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Mediated Learning Experience in Early Childhood as a base for Lifelong Learning

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Abstract

Behind all the rhetoric of lifelong learning lies the essential need to have more people thinking about what they are doing and how to improve it. It should also tackle marginalised people's widespread apathetic attitude to participation in local matters as the potential means to influence how they are able to live their own lives.

The government's urge for lifelong learning is implemented through educational institutions. Their task is to positively influence person's perception of further learning as something desirable and enjoyable. It requires curriculum to take on some innovative developments.

The paper focuses on the concept of the Mediated learning experience (MLF, R. Feuerstein). The concept is a tool aimed at raising the level of learning achievements of children from marginalised and culturally deprived environment. The lack of direct exposure to stimuli in early childhood results in the deficiency in both cognition and metacognition of an individual. These negative consequences - rooted in early socialization - act as barriers in motivation in the process of knowledge acquisition in all the period of life. Underdeveloped cognition marked by "sweeping and blurred perception", lack of "exploratory behaviour" or "comparative behaviour" precludes the individual to profit from informal education as well.

We present the results of the pilot research study on the research sample - children of 6-8 ages from socially disadvantaging background. The aim of the study was to identify the regularities in children's deficient cognitive functions as a result of the lack of mediated learning experience in their original cultural background. The results of the above study are utilised in developing cognitive stimulation program for the children in order to enrich their capacity to profit from both institutionalized and informal learning from lifelong perspective.

Introduction

Behind all the rhetoric of lifelong learning lies the essential need to have more people thinking about what they are doing and how to improve it. It should also tackle marginalised people's widespread apathetic attitude to participation in local matters as the potential means to influence how they are able to live their own lives. The government's urge for lifelong learning is implemented through educational institutions. Their task is to positively influence person's perception of further learning as something desirable and enjoyable. It requires curriculum to take on some innovative developments.

Recently, many studies and researches dealing with delimitation and definition of factors responsible for intellectual deficiency of a child were done. Cultural factors are considered, as well as influence of socio-economic status of a family, socially disadvantaging factor and other endogenous and exogenous determinants of child's development. According to Feuerstein (Feuerstein et al, 1986), when these determinants are associated with deficiency of interactions between an adult and a child; interactions based on *Mediated Learning Experience (MLE)*, cognitive functions, which are pre-requisites of child's learning, are not sufficiently stimulated – the output is its insufficient development. Or in another words, the lack of direct exposure to stimuli in early childhood results in the deficiency in both cognition and metacognition of an individual. These negative consequences - rooted in early socialization - act as barriers in motivation in the process of knowledge acquisition in all the period of life. Among the children from the surrounding poor in stimuli a psychological deprivation is often manifested (intellectual immaturity, developmental irregularities and behavioural malfunctions). Underdeveloped cognition marked by “sweeping and blurred perception”, lack of “exploratory behaviour” or “comparative behaviour” precludes the individual to profit from informal education as well.

Education is usually addressed as the prime system element in an attempt of breaking the vicious circle of undesired social reproduction. Some figures on the current status of educating Roma children in Slovakia are worrisome. 70-80% of Roma have less than a primary school education, while very few Roma have completed secondary education, finally, less than 1 % of Roma continue to higher education. Roma pupils are over identified as underachievers. Disadvantages in education are deepened by low school attendance and overrepresentation in special education facilities (Horňák, 2001).

As an attempt to address the problems outlined above, the research team of APVV (Slovak national research agency, Ministry of Education, SR) project *Dynamic assessment of the latent learning capacities of the children from socially disadvantaged background* (APVV-0073-06) has been put together. Within pursuing its aims the research team focused on: a/ how to assess cognitive abilities so as to get feed-back for improvement, b/ how to build an efficient inclusive curricular setting within the Slovak primary education. Slovakia is in the process of curricular reform with the more utilitarian type of curriculum underway. More attention is expected to be paid to education achievements rather than to prescribing certain sum of knowledge.

In an attempt to address the existing education system's shortcomings the research team dealt with the question of utilising a new curricular setting in Slovakia in order to stimulate pupils' effective gain of objectively measurable skills and knowledge. Such aim can be achieved through an application of adequate social and cognitive constructivism tailored to the needs of individual pupil. Social constructivism is based on sociocultural approach to development (Vygotskij, 1978, 1987; Feuerstein et al. 1980; Sternberg – Grigorenko, 2002; Kozulin, 1998), particularly on the belief that individual may be modified irrespective of:

- their level of functioning,
- the etiology of their level of functioning,
- the severity of their condition,

- the age at which the specific intervention is offered, in sum the belief on brain plasticity and cognitive modification.

