

A Journey from Psychometric Tests to Dynamic Assessment

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Abstract

Language testing is undergoing a paradigm shift. The prevalent psychometric models of language testing have been frequently reviewed and criticized for their limitations in providing enough information about the individuals' abilities. Progressive approaches, such as constructivism, which emphasize on the authentic assessment procedures; sociocultural approaches, which focus on the concepts like mediation and the zone of proximal development; and arguments for considering social dimensions, as well as fairness in language testing and assessments, have all paved the path for a promising paradigm shift. In order to focus on both the process and the product in language testing and assessment, some alternative assessment approaches have been suggested. Meanwhile, dynamic assessment (DA), an interactive testing - teaching model of psychological and psycho-educational assessment (Haywood & Lidz, 2007), has been rapidly evolving as an approach of interest as its theoretical foundations are promising for individual development through embedding instruction in the assessment procedures. The aim of this paper is to examine the available literature in order to understand why a shift in assessment procedures toward DA might be reasonable.

Key words: Psychometric models, product-oriented approach, process-oriented approach, alternative assessment, DA

1. Paradigm Shift

Assessment is traditionally an information gathering activity (Bailey, 1996) used to gauge a specific quantity of knowledge or progress towards that state. Naturally, as part of the assessment process with regard to schooling, data must be collected. Yet, in order to collect the type of data at the rate that progress monitoring now demands, students have begun to face what now appears to be an unprecedented number of exams and tests administered on a continuous basis. Thus, it is essential to consider the importance of testing vis-à-vis its inherent value, as well as its implications with regard to test score interpretation, and the possible social consequences of actual and potential test use (Messick, 1995).

Consider, for example, that summative assessments and test results, which are used to measure the culminating achievements of students, may have a profound effect on the learning experiences of students as external influences promoting either extrinsic or intrinsic learning (Kozaki & Ross, 2011). That is, consider that testing may potentially *support* learning, as well as measure it (Black & William, 2003). However, to consider any form of testing or assessment from this perspective requires quite a paradigm shift, yet given the problematic nature of excessive testing, considering the option that some forms of testing might have additional merit in terms of student learning beyond learning to pass the test, may be the revolution needed in the field of assessment in order to address the seemingly unsolvable problem of undue and increasing amounts of testing (Kuhn, 1977). Furthermore, after

overlooking the issues of utility, fairness, flexibility and relevance for more than a century, we may well be standing at the threshold of significant change (Wyatt-Smith & Cumming, 2009, p. xi). As such, there is a need to reconsider current assumptions and practices with regard to all dimensions of assessment.

In support of this, reflect that education exists to improve learners' knowledge, their understandings, and their skills; that it is for the development of the individual (Dewey, 1944). Further, education, with its eye always on the future, also helps individuals to take advantage of new and emerging forms of learning opportunities (Broadfoot, 2005). Yet, the significant roles of the learners in the educational settings have generally been ignored. Learning, ultimately, is constructed and controlled by the student (Dann, 2002) and if assessment is to give some fair indications of the learner's level of learning and development, in ways which will support development, the learner will need to come to understand and to contribute to the process of both learning and assessment. Thus, assessment methods should seek to focus on the process of learning rather than product of learning, and should recognize the fundamental centrality of the learner. To do so, however, there needs to be an attempt to make the role of the learner explicit rather than the current model in which the role of the learner remains implicit in relation to learning development.

This approach to paradigm shift in assessment rests on the view that learning is a social activity as per the work of Lev Vygotsky. Vygotsky's work in understanding psychological processes and cognitive development spawned a sociocultural perspective (Barnard & Campbell, 2005) in the learning sciences whereby the social context is at the heart of the learning process. One example of this, in language learning, is DA which involves the shared activity of teaching and learning based upon the engagement within the learner's zone of proximal development (Vygotsky, 1978, p. 85). In this paper, we consider the social aspects of testing as contextually relevant from an historical understanding of product-oriented to more process-oriented methods of assessment.

