



## Searching Nearest Potential of Children with Intellectual Disability – Dynamic Assessment

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**Abstract:** *The article discussed the issue of the diagnosis with the use of task-support-task procedure. A theoretical model of diagnosis based on the concepts by L. S. Vygotski, R. Case, and A. Bandura was described and developed. The model was tested on a group of non-disabled preschool children, and children with mild and moderate intellectual disability who were paired up accordingly to their mental age. Each pair was given a set of developmentally adapted tasks. The tool (44 tasks) was reliable and valid. The task-support-task procedure significantly affected the level of the task performance in all the children and allowed to define the scope of potential abilities, especially in the children with mild and moderate intellectual disabilities. Most of the task they did fell into the zone of proximal development.*

**Keywords:** dynamic assessment, zone of actual, proximal and distal development, children with typical development, children with mild and moderate intellectual disability

Attempts to construct a diagnosis, which uses the strategy of guiding tips or „build scaffolding” were made by M. Budoff (1974), L. A. Venger, G. L. Vygotskaya and G. L. Leongard (1978), M. Feuerstein (1980). A review of available source materials showed that the proposals of the authors mentioned above are unsatisfactory -especially in case of children with intellectual delays- because either do not have standardized procedure of support or clear, transparent criteria of evaluation. Analysis of different theoretical trends and solutions in the psychological and pedagogical diagnostics enabled the author of this paper to create a theoretical model, that takes into account the characteristics of interactive, dynamic diagnosis, whereby it is possible to reveal the nearest of child potential.

## *Theoretical model of dynamic assessment*

The model of cognitive development assessment was developed on the basis of three concepts: L. S. Vygotski's sociocultural theory of cognitive development (1971), A. Bandura's social learning theory (1977, 1986), and R. Case's theory of cognitive change (1985). What these concepts have in common is the recognition of the importance of social environment for child development. According to sociocultural theory, child-adult interactions are fundamental for mental development. Cognitive change theory, in turn, regards social interactions as one of the sources for a child to gather experiences. And in social learning theory, the focus is on the person whose behaviors the child is to reproduce. The model of cognitive development assessment is composed of three links, each of which is justified in one of the above theories (Figure 1).

However, fundamental for the entire construct is L. S. Vygotski's concept of the "Zone of Proximal Development," which distinguishes two main areas: actual and proximal development. Their borders are defined by tasks of different difficulty. The Zone of Actual Development (ZAD) includes the problems which a child is able to solve independently; they reflect *"the level of development of a child's mental functions that has been established as a result of certain already completed developmental cycles"* (Vygotski, 1971:541). This psychologist maintained that the assessment of the actual developmental level does not give a complete picture of a child's abilities. In his opinion, it is necessary to determine the Zone of Proximal Development (ZPD), i.e. the problems which a student cannot solve independently, but which he/she is able to solve under guidance or with help from others. *"By using this method we can take account of not only the cycles and maturation processes that have already been completed but also those processes that are currently in a state of formation, that are just beginning to mature and develop"* (Vygotski, 1971:542). L. S. Vygotski's theoretical construction of developmental zones can be expanded by the Zone of Distal Development (ZDD) as this area includes the tasks given by the teacher which are too difficult for a child.

In accordance with the defined borders of the developmental zones, the educational assessment model provides for giving dosed support in case of difficulties. In most tasks, support will be graded in two successive stages:

1. the examiner carries out a given task using a method which is proximal to the child - the trial and error method most frequently, and
2. examiner and child carry out the task together, using a method which is proximal to the child, the examiner uses verbal prompts and provides hand-over-hand assistance - if it is necessary and if the child lets him/her do that.

Thus, such assessment includes components of controlled, strictly dosed instruction. We can then follow the process of a child's learning depending on the type and amount of support given. In his turn, R. Case (1985) claims that support in solving problems increases reciprocal regulation of child-adult interactions.