In this paper:

- we specify the concept „*deficient cognitive function*“,
- we present the results of the pilot research study focused on diagnostics of the deficient cognitive function.

1. Deficient cognitive function

“*Cognitive processes are considered to be a “mixture” of natural abilities (overlapping with intelligence), motives, customs and attitudes towards learning and information processing (Haywood - Lidzová, 2007, p 27). According to Tzurriel (2001), cognitive function (or operation, used in synonymic meaning without semantic distinction, author’s note) is considered as a “conglomerate” of inherited dispositions, learning customs and attitudes towards learning. Experience from clinical researches and observations show it is very difficult to identify the real “sources” of cognitive function, so these information could be effectively used in the preparation of intervention programs of cognitive stimulation. Although the rate and character of deficiency, defect, can significantly vary among children, mutual connection - inter-dependence of cognitive functions often leads to many mutual cognitive deficiencies. The task itself, which is a child supposed to solve – metaphorically offers the place for general attack on the wide spectrum of deficient cognitive functions which can be, in the process of task solving, revealed or corrected.*

Feuerstein and his colleagues (Feuerstein et al, 2006a; Feuerstein et al, 2006b) have created the work structure, list or system of most frequently existing cognitive deficiencies of a pupil. Categorisation criterion within this, remarkably artificial and definitely framework structure, was the definition and delimitation of the three task solving phases, or three mental act phases, which can be observed in task solving. Tzurriel (2001) states these three phases of mental act:

1. *Input phase (input phase or compare with Jensen reception phase), during which perception, collection and gathering of information takes place:*
2. *elaboration phase (elaboration phase or transformation phase - compare with Jensen), during which processing of gathered information takes place.*
3. *output phase (output phase or communication phase - compare with Jensen), where the process of expression and communication of stimuli processed in elaboration phase takes place.*

Mental activity of individual in task solving requires controlling of task characteristics and dimensions in its particular phases; implementation of adequate cognitive functions as a basis for thinking processes for task completion.

The problem of academic incompetence can be attacked through an intervention program that basically addresses itself to the cognitive functions as the prerequisites of thinking and learning. According to Jensencognitive functions could be referred as *Knowledge Construction Functions (KCF)*.

Typical deficiencies occurred in the input phase of mental act:

- blurred sweeping perception;
- unplanned, impulsive, and unsystematic exploratory;
- behaviour;
- impaired receptive verbal tools and concepts;
- impaired spatial and temporal orientation, including the lack of stable systems of spatial and temporal reference;
- lack of or impaired conservation and constancy in face of transformations in one or more attributes;
- lack of need for precision and accuracy;
- lack of or impaired capacity for relating to two or more sources of information simultaneously;

(compare Tzuriel, 2001; Feuerstein et al, 2006b).

If a child struggles with many cognitive deficiencies in input phase of a task, it is not able to elaborate and solve the task. Many pupils, whose the abovementioned socialisation (as stated above) lacked stimuli, interactions and MLE, fail even in input phases of a task. This fact causes the filtering of further activity of a teacher and is refracted via cognitive deficiencies of a pupil. Therefore, extra effort of a teacher in mediation of curriculum is to certain extent useless. Deficiencies in perceptual tools are so substantial, that they do not allow optimisation of pupil's school performance. Cognitive deficiencies observed in elaboration and output phase of mental act can be identified in the same way.

In *elaboration phase*, there are factors corrupting the usage of available data by an individual. These deficiencies prevent proper data processing:

- inadequacies in the definition of a problem;
- the inability to select relevant cues;
- the lack of spontaneous comparative behavior;
- the lack of or impaired need for summative behavior;
- difficulties in projecting potential relationships;
- the lack of need for logical evidence;
- lack of or limited internalization;
- lack of or restricted hypothetical or inferential reasoning;
- lack of or impaired strategies for hypothesis testing;
- lack of planning behavior;
- an episodic grasp of reality;

(compare Tzuriel, 2001; Feuerstein et al, 2006b).

According to Feuerstein et al (2006b), these deficiencies often appear during data elaboration in combination, i.e. in significant amount in culturally disadvantaged individuals and individuals with low performance.