2. From Product-oriented to Process-oriented Assessment

In response to evolving conceptions of knowledge and its acquisition, and developing technologies for gathering and evaluating response data, assessment practices have changed a great deal over the past century. Not only have the forms of the data been changed, according to Mislevy (2003), but also the conceptions of what the assessment data should include, how the collected data should be interpreted, as well as the kind of inferences made.

There have been many changes in the methods of systematically assessing students' academic knowledge and skills over the years (Shohamy, 2001). However, there has not been much movement in how students' cognitive schemata, schooling environments, and backgrounds impact their test scores and experiences. That is, the inferences made about their academic achievements and learning is not fairly valid. And, as Walters (2012, p. 474) suggests, in regards to fairness and validity, "it is reasonable to assume that test bias will be a continual concern as long as unequal societal and educational divisions continue, as along gender, ethnic, or racial lines". This is troubling because, as we know more about the different ways students learn, access knowledge, and develop skills, we know that scores can sometimes mean totally different things (Kopriva, 2008).

Psychological stances underlie the different implications for assessment argument which may have provided the foundation for shifts in assessment tools. Mislevy (2003) provides a summary of the four major schools of thought that have influenced views of testing and validation during the last century. The first one is a trait perspective in which hypothetical and unobservable numbers are proposed to locate people along continua of mental characteristics, just as their heights and weights locate them along continua of physical characteristics.

The second school of thought is the behaviorist perspective. In this school, knowledge is the components of skills collected through stimulus-response associations. Assessments designed from this school of thought, such as traditional criterion-referenced tests estimate the probability of success in a domain based on the comparative agreement with the number of knowledge bits a student has mastered. The third school is based on the information-processing perspective. The information-processing perspective examines the procedures by which people acquire, store, and use knowledge to solve problems. According to Mislevy, the assessment design considers both task features and student performances. Inferences, arising from this school of thought, are made in terms of concepts and problem solving strategies rather than indirectly in terms of features of problems as an expert sees them.

The fourth is the sociocultural perspective. A sociocultural perspective stresses how the knowledge is conditioned and constrained by the technologies, information resources, representation systems, and social situations with which they interact. Contextualizing assessment exercises, according to Greeno, Collins, and Resnick (1997), decreases the

assessor's control and increases the burden on the specification of distinct features of performances and performance situations.

It is not appropriate, however, according to Kopriva (2008), to measure the academic content of English language learners using tools which are not designed to provide valid and useful data about the students. More importantly in the era of increased accountability, the academic findings of the students should be fairly represented. In addition, traditional testing techniques, e.g. multiple-choice, fill-in-the-blank, matching, etc., are not appropriate to the current second/foreign language classroom practices because the descriptive information needed to plan instructional strategies cannot be obtained through the limits of these conventional testing methods (Barootchi & Keshavarz, 2002).

An illuminating point may be realized via the two value systems presented by East (2007): the product-oriented value system and the process-oriented value system. The product-oriented value system, which is rooted in traditional behaviorist knowledge-based approaches, is concerned with the static assessment of students' learning. Summative tests that take place at a particular moment in time and provide a one-time snapshot of the test takers' abilities are the customary approach. On the other hand, the process-oriented value system is influenced by constructivist approaches. Constructive approaches, according to Meltzer and Reid (1994), represent learners as active processors of information who develop their own theories and ways of understanding through selecting, organizing, and connecting. This perspective favors a more sociocultural approach to testing such as DA and is more learner-centered and flexible. The process-oriented value system informs a theory of measuring students' attainments that has become known as 'assessment for learning'. This approach is embedded within teaching and learning context and helps to move learners from a lower to a higher level of proficiency in ways that enhance learner autonomy and learner motivation.

