

Dynamic Assessment/Intervention Its Gross Value

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ABSTRACT

We pretend think about the evaluation/intervention dynamic potential in psychological, neuropsychological and educational contexts, not forgetting their limitations and constraints, thinking their functionality with other modalities.

It is not a new strategy, judged likely to use, but it is suggested returning to and revision Vygotsky.

KEYWORDS: Assessment; Intervention; Dynamic; Authentic; Vygotsky.

INTRODUCTION

In Mind in Society [1], proposes a different way of performing the assessment and measurement of abilities, which move from a static view of children's achievements to a dynamic vision that can reveal more about the as the child learns. The proposed concept, Proximal Development Zone (ZPD) [2], is the organizing principle of this type of evaluation. In a Vygotsian ideology, the focus of analysis is on the measurement or assessment of learning and development dynamics, which include either establishing the current level of performance or achievement of the subject, or their potential to reach higher levels of development.

Under this perspective, development is defined not as a universal accumulation of capacities, or as a result of maturation processes, but as skills that emerge from the interaction of the subjects' capacities and means or support context. In this sense, the evaluation must ensure and reveal that learning occurs in a social context and must include and take into account the influence of the supports made available to the subjects.

Likewise, based on these same principles, post-Vygotskians developed the concept of instructional/teaching/learning experience, better known in the West, by dynamic or authentic or assisted assessment [2]. The main objective of this type of evaluation is to assist the evaluators, teachers, or educators in general, to understand both what the subject specifically knows and knows and the necessary steps or paths that enrich future and subsequent learning.

Dynamic evaluation concept

Based on the organizer Proximal Development Zone [2],

the dynamic or authentic evaluation, because in context, or assisted, because with support, can be considered an alternative, or, better, complementary, to the typical, traditional, psychometric evaluation. The Proximal Development Zone is defined as the distance that mediates between the current level of development of the subject, determined by his current ability to solve individual problems and the level of potential development, determined by solving problems under the guidance of others, peers, or no, more capable or at a higher level of development [2].

Assuming that the more orthodox evaluation/intervention generally refers to the mediation of fully developed competences and in which any intervention by the administrator of the test can either make the results of the tests impossible and render them invalid, we have, by contrast, dynamics, that the interactions subject analyzed and evaluator are sources of information as valuable as the individual realization of the individual. Dynamic evaluation reveals pieces or elements of "great photography" that are often neglected or neglected in the traditional assessment. It includes how the subject performs the task, with help or help, and how the subject is able to transfer this assisted realization to different tasks or even tests. In addition, dynamic evaluation provides the evaluator with information on how support interventions make a difference for the subject. This information assists you in making decisions about how to intervene. In addition, in the context of dynamic analysis, the valorization of the whole process of accomplishment of the task and not only its final product. Emphasis is placed on the observation of how and what the subject thinks, that is, their target characteristics, while concretizing and solving their problems.

In fact, in a brief and superficial analysis, it is considered that the objective of the traditional evaluation is to predict the future functioning in very general ways. Is the subject ready or able to enter school? Do you read as you have planned for your age, in the image of your peers? And, only the more specific tests can provide or allow diagnostic information, such as tests for specific learning issues. These specialized and specific tests provide a wealth of information that is often of little use to the day-to-day decisions at the level of teaching that teachers take or have to take. Traditional diagnostic tests tend to measure static capacities, to produce categories of capabilities, at a given time. Most often, they do not give teachers much guidance on how to assist a specific subject.

The followers of the more dynamic, authentic, deeper, more processual (more process-than-product), and more stimulating, or developmental, Vygotsian line of evaluation consider it to be the opposite of the assumptions of the traditional evaluation and testing paradigm [3,4]. For these followers [2], in the most common, fastest, most usual, or psychometric/traditional perspective,

- Only fully developed competences can be measured - which subjects can upgrade without support or assistance;
- The level of functioning revealed by the rigorous assessment reflects the internal capabilities of the subjects - what the individual currently knows and knows and can do or perform;
- The purpose of the assessment is to predict how the subject can learn in the future and or to classify the individual according to a category, such as "ready or able to enter school" or "exhibits problems of sensorimotor integration".