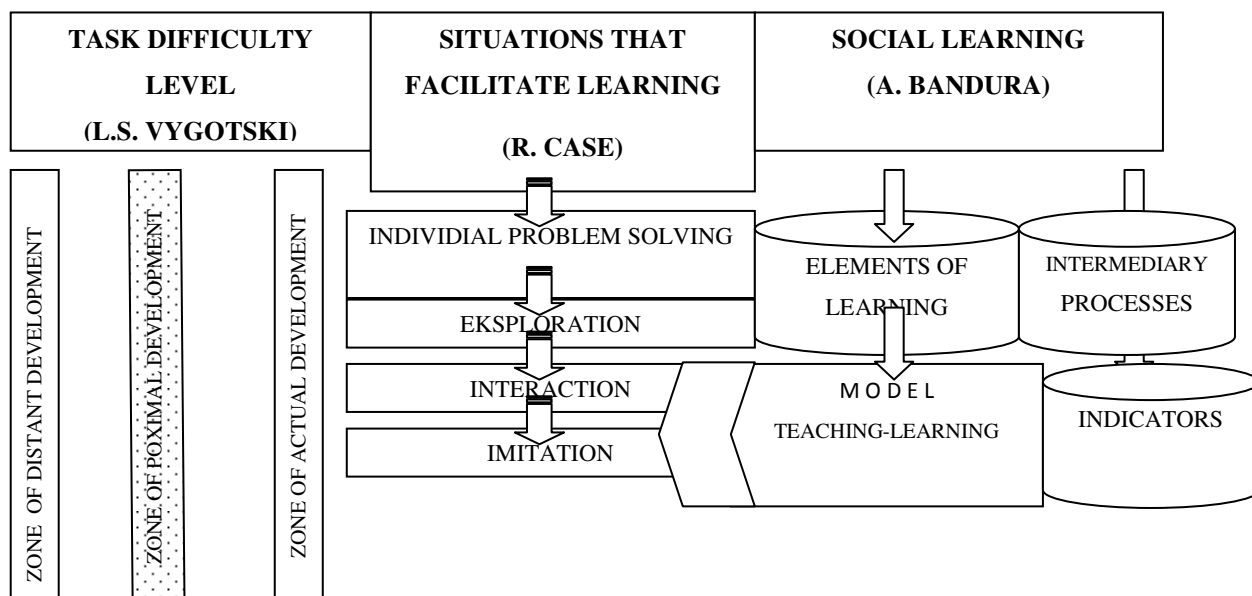
*Therefore, the interaction between the examiner and the child does not end up at the moment the child gives a wrong answer but it becomes more dynamic: the examiner begins to use cues which make solving the problem easier. The approach that takes into consideration the examiner's and the child's shared activity will be called dynamic assessment.*

The sources and situations which promote learning are well described in R. Case's cognitive change theory. They correspond to L. S. Vygotski's developmental zones. The tasks which an individual performs independently, in the course of his/her own activity, i.e. while he/she is solving problems and exploring independently, delimit the borders of his/her actual capabilities. And the tasks performed with the assistance of another person delimit the capacity of the child's proximal capabilities. They show a store of social experiences gathered as a result of interaction and imitation. Changes in behavior during the performance of a task depend on the interrelation between cognitive development (cognitive abilities) and learning processes.

Educational assessment will be based on the use of learning by observation and imitation of the teacher's behaviors, who will be - in accordance with A. Bandura's terminology (1977) - referred to as a "model." According to observational learning theory, it is this "model" - a person whose behavior is to be reproduced - that is a fundamental link in the whole social learning process.

Attention and retention processes, motor reproduction and motivation processes are intermediary factors in the reproduction process. Attention processes determine how attentively the child observes the "model's" behavior. Interest in the "model's" behavior and his/her attractiveness, the observer's arousal level and his/her expectations are examples of indicators of attention processes. Retention processes determine if modeled information will be remembered. Memory strategies and the child's cognitive functioning are examples of indicators of retention processes. Motor reproduction processes determine the quality of the reproduction of the "model's" behaviors by the observer.

Figure 1. A theoretical model for diagnosis of development potential



Source: Kulesza (2011:19)

His/her physical and imitative abilities, and also the complexity of the "model's" behavior are examples of indicators of motor reproduction processes. Motivation processes are of overriding importance to attention, retention and motor reproduction processes as they determine the choice of the model to be imitated, which, according to A. Bandura (1977), depends on rewards and punishments given to the "model" or the observer.

The teacher to be imitated had characteristics which would be attractive to the child. It was assumed that his/her friendly attitude, colorful and developmental age-appropriate toys shown one by one in a familiar place would promote the child's attention and prompt him/her into action. It was also expected that the assessed children would be able to remember modeled information (strategy to solve a problem) for a certain period of time (1-2 minutes). Also, care was taken so that the complexity level of the teacher's behaviors was appropriate to the children's developmental age. Moreover, it was made sure that all the assessed children had a good level of motor abilities.