Deficiencies in *input phase* are those, which result in inadequate communication of final solutions. If an individual has problems in this phase, even adequately collected data and proper elaboration can result in inadequate behaviour. Specific problems can be listed as follows:

- blocking: lack of or impaired verbal tools for communicating adequately elaborated responses;
 - deficiency in visual transport (e.g., completing a given figure on the left side of a page by finding the missing part on the right side and transporting it visually);
 - lack of or impaired need for precision and accuracy in responding;
 - trial and error behavior;
 - and impulsive acting out behavior;
- (compare Tzuriel, 2001; Feuerstein et al, 2006b).

Affective-motivation factors

Affective-motivation factors can negatively influence attitude of an individual in task solving and thus influence overall cognitive behaviour. These phenomena were widely discussed by psychologists, who have experience with populations of children from socially disadvantaged environment (Deutsch et al, 1964, in Feuerstein et al, 2006b). In the process of researches and clinical practice, the following affective-motivation factors influencing cognitive development of a child were identified: feelings of competency/incompetency, presence/absence of internal motivation, fear of failure, frustration tolerance rate, need/absence of independent existence, will/unwillingness to look for and discover the new, awareness/unawareness of one's progress, reaction to criticism, and other.

One's behaviour showing the influence of the above mentioned factors should be the challenge for a pedagogue to look for deeper causes of deficiencies showed, as well as intervention and proper evaluation of the capacity, which modification is necessary. Affective-motivation factors have significant influence on all three abovementioned phases of a mental act.

2. Pilot research study focused on diagnostics of the deficient cognitive functions

2.1 Methodology

In the process of APVV project solving, software for identification of cognitive profile of a pupil was applied in this research phase. Profile of a cognitive competence of a pupil (PCCP) was considered and evaluated by licensed, "computer-based" tool for PCCP evaluation - *Learning Guide – LG*, which is the product of *International Centre for Mediated Learning, GA, USA* (www.mindladder.com). Software users – members of the research team – took part in certified, two-week training course before application of the software. Training under the leadership of *International Centre for Mediated Learning* director, the author of LG program, *Dr. Mogens Jensen*, was focused on mastering theoretical aspects of cognitive education, concept of cognitive modifiability of a pupil, theories of deficient cognitive functions and creation of potential cognitive stimulation of programs for pupils. Data collected via software application and program data processing evaluating manifestation of behaviour of a child in various learning situations are primarily used for quantitative analysis of cognitive deficiencies of particular child, as well as for affective-motivation factor analysis, which inter-correlate with cognitive performance of a child. The software enables identification of cognitive functions of particular child in three quality levels:

1. cognitive functions, which are developed and actively and adequately used
2. cognitive functions, which are used, but stimulation is required
3. cognitive functions, which are not present in the cognitive structure of a pupil and their development and systematic stimulation in the process of intervention is necessary (compare with Tzuriel, 2001; Feuerstein et al, 2006b).

Theoretical model of cognitive profile is based on 40 descriptors of knowledge constructing functions (KCF). The profile for individual learner can be constructed by means of software which processes the data (130 scaled evaluating statements on learner's behaviour).

2. 2 Participants

In the pilot phase, 34 pupils from socially disadvantaging background (Šamudovce elementary school, special elementary school in Jarovnice, Važecká elementary school in Prešov) were considered (by teachers trained in the evaluation process and consideration of pupils' performance). Average age of evaluated students was 7,6.

2. 3 Interpretation

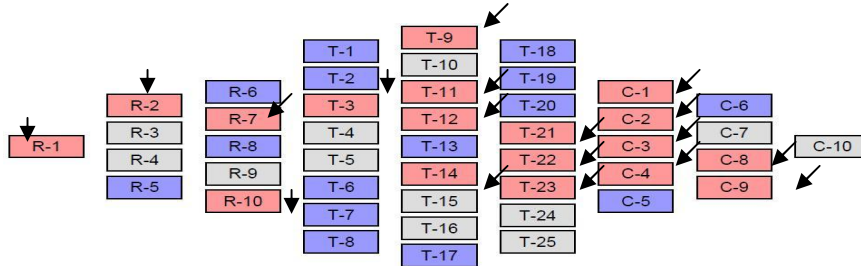
Interpretation of the collected data requires more detailed information regarding the essence of the software application and cognitive functions structure (CF) the software works with.