In a Vygotskian perspective, the more traditional evaluation, the evaluation of the fully developed competences, underestimates the abilities of the subjects, since the information obtained belongs only to the lowest level of the Proximal Development Zone (ZPD). Knowing what the subject can and does independently does not evaluate anything that is in the process of development. Only when the two levels of the ZPD are known - what the subject can and does alone and what can be done or supported - is that the range of subjects' abilities is identified. The ZPD reveals the skills that are emerging.

In Western Psychology, developmental achievements and learning outcomes are often associated with what the subject is able to do autonomously, alone, independently. This positioning has implications at all levels of education - from the classroom teacher who forbids children to help each other,

for example, in tests, to authors, researchers, or managers who define the expected level of developmental goals in terms of individuals' individual achievements. Consequently, all traditional assessment tools are thought to minimize the effects of the individual and administrator interaction of the test, whether teacher or other professional. Evaluators are trained not to give aid or to fabricate any judgments or inferences about the subjects' answers, nor to rephrase questions or explain test tasks. In this way, the result is that, practically, all the information collected, from the traditional evaluation instruments, reflects only what the subject can and does alone. This independent achievement represents an important indicator of the current performance of the individual - what the subject can do or do alone - however, for the Vygotskians, it is not the only indicator. Vygotsky [1] considers that the independent level of achievement is not sufficient to fully describe development. Equally important will be the analysis of the supports or aids that allow to evaluate the level of assisted performance. The level of assisted performance represents what the subject can do when the medium provides him with help. This aid includes, but is not limited to, the instructional (instructional) support provided by the teacher. The level of assisted performance measures the subject's potential ability to master new strategies, concepts, and skills by assessing the amount of help the individual needs to complete the task successfully.

The responses to the traditional tests may not reveal what the subject thinks when performing the task and hence may not faithfully translate their level of functioning [5].

How dynamic evaluation work

In a typical dynamic assessment session, the subject is initially pre-tested individually, to determine its current level, i.e., what it is able to perform independently [2]. Subsequently, it is retested, but now not independently. They are given by the educator, guidelines and support or aids, in the way of precipitants (cues), suggestions, requests or strategies. This support can also be reversed in the form of a new learning context in which specific materials or interactions with peers potentiate or promote the subject's performance at a higher level. Finally, the subject is evaluated in an analogous task, where the same skills or concepts are used or demanded [6].

Contrary to the traditional modalities, in which subjects are given tasks that they must already master, in the dynamic evaluation, the items are chosen according to their ZPD, which they are not mastered by them. The pretest is performed to clarify what the subject does not understand. Thus, during

the evaluation, the subject is supposed to learn the task being evaluated. The same tasks can be provided to subjects of different levels of education or development. If the subject reveals mastery of the concept, or successfully perform the task, in the pretest, he is given another different, more difficult, and followed by a follow-up test, to evaluate what future learning will be able to perform.

Once the pre-test is done, the evaluator can start the second phase of the evaluation, in which the subjects are given suggestions, aids, and precipitants, quantifiable and controlled. These supports are anchored in the assessor's knowledge of how specific skills or concepts develop - the developmental continuum of the skills or concept at stake; the use of teaching tactics - mediation, private speech and shared activities; and knowledge about the type of errors commonly encountered by subjects. Interventions are planned carefully and will take into account what the subject is able to understand or do not understand, fundamentally when the concept or construct is complex. The evaluator should plan a number of aids, or supports that are contingent on the responses of the subjects. Aid is not expected to be useful to all individuals, but should be tailored to the specifics of each individual, depending on their specific abilities and level of understanding or pattern of difficulties. In the course of the evaluation, the evaluator should note or record, not only what the subject says or does, but also their reaction to the suggestions and aids - how much they help or not. Evaluators may, if they perceive that the subject does not need help, not use certain levels of supports or aids.

After the evaluation is completed, and the subject is able to successfully complete the task, the evaluator introduces a new analogous task, with the same elements, to which the subject performed with help. The performance of the subject is observed. Did the subject incorporate, internalized, the strategy that was taught or suggested? Is it able to perform the task autonomously or independently? If the subject is not able to perform the task autonomously, does the reintroduction of the same tips and suggestions or help facilitate successful learning?