There is one issue that remains, i.e. the issue of conditions in which modeling is most effective. It was assumed that the child's (observer's) behavior would be influenced first of all by vicarious consequences of the adult's behaviors. In this case, vicarious reinforcements would be: the performed activity, its final result (blocks have been placed inside the box, a doll has been assembled, etc.), teacher's emotional behavior (happy when a task has been performed, "infects" with positive emotions), attending to the child in a non-judgmental way.

The imitation of a problem-solving strategy modeled by the adult would be the result of changes in the child's behavior during assessment.

In R. Case's cognitive change theory (1985), imitation is regarded as a socially facilitated form of exploration, and if it is accompanied by active information processing, it is of benefit to the child. Most tasks provide for the demonstration of the trial and error method, i.e. comparing

consistently individual elements and rejecting wrong matches. This strategy provides the child with a model of effective problem solving on the basis of active information processing.

L. S. Vygotski's stated that the child can imitate actions that go well beyond the limits of his/her own capabilities; thus at first, the level of his/her understanding of what he/she imitates might be low. However, with time, "*learning to imitate under adult guidance, he/she is capable of (...) doing much more with understanding, independently*" (Vygotski, 1971:542). The above observations confirm the validity of the use of teaching/learning methods in educational assessment.

Cognitive change depends on the subject's own activity, his/her experience in solving problems, exploratory tendencies and curiosity about the world (Piaget & Inhelder 1996). That is why assessment will take into account the strategy the child uses, trying to carry out a task. A literature review and the results of the author's own studies indicate that there are four types of methods which show exploratory activity, the store of experiences, and task difficulty levels:

1. Doing things by force, chaotic actions, e.g. the child tries to place blocks in a box (busy box/shape sorter), pushing them into the holes by force. Ineffective method.
2. Trial and error method, e.g. successive attempts to fit a block into a hole. Effective but time-consuming method.
3. Hands-on measuring or approximation method. The child brings elements closer one to another, he/she measures them, because, for example, he/she cannot correctly estimate the shape of a block and a hole from a long distance yet. Effective method, the task is performed quickly.
4. Visual discrimination method, e.g. correct estimation of the shape of blocks and holes from a distance. Effective and the fastest method for solving problems that require visual discrimination and synthesizing (Kulesza, 2004:72).

The theoretical model describes in detail successive steps of the diagnostic process, it takes into consideration situations which promote learning, presents the types, mechanisms and indicators of learning. It is expected that the results of the assessment conducted according to this model will give the teacher a broader knowledge of a child's present and potential abilities, and of the type and amount of support he/she needs. The proposed model has the advantages of "assessment for development" (Obuchowska, 2002), whose main objective is to determine a child's sensitivity to the teacher's intervention, and to plan the most immediate developmental tasks.

## *Verification of the theoretical model*

*Group and tool.* The research group consisted of 75 children with intellectual disability, including 47 children with mild intellectual disability with mental age from 36 to 71 months, and 28 children with moderate intellectual disability with mental age of 36 to 71 months, and 75 children with successful development with mental age from 36 to 83 months.

The set of cognitive tasks developed by E. M. Kulesza (2004) was used. The Set of Cognitive Tasks includes 44 items (basic set) designed for preschool-aged children whose intellectual development is normative. Following the theoretical model of assessment, the aim was to establish the type and number of tasks that would determine the zones of actual and proximal development of children in four groups with mental age in the following age brackets: 3 years – 3 years 11 months, 4 years – 4 years 11 months, 5 years – 5 years 11 months, and 6 years – 6 years 11 months.

Statistical analysis showed that the tool is reliable and valid. All tasks were scored using a 0-4 scale, taking into consideration the utilized method for solving the task and the kind of help provided.

## *Results*

The intellectually disabled children found the diagnostic material interesting and seemed especially fascinated with the Russian doll. They continuously dismantled and pieced the toy and this manipulation-based activity was highly enjoyable for them.

When the children had the problems with solving a task, the teacher present the effective method proper to the developmental stage of the child. Some of the children were able to use the solving strategy, although some of them simply copied the teacher's movements without understanding their purpose. Such behaviour was also observed by S.I. Davydova (1975), N. G. Morozova (1984), and N. D. Sokolova (1973) in preschool children with mild and moderate intellectual disability.