The shift away from a positivist (scientific) view point in second language education involves a move from the main principles of behaviorist psychology (Jacobs & Farrell, 2003). In acceding to this shift a progression towards the "cognitive, and later, socio-cognitive psychology and more contextualized meaning-based views of language" emerged (Jacobs & Farrell, 2001). It is, not surprisingly, coupled by a move from product-oriented to more process-oriented instruction and assessment (East, 2007). Interaction which is of great value in process-based assessment approaches has no role in product-based traditional assessment procedures. The only time interaction is considered in traditional assessment approaches is in estimating the relationship between test scores and student abilities on the targeted constructs. This is fine when ancillary abilities (Kopriva, 2008) do not interact with how the students perform on items meant to measure targeted content. However, the ancillary abilities of test takers, especially English language learners, normally impact how they answer items.

Traditionally, the approach to assessment was a product of behaviorist assumptions about the nature of knowledge and learning. Consequently, standardized tests solely focused on memorization of isolated bits of factual knowledge and procedures that could be easily retrieved on tests composed largely of multiple-choice items (Frederiksen, 1984). In such product-oriented approach the important aspects of cognition and learning such as conceptual understanding, reasoning, and complex problem solving were often ignored.

Currently, examinations and other forms of assessment are commonly used for the certification of competence, to monitor educational standards, and to serve as an important social function in selection. Assessment procedures must, then, be capable of providing data to determine achievement across a very wide range of content and skills. Assessment procedures must also have the capacity to engage students from diverse cultural and personal backgrounds, and to offer a fair means of judging students with disabilities and other kinds of special needs. Not surprisingly, there is increasing interest in the potential of assessment procedures that can address these requirements and alternative assessments are being brought into play for the extent to which they can measure variety in cognitive capabilities across the scope of humanity. As Pellegrino, Baxter, and Glaser (1999) insist, it is crucial to create instructional activity that enhances learning outcomes and opportunities for *all* students. In addition, alternative assessments of learning and achievement can be designed to provide useful information to teachers and learners to reflect on in order to consider the content and skill to be studied or taught in order to improve performance. "In this respect, the concept of assessment for learning as opposed to assessment of learning, has emerged" (Davies & LeMahieu, 2003, p. 142).

3. Alternative Assessment

It has been more than a half century that practitioners have voiced the limitations of traditional psychometric assessment procedures in measuring the students' performance and achievements at the end of educational courses. Assessment reform movements have resulted in the emergence of diverse assessment procedures (Berry & Adamson, 2011). Although the procedures of the administration of the novel approaches may be difficult and more time-consuming, the advantages cannot be ignored. Following the reactions against the limitations of traditional psychometric assessments, current trends are no longer based on the view that language learning entails a passive accumulation of skills (Hamayan, 1994). The informative data collected during procedures in alternative approaches provide a valuable context for a more valid interpretation of all standardized test results.

Bailey (1996) argues that because of the probable inherent errors existing in tests, it might be dangerous to rely on a single traditional test score as the basis for passing a course. She also notes that teachers are increasingly questioning the authenticity of the traditional forms of testing as measures of the learner capability. To that end, drawing on the work of several scholars, Herman, Aschbacher, and Winters (1992, p. 6) have devised a list of features that various forms of alternative assessment have in common. In their view, alternative assessments:

- require students to perform, create, produce, or do something;
- tap into higher level thinking and problem-solving skills;
- use tasks that represent meaningful instructional activities;
- approximate real-world applications;
- ensure that people, not machines, do the scoring, using human judgment;
- call upon teachers to perform new instructional and assessment roles.

Furthermore, Huerta-Macías (1995) suggests that alternative assessments

- are nonintrusive in that they extend the day-to-day classroom activities already in place in a curriculum,
- allow students to be assessed on what they normally do in class every day,
- provide information about both the strengths and the weaknesses of students, and
- are multi-culturally sensitive when properly administered.