Post-Vygotskian Applications of Dynamic Assessment

Like the concept of Zone of Proximal Development, the dynamic assessment was initially applied in the area of special education [4]. This type of assessment is especially useful when it is used to determine to what extent the low level of mental functioning is caused by deficits or delays in development or educational or educational weaknesses. In Russia, this type of

evaluation was initially used for the diagnosis of borderline cases in situations of mental deficiency [6,7,8]. Later, when dynamic assessment became more popular in the West, its use extended to a wide range of problems, including situations in which standardized diagnostic tools were not discriminatory enough to distinguish neurological or contextual causes for cases of fragile intellectual functioning or academic progress. R. Feuerstein and his collaborators are closely associated with this type of evaluation; have applied the dynamic evaluation methodology as a way to enhance children's cognitive and linguistic skills [9,10,11].

In addition to special education, there have been few applications of dynamic assessment [12]. However, although a time-consuming and demanding process, it provides more information about the subjects and is used, for example, in the analysis of the development of reading and writing [12]. For example, Spector used dynamic assessment to assess children's phonological awareness. In their study, children who could not segment the word into separate phonemes received a series of tips or aids [13]. These aids included pronouncing the target word slowly, requesting that it identify the 1st sound of the word; helping the child with the number of sounds of the word; modeling the segmentation using the Elkonin boxes and using the boxes together with the child, while segmenting the word. The result obtained by the child in this type of evaluation reflects the number of aids and the level of support that each aid provides. For example, saying a word slowly to the child requires less assistance or help from the adult than working with the child to place the cards in the Elkonin boxes. Spector concluded that children's results from the dynamic assessment were a good predictor of progress in future reading, rather than traditional static assessments in which children were assessed without adult help.

Abbot, Reed, Abbot and Berninger [14] investigated the use of dynamic assessment in reading and writing and concluded that it was very useful for the identification of children with language difficulties. Gillam, Pena, and Miller [15] used dynamic assessment to assess children's narrative abilities and expository discourse. Gindis and Karpov [16] proposed the use of dynamic evaluation for the entire domain of problem solving. Kozulin and Garb [17] developed the dynamic evaluation in the context of text comprehension.

Most of the studies that use the dynamic evaluation methodology obtain results consistent with the Vygotskian assumption, which considers that for an incisive and predictive evaluation of the individuals' development, two measures are necessary: one of the autonomous performance and another

of the assisted or supported performance(s).

Informal dynamic evaluation/intervention

So far, we have been thinking of using dynamic evaluation as a formal evaluation. The common feature of formal assessment is the use of the same assessment protocol with all children as well as the instructions, suggestions, and precipitators used. However, this type of observation/analysis can be thought of in the context of informal assessment in the classroom by the class teacher, class, group [18]. Decisions are made daily on children, or subjects, in general, from informal information. In the informal dynamic assessment, the teacher experiences different levels of support to find out if the help is and what help promotes learning. The conditions for evaluation may vary from subject to subject and from day to day. This lack of standardization is not important for day-to-day or day-to-day decisions, which should be reviewed frequently, and it is also not an objective to know the relation of the current performance of a subject relative to the rest of the group [18].

In informal dynamic assessment, the emphasis is placed on finding the kind of help that works for the child at a particular time or task. The teacher can try various approaches to try to figure out which works best. The following examples, based on the use of informal dynamic assessment, refer to the task of writing the name, the child, and the teacher's scaffolding.

Example of dynamic assessment (observation) in the classroom

Asking the child (small or first year of the 1st cycle) to write his/her name is a common task used by educators, in order to quickly evaluate various skills. The first letters small children are able to identify are those of their name. If we add the dynamic component to this procedure it helps the teacher to evaluate the competences more effectively, allowing a more efficient planning of instruction or individualized teaching [18].

The use of dynamic evaluation implies and lacks a developmental sequence that helps the teacher to identify the main elements to evaluate and that provide a fundamental framework for the subsequent support. There have been a number of descriptions of the development of name writing in children. Generally, these descriptions, for young children, follow, or may follow, the sequence [18]:

- The child can discover his name, from various given names;
- The child scribbles or draws, and these achievements are

labeled as child's name;

- The child distinguishes, from several labels, those that are defined as my name
- The child makes marks that look like letters (shapes, letters);
- The name is distinct and some letters are interspersed with letter-like forms;
- Several letters can represent the name. These can be written correctly, or in mirror;
- All letters of the name are represented. Some or many may be correctly placed, others may be mirrored;
- All the letters are represented and well placed.

