{z} - \frac{32,6}{z^2} + \frac{213,2}{z^3}; 0,3 \le z \le 1,0 \qquad (6)$$

$$p_{so} = \frac{66,2}{z} + \frac{405}{z^2} - \frac{328,8}{z^3}; 1,0 \le z \le 10$$

The reflected over-pressure P_r arising from the interaction of the blast waves with a flat- surface has been modeled by Smith [12] and is approximated by:

$$P_{rmax} = C_r P_{so} \quad \text{where} \quad C_r = 3(\sqrt[4]{P_{so}}) \qquad (7)$$

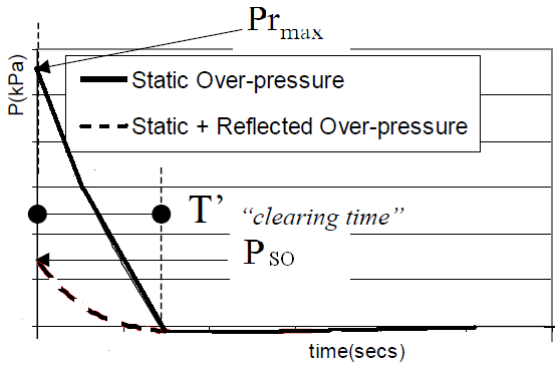

Figure 4.1. Time – pressure relationship

An important parameter in the reflected over-pressure is the "clearing time T" which defines the time taken for the reflected over-pressure to decay completely. The response of structure is dependent on the relationship of natural frequency of structure and "clearing time T''.

$$T' = 3S/U \qquad (8)$$

where S is minimum dimension on the frontal surface of the blast and U is the blast front velocity.

5 Computational model

There is analyzed shear wall of 21 storey residential building [11]. Analyzed wall is 60m high, 12m wide and the thickness of wall is 0,2m. Vertical load was modeled as additional node mass from element MASS21 from ANSYS element library. Vertical load is considered according to EN 1991 for residential buildings. Reinforcement concrete wall was modeled from 3D element SOLID65. Element SOLID65 from ANSYS element library is intended for modeling of nonlinear behavior of reinforced concrete structures. Willam and Wärnke material model of concrete is associated to SOLID65 element in ANSYS program. There was realized 78 RSM simulations for probabilistic and sensitivity analysis of the wall. Probabilistic analysis was compared with deterministic model. There was used Newmark time integration for solving the problem of structural dynamics and Newton-Raphson method for solving the problem of material nonlinearity.

5.1 Uncertainties of input data

The uncertainties of the input data were considered in accordance of the Eurocode and JCSS requirements [3 and 5]. The characteristics of the input data are presented in the table 5.1.

Table 5.1. Probabilistic model of input parameters

Characteristic	Material strenght	Elastic modulus	Density
Variabil. const.	f_var	m_var	g_var
Histogram	Normal	Normal	Normal
Mean values	1	1	1
Stand. deviation	9.96E-02	9.96E-02	0.10
Characteristic	Distance R	Model uncertainty	Resistance uncertainty
Variabil. const.	dis_var	e_var	r_var
Histogram	Normal	Lognormal	Normal
Mean values	1	1	1
Stand. deviation	0.10	0.10	9.97E-02

5.2 Blast load from explosion 100kg TNT distanced 40m from building

The blast load were defined as the time function in the form of the triangular diagram (fig.5.1) based on requirements of Smith [12].

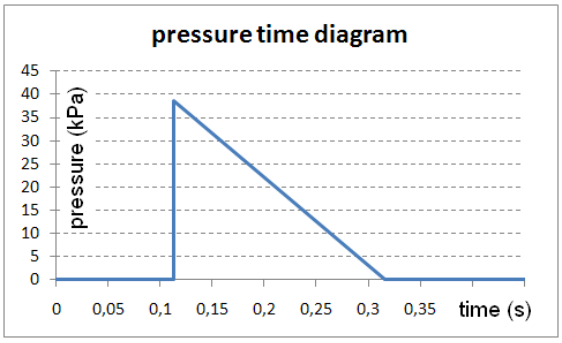

Figure 5.1. Pressure-time diagram of blast load

6 Analysis results

6.1 Criterion of damage limitation

Damage limitation of the reinforced concrete structures depend on the criterion of the maximum inter-storey drifts.