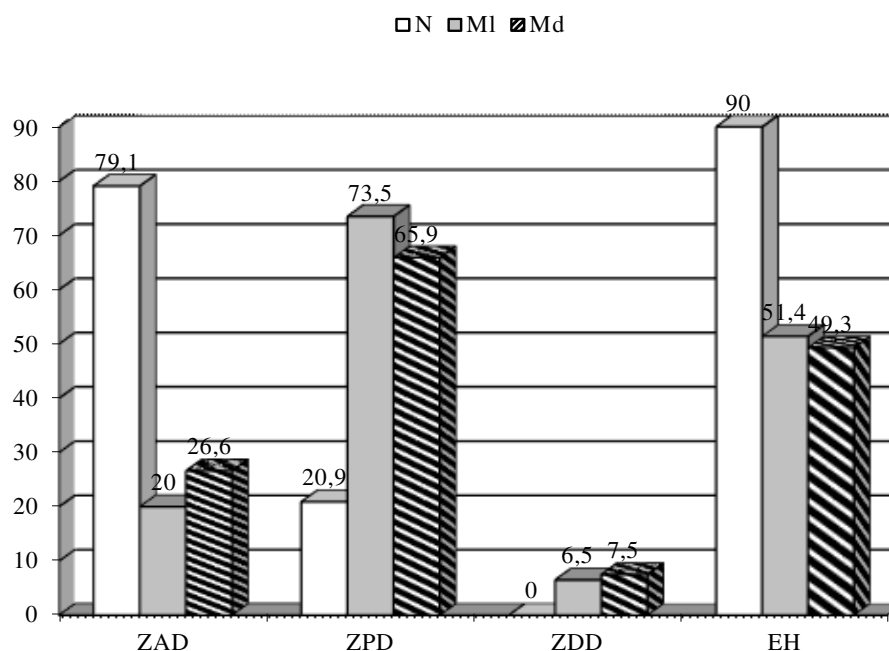
The children have also exhibited readiness to enter into interactions and were sensitive to the judgment of the teacher (e.g. frequently looked at the teacher, presented him/her the effect of their efforts and awaited acknowledgement and praise). Observations made by several authors indicate that children with moderate intellectual disability are able to effectively communicate and cooperate, which is manifested in their preference for a joint play with the adult (Kulikowska, 1971; Olechnowicz, 1988).

A definite strength of children with mild and moderate intellectual disability is their communicational sensitivity and well developed imitational mechanism. Those two serve as pillars on which the model of assessment is based.

The effectiveness factor for children with mild and moderate disabilities was similar - 51.4% and 49.3%. The effectiveness of prompts given to preschoolers with normative development was in the vicinity of 90% (Figure 2).

Children with successful development solved 79.1% of tasks while children with mild and moderate intellectual disability respectively 20.0% and 26.6%. Therefore in a standard test utilizing the pass-fail assessment, the children with intellectual disabilities would be graded extremely bad. In the dynamic assessment the help effectiveness was treated as a measurement of educational sensibility. The analysis of frequency, magnitude and type of help provided has shown that the Zone of Proximal Development of the children with typical development contained 20,9% of all tasks. The children with intellectual disability, when teacher used task-support-task procedure, were able to pass most tasks designed for their development groups, including 73.5% of tasks in case of children mild disability and 65.9% of tasks in case of children with moderate disability.

Figure 2. Tasks in development zones and effectiveness of help



ZAD – Zone of Actual Development; ZPD – Zone of Proximal Development; ZDD – Zone of Distant Development; EH – effectiveness of help; N – 75 children with typical development; MI – 47 children with mild intellectual disability; Md – 28 children with moderate intellectual disability. Source: Kulesza (2006:85, 2013:106).

The experimental results bear witness to a high level of cognitive potential in children with intellectual disabilities in relation to their zone of proximal development. Due to the system of guiding hints the results of the group have improved significantly.

## *Summary of results of the dynamic assessment*

Two effects are worthy to underline: children with moderate disability learned as quick as their peers with mild disability and all children were sensitive to the teaching methods utilized by the teacher. Children with intellectual disability effectively used every second hint. In specificity, the research has shown that:

- 1) children with mild and moderate intellectual disability demonstrated:
  - high communication sensitiveness: well developed need to remain within the attention area, need to have his or hers actions judged and need for cooperation. The strong sensitiveness to judgements (feeling of success or failure is determined socially) and strong need for achievement is suggested by research by J. Głodkowska (1998);
  - ability to imitate the solutions presented by the adult;
  - educational sensitivity: about 50% of hints were effectively utilized by the children with disability;
  - high development potential: they passed most test within their zone of proximal development;
- 2) no statistically significant difference between the level of task solving between the children with mild and moderate intellectual disability;
- 3) theoretical model of assessment gives a chance to reveal each child potential. The evaluation of sensitivity to teaching and determination of amount of support enable the teacher to develop an individual educational program for children with developmental delays.

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