The hints, suggestions and precipitants used in the support of name writing, at a higher level, involve the imitation and use of Vygotskian tactics (Figueira et al, [2]): mediation (the use of a letter as an example or a color pen to draw attention to specific aspects of the letter), private speech (using up-wheel type words to describe motor action when writing P and shared activity (when the educator physically guides the hand of the child or when the child only writes some of the letters of the name).

The following is an example of the dynamic evaluation in a room at the beginning of the 1st cycle (see, for example, Figueira et al., [2]):

Antonio: Assessment 1. The teacher asks Antonio to write his name. The child writes without support. This represents the independent/autonomous level of performance. The teacher asks if this is the name and he says "yes".

The teacher shows Antonio a series of names of colleagues, from written labels. He is able to find out his name when they do not start with A. However, he has doubts when the other names begin with A.

The teacher puts the name tag in front of you and encourages you to pay attention to the letter. He models how to write an A, saying down-down-dash, providing him with private speech as support, which will assist him. The child does not respond. The teacher puts his or her hand on the child's hand and repeats the graphics, simultaneously saying down-down-dash. The teacher slowly withdraws his hand and the child completes the task, repeating the phrase down-down-dash.

As can be seen, evaluating Antonio while providing support

(using a dynamic evaluation) is better revealing a higher level of writing than evaluating his individual and independent performance. The child's response to the teacher's support means that his ability to join the letters is at an emergency point, i.e. his ability to control and master writing can benefit from teacher modeling support.

Antonio: evaluation 2. A few weeks later, Antonio writes his name alone. However, only a few letters are represented and are inverted and, although well written, are written from right to left.

The teacher points to the place where the child should start writing and places a point and an arrow indicating the direction.

Concomitantly, it must be accompanied by the verbalization "Start your name here, at this green point". This is said and you are expected to do it alone. It is observing its performance: begins the first letter on the left, hesitates in the second letter and asks how to write the T.

Comparing the writing of the child with and without modeling, the teacher realizes that Antonio needs help in the direction of his writing and in the spelling of some letters. Find the label with your name and try to write your name. For a few weeks you will use the model as a form of support.

Antonio: Assessment 3. Several weeks have passed since the last dynamic evaluation. The teacher watches Antonio write his name. Already includes almost all the letters of your name. Most of the lyrics are well written, although some are not.

The teacher understands that for a better learning, the child always has the model in front of him and chooses to emphasize the letters that still do not appear in the writing of the child, removing the other supports [21-25].

Subsequently, the teacher tries to have the child match his/her essay with the label provided, so that he or she will be aware of any misprints. It draws attention.

After these reflections, the child produces the task.

In the following weeks, the professor realizes that Antonio needs, less and less, the plaque or etiquette with his name and, gradually, encourages him to write without support. After two weeks, Antonio can write his name without any support, neither the teacher nor the mediator.

The supports provided by the teachers should be adapted to the needs and characteristics of the children. Although

strategies may be the same, they should be appropriate to situations and the subject.

These examples of dynamic evaluation do not end in one session. The teacher must accompany and be attentive to the tests of the children until they internalize the aids and the supports [25-33].

CONCLUSIONS

For the aforementioned, we are to assume the value of dynamic evaluation not only as a strategy or resource of analysis of the subjects, but also a tool for learning, with a teaching or instruction function, for development, because of intervention.

In fact, the dynamic evaluation provides the evaluator with new tools to make decisions and to help and enhance the subjects' learning. The evaluator, educator, can realize which helps make the most sense and is more valid to help each child in specific situations. These aids are used whenever the child, or subject, needs them. When the child or subject is able to perform the task without a specific aid, i.e. autonomously, a new dynamic evaluation is carried out to determine and establish a new aid plan according to new or different and/or more complex tasks. The aids will only be suspended, or withdrawn when the teacher has guarantees that the child accomplishes the task successfully, in a perfectly autonomous way.