In the context of the report, CF for given sample in the pilot process identified as *cognitive functions not present in the cognitive structure of a pupil, of which development and systematic stimulation in the process of intervention is necessary*, will be mentioned only briefly. Attention will not be paid to cognitive functions evaluated as *developed* and to those, evaluated as *present, used, but lacking stimulation*.

In the category of not developed cognitive functions, attention will be partially paid to those identified on the software basis in more than half of evaluated respondents. In other words, the most frequent not developed cognitive functions were chosen. The condition for presenting cognitive function as a deficient one was the usage of median statistic characteristic. If a given cognitive function, in part of the sample in median range and more, appears as a deficient one – the fact becomes the criterion for presenting particular deficient cognitive function in majority of evaluated children in the report.

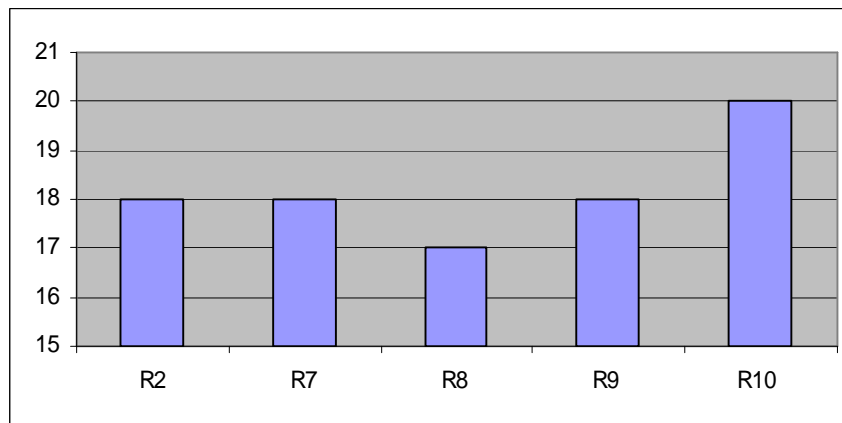
The software distinguishes deficient functions in *1. reception phase of mental act (R-functions)*, *2. transformation phase of mental act (T-functions)* and *communication phase of mental act (C-phase)*.

Figure 1. Cognitive profil of child XY, processed by software LG.



The deficient cognitive functions are marked by arrows.

Graph 1. Deficient cognitive functions in R phase of mental act – selection on the basis of appearance in more than half of evaluated respondents
Reception phase of mental act



The following deficient cognitive functions were evaluated in input R phase (reception):

- R10 – filtering multiple sources of information
- R9 – Appraisal of effort (intensity, persistence, precision, accuracy)
- R2 – Attention
- R1 – Closure
- R8 – Conservation of Identity

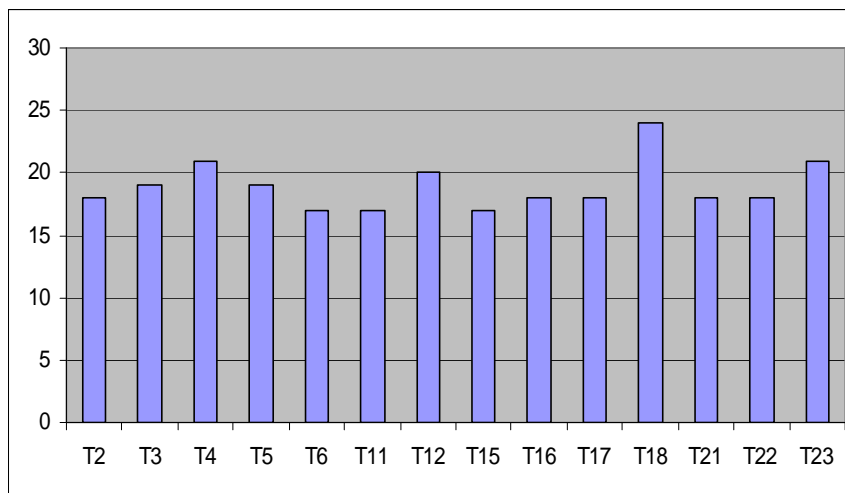
In the software program, there are 10 functions in the group of cognitive functions related to input phase of mental act, labelled as R functions (derived from Reception).