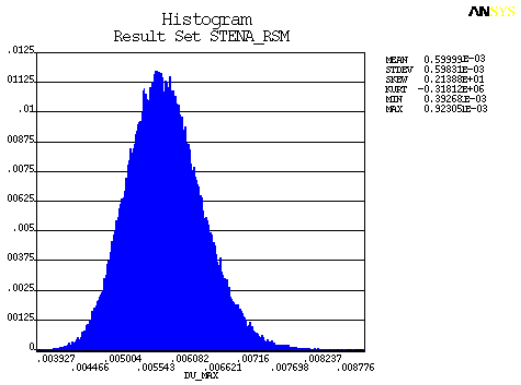

Figure 6.1. Histogram of output parameter d_E

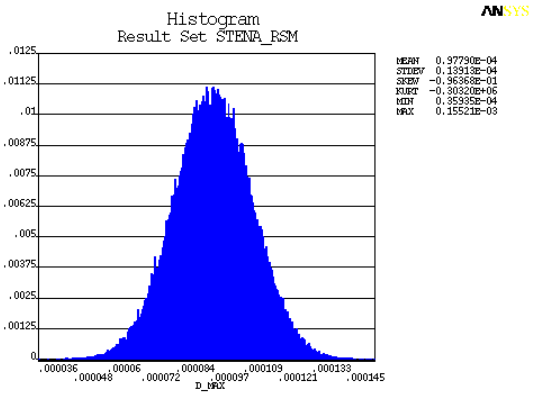

Figure 6.2. Histogram of output parameter d_R

The standard ENV 1998 define the function of failure in the form:

$$g(d)=1-d_E/d_R \geq 0 \quad (9)$$

where d_E is inter-storey horizontal displacement, d_R is limit value of inter-storey horizontal displacement defined in the form:

$$d_R=0{,}005.h.\nu \quad (10)$$

where h is storey height (h = 3m) and ν is reduction factor to take into account the lower return period of the seismic (blast) action associated with the damage limitation requirement.

6.2 Comparison of deterministic and probabilistic results

Table 6.1. Comparison of deterministic and probabilistic analysis

Method	Maximal interstorey drift (x 10^{-4})			
	Min	Max	Mean	St.dev
Deterministic	-	-	1,03	-
Probabilistic	0,36	1,15	0,98	0,1391
Failure probability	-	-	<1.10^{-6}	-

Method	Limit value of maximal interstorey drift (x10^{-4})			
	Min	Max	Mean	St.dev
Deterministic	-	-	500	-
Probabilistic	392,6	923,0	599,9	5,98
Failure probability	-	-	<1.10^{-6}	-

7 Sensitivity analysis

Sensitivity analysis of the influence of the variable input parameters to the reliability of the structures depends on the statistical independency between input and output parameters.

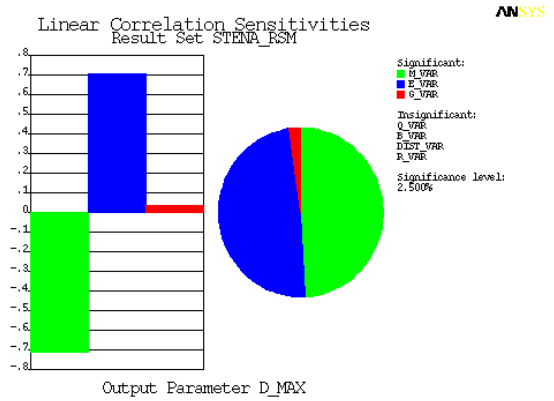

Figure 7.1. Sensitivity analysis for the reliability of the inter-storey drift

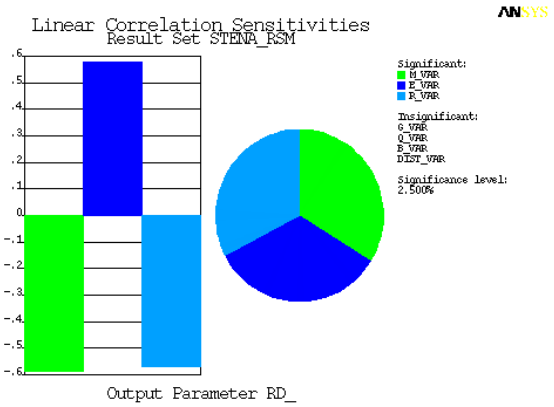

Figure 7.2. Sensitivity analysis for the reliability of the the function of failure

As is shown on Fig. 7.1, the main influence for interstorey drift resistance has the variability of input parameter of Young modulus of concrete, then parameter of model uncertainty and variability of density of concrete. The sensitivity analysis gives the valuable information about the influence of uncertainties of input variables (load, material, model,) to engineer for optimal design of the structures. As is shown on Fig. 7.2, the main influence for function of failure has the variability of input parameter of Young modulus of concrete, then parameter of model uncertainty and variability of parameter of resistance uncertainty.

8 Conclusion

This paper presents the methodology of dynamics analysis of the concrete shear wall on the base of deterministic and probabilistic assessment. There is presented nonlinear material model and stochastic and deterministic solution of resistance of reinforced concrete wall under shock wave. On the example of the sensitivity analysis the efficiency of the probabilistic analysis to optimal design of high rise buildings was presented. The results suggest that, the wall has due capacity to withstand the blast load.

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