It is important to realize that the direct help provided by the adult is not the only type of support that can be or is used in the autonomous evaluation and consequent teaching. Other types of support may include external mediators, private speech, or writing, as well, various social support contexts, such as simulation games for pre-school children. For example, observing the language that the child uses in simulation games is usually richer and more complex than interacting with the teacher, they can help determine or establish forms of support that are fundamental to language development.

The dynamic evaluation is therefore fundamental, even to facilitate instruction/teaching, in addition to being important, because informative, in all situations, the simplest, in which the child performs autonomously, the most complex, that the child is not able to perform alone. It is these types of task gradients and the performance of children that allow defining the ZPD. Once the ZPD is defined, and from there, it is possible to plan individualized teaching.

Also, dynamic assessment allows teachers to establish a new

alternative framework for communication with parents. Thus, instead of “domain” or “needs” information and descriptions, the teacher can use the expressions “independent performance” to describe the child’s progress, “moderate-attendance performance,” or “achievement with much help” in the various domains or skills. This type of language refutes the dialogue with the parents, valuing the capacities and the probabilities of development, in a perspective more positive and reinforcing.

However, the further development of dynamic evaluation measures and their applications in various areas of development is a significant challenge, due to the nature of this methodology [19]. One of the challenges is the compatibility of its results with those obtained by traditional static assessment instruments. Another is the standardization of evaluation procedures, when the type of assistance or assistance provided varies significantly between the subjects and/or between the evaluators. In addition, it is unclear whether the dynamic evaluation procedures measure or evaluate multiple domain-specific processes, or measure or evaluate a simple feature that reflects the learner’s ability to benefit from adult, i.e. domain-independent, help. Russian special education educators use the term educability to describe this domain-independent characteristic; Feuerstein uses the term cognitive modifiability.

While these issues remain open, although slowly but increasingly recognized by educators, as a proactive, process-oriented assessment, new tools for dynamic assessment continue to be developed with the goal of an educational evaluation. This increasing adherence to this guideline may be due either to dissatisfaction with the traditional assessment methodology, fundamentally when used with young children (eg.) [20], or to the realization that static tests are not compatible with the growing popularity of teaching philosophies around active learning and knowledge building.

Not always exclusively, but often, in concomitance with other modalities of evaluation/intervention, the dynamic strategy, because more authentic, but with rigor and control, structured, should be, in our perspective, the most used.

REFERENCES

1. Vygotsky LS (1978) *Mind and Society: The development of higher mental process*. Harvard University Press, Cambridge, MA, USA.
2. Figueira APC et al. (2014) *Ferramentas da Mente: a perspectiva de Vygotsky sobre a educacao de infancia*. Coimbra, Imprensa da Universidade de Coimbra.
3. Guthke J, Wigenfeld S (1992) The learning test concept: Origins, state of the art, and trends. In HC Haywood & D Tzuriel (Eds.), *Interactive assessment*. Springer-Verlag, New York.
4. Lidz CS, Gindis B (2003) Dynamic assessment of the evolving cognitive functions in children. In A Kozulin, B Gindis, VS Ageyev, & SM Miller (Eds.), *Vygotsky’s educational theory in cultural context*. Cambridge University Press, Cambridge, UK.
5. McAfee O, Leong DJ (2003) *Assessing and guiding young children’s development and learning* [3rd Ed.], Boston: Allyn & Bacon.
6. Ivanova AY (1976) *Obuchaemost kakprintsip otsenki ymstvennogo pazvitia u detei* [Educability as a diagnostic method of assessing cognitive development of children]. MGU Press, Moscow, Russia.
7. Rogoff B, Lave J (Eds.) (1984) *Everyday cognition: Its development in social context*. MA: Harvard University Press, Cambridge, USA.
8. Rubinshtein SY (1979) *Psikhologia umstvenno otstalogo snkolnika* [Psychology of a mentally retarded student]. Trosveshchenie Press, Moscow, Russia.
9. Feuerstein R, Feuerstein, R, Gross S (1997) The learning potential assessment device. In DP Flanagan, JL Genshaft, & P Harrison (Eds.), *Contemporary intellectual assessment theories, tests, and issues*. Guilford Press, New York, USA, 297-313.
10. Tzuriel D (2001) *Dynamic assessment of young children*. Kluwer Academic/Plenum Publishers, New York, USA.
11. Tzuriel D, Feuerstein R (1992) Dynamic group assessment for prescriptive teaching. In HC Haywood & D Tzuriel (Eds.), *Interactive assessment*, Springer-Verlag, New York, USA, 187-206.
12. Bodrova E, Leong DJ (1998) Scaffolding emergent writing in the zone of proximal development. *Literacy Teaching and Learning* 3(2): 1-18.
13. Spector JE (1992) Predicting progress in beginning reading: Dynamic assessment of phonemic awareness. *Journal of Educational Psychology* 54: 353-363.
14. Abbot S, Reed E, Abbot R, Berninger V (1997) Year-long balanced reading/writing tutorial: A design experiment