From overall number of respondents (34), cognitive function R1 was presented as not developed in 16 pupils, R2 in 18 pupils, R6 in 6, etc. Data in the range of median and more were put into the graph; the given cognitive function is evaluated as deficient in more than half of the respondents.

Transformation

Overall number of cognitive functions in T – transformation/elaboration phase (Transformation) is 25. In transformation/elaboration phase of the task, 15 deficient cognitive functions were identified (in accordance with our criterion stated below). For illustration, 5 are selected.

**Graph 2. Deficient cognitive functions in T phase of mental act – selection on the basis of appearance in more than half of evaluated respondents
Transformation phase of mental act**

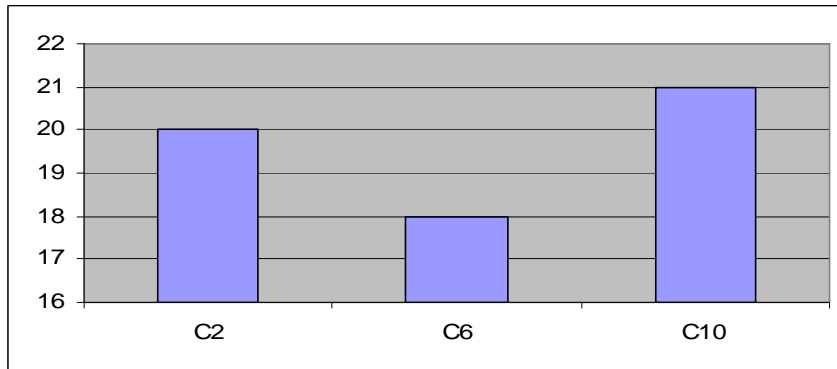


- T18 -Lexic operations
- T23 – Abstraction of cognitive categories
- T5 – Adequacy of cognitive field
- T12 – Generation of mental transformations
- T5 – Adequacy of cognitive field
- T3 – Preliminary problem analysis

Input phase of mental acts, in case of LG named as a communication phase (phase C – Communication), was characterised by the presence of 3 deficient cognitive functions (overall number of cognitive functions in this phase – 10):

- C10 – Selfregulation and authonomy
- C2 – Trial and error
- C6 – Verbal tools and concepts

Graph 3. Deficient cognitive functions in C phase of mental act – selection on the basis of appearance in more than half of evaluated respondents
Communication phase of mental act



LG software diagnoses affective-motivation factors too, in relation to motivation, performance and other personal characteristics. In this report, attention will not be paid to them.

Conclusion

The absence of mediated learning experience and mediated learning, cultural-cognitive deprivation in the early stage of child's socialisation is perceived as a basis for the basic obstacle of effective schooling of a child and consequent processes related to long-life learning. Insufficiently developed cognitive functions, operations, interpreted as basic conceptual tools at work with any curriculum causing failure of a child in the early stage of school education, determine his/her further socialisation as well.

The possibility of the development of teacher's competencies related to approaches of cognitive education and reflexive practice is considered. It is done knowing the need to diagnose the problems in cognitive development of a child as a result of insufficient adequate stimuli in the environment, where his/her pre-school socialisation takes place. Application of experience from certified training in the pilot survey by LG software shows us the basis for the creation of stimulating cognitive program for children from socially disadvantaging background. Insufficiently developed cognitive functions of evaluated children show the necessity to stimulate affective-motivation structures of one's personality (the effort to struggle in the task solving, endurance, attention, accuracy, the need to accept the challenge, the effort to look for new solutions, etc.). Individual phases of cognitive aspects related to task solving are accompanied by the absence of developed verbal tools and concepts, by behaving in the "attempt – failure" way, by insufficient effort in – intensity, endurance, accuracy and thoroughness, insufficient attention, absence of the ability to pre-analyse the problem, etc. The abovementioned as well as other cognitive deficiencies frequently cause that any lucrative curriculum and maintenance and supply of the school are limited by perceptual and motivation barriers of a child from socially disadvantaging background.

To conclude, the following question can be raised: how is it possible to develop teacher's competencies to diagnose cognitive deficiencies of a child caused by and only

by insufficient stimulation of the environment, the absence of MLE? How is it possible to intentionally and systematically stimulate the development of cognitive functions of the children in the conditions of elementary school education as a basis for life-long learning? Can we even speak about life-long learning without taking into consideration the cognitive as well as affective prerequisites for that process?

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