- used for dynamic assessment. *Learning Disability Quarterly* 20(3): 249-263.
15. Gillam RB, Pena ED, Miller L (1999) Dynamic assessment of narrative and expository discourse. *Topics in Language Disorders* 20(1): 33-37.
 16. Gindis B, Karpov Y V (2000) Dynamic assessment of the level of internalization of elementary school children's problem-solving activity. In C. S. Lidz & J. G. Elliot (Eds.), *Dynamic assessment: Prevailing models and applications*. JAI Elsevier Science Amsterdam, Netherlands.
 17. Kozulin A, Garb E (2002) Dynamic assessment of EFL text comprehension. *School Psychology International* 23(1): 112-127.
 18. Bodrova E, Leong DJ (2006) Vygotskian perspectives on teaching and learning early literacy. In D. Dickenson & S. Neuman (Eds.), *Handbook of research in early literacy development*. [Vol. 2], Guilford Press, New York, USA, 243-256.
 19. Grigorenko EL, Sternberg RJ (1998) Dynamic testing. *Psychological Bulletin* 124(1): 75-111
 20. Shepard LA (2000) The role of assessment in a learning culture. *Educational Researcher* 29(7): 4-14.
 21. Bodrova E, Leong DJ (1995) Scaffolding the writing process: The Vygotskian approach. *Colorado Reading Council Journal* 6: 27-29.
 22. Bodrova E, Leong DJ (2001) *The tools of the mind project: A case study of implementing the Vygotskian approach in American early childhood and primary classrooms*. Geneva, Switzerland: International Bureau of Education, UNESCO.
 23. Bodrova E, Leong DJ (2003) Chopsticks and counting chips: Do play and foundational skills need to compete for the teacher's attention in an early childhood classroom? *YC Young Children* 58(3): 10-17.
 24. Bodrova E, Leong DJ (2003b) Learning and development of preschool children from the Vygotskian perspective. In A. Kozulin, B. Gindis, V., Ageyev, & S. Miller (Eds.), *Vygotsky's educational theory in cultural context*. Cambridge University Press, Cambridge, USA, 156-176.
 25. Bodrova E, Leong DJ (2005) Vygotskian perspectives on teaching and learning early literacy. In D Dickinson & S Neuman (Eds.), *Handbook of early literacy research*. [Vol. 2], Guilford Publications, New York, USA.
 26. Bodrova E, Leong DJ, Paynter D E, Hensen R (2001) *Scaffolding literacy development in a preschool classroom*. Aurora CO: McREL.
 27. Bodrova E, Leong DJ, Paynter D E, Hughes C (2001). *Scaffolding literacy development in a kindergarten classroom*. Aurora, CO: McREL. *Communication and cognition: Vygotskian perspectives* Cambridge University Press, Cambridge, USA, 21-34.
 28. Elkonin D (1972) Toward the problem of stages in the mental development of the child. *Soviet Psychology* 10: 225-251.
 29. Perez MA (2009) La evaluacion psicologica: modelos, tecnicas y contextos. *Revista Iberoamericana de Diagnostico y Evaluacion Psicologica* 27(1): 9-28.
 30. Vilar M, Simoes MR, Lima MP, Cruz C, Sousa LB, Sousa AR, Pires L (2014) Adaptation and validation of the WHOQOL-OLD for the Portuguese population: Results of focus groups implementation. *Revista Iberoamericana de Diagnostico y Evaluacion Psicologica* 1(37): 73-95.
 31. Vygotsky LS (1981) The instrumental method is psychology. In JV Wertsch (Ed.), *The concept of activity in Soviet psychology*. M. E. Sharpe, Armonk, NewYork, USA, 134-143.