Thus, alternative assessment in general seems to be very much grounded in context, being authentic and often performative in nature. Yet, this is not necessarily 'new' to language teachers. As Brown and Hudson (1994, p. 657) note language testing practices are fundamentally different from assessment practices in most other disciplines, not only because of the complexity of the domain being tested but also because of the different types of tests that language teachers and administrators can and do use. In other words, it is common for language teachers to use various types of language tests, including what might appear to be alternative assessments. However, despite the range of options, it is neither the tools nor the tests themselves which offer the 'alternative assessment'. It is the value in the selection process, as well as the product that the teacher can carefully match to the individual in order to craft the assessment to the individual. Fundamentally, the strength of alternative assessment lies in the ability to individualize the assessment (McNamara & Roever, 2006) to mimic good teaching practices, and to involve teachers more deeply in the assessment process.

4. Alternate Modeling

An alternative model to the static psychometric model of assessment is a more dynamic one in which the student's learning potential, or capacity, is the focus (Gipps 1994, p. 30). Not only is it of interest to assess what the student already knows, but it is fundamental to also understand the student's learning strategies, their ability to be aware of their learning, and their ability to have control with regard to their learning. An interactive or mediated assessment can indicate not only what a student knows, but can also reveal what they can nearly do with regard to strategies, metacognition, and regulation of learning.

McNamara (2001) states that making the needs of learners a priority represents an alternative approach to assessment, rather than an 'alternative assessment'. He argues that any deliberate, sustained and explicit reflection by teachers and learners on the qualities of a learner's work can be thought of as a kind of assessment. In this approach teachers and learners are engaged in systematic reflection on the characteristics of an individual performance as an aid to the formulation of learning goals in a variety of contexts. During the assessment activity the teacher is not involved in the comparison of performances of different individuals, although a comparison can inform the awareness of the characteristics or features of difference.

In such assessments there is no interest in finding out who is relatively better or worse. Performance is not considered against any particular yardstick rather performance is viewed in terms of the individual's development as

per a sociocultural theory of human development. Yet, as McNamara (2001) notes, this kind of assessment activity necessarily involves record keeping and reporting to fulfill managerialist agendas. He adds that there is an ongoing need for assessment to respond to the theoretical challenges presented by advances in validity theory and in the epistemological upheavals in the social and behavioral sciences. It is the continuing effect of a 21st century post-modern interrogation of knowledge verses the old positivist stand-by of a rationalist-scientific knowledge.

Nonetheless, regarding a call for movement in educational measurement, Bachman (2000) concludes his discussion on 'modern language testing at the turn of the century' saying that developments in language performance assessment, provided by related developments in language teaching and educational measurement, have resulted in a better understanding of the nature of the methods, or tasks that we use to elicit performance in language assessments. He also notes that this has led to a better understanding of the ways in which we can design, develop and use such tasks and evaluate their usefulness and more importantly, enriching the store of alternatives in language assessment.

In many ways, development in language assessment attempts to address the complexity of language in the assessment of language use (Hudson, 2005). It reflects a current appetite for language assessment anchored in the world of functions and events. Hudson believes that these developments interact to promote language assessment that recognizes the need to expand beyond a tradition that has focused on language primarily as a decontextualized cognitive skill or ability (Cumming & Maxwell, 1999). Language takes place in a social context (Murray & McPherson, 2006), as a social act, and this needs to be recognized in language assessment. Consequently, much of the recent innovative research in language assessment in relation to DA and mediated or co-constructed assessment tasks (Shohamy & Hornberger, 2008).

4. Dynamic assessment

While the limitations of the scientific approach to assessment are being increasingly recognized, it is not surprising to observe a growing interest in applying alternative assessment approaches. One such approach, DA, involves the active engagement of both learner and teacher in a process-oriented assessment framework that engages the participants in within the learner's zone of proximal development. By working within the zone of proximal development, DA can now be a reply to some of the questions being asked such as those put forth by Gipps (1994, p. 27) "What form of assessment do we need to properly reflect students' learning? and What form of assessment should we use to ensure a beneficial impact on teaching and learning practice?"

DA is grounded in Vygotsky's sociocultural theory and as such engaging in DA incorporates the view that learning, culture and development are inseparable. Operationally, DA provides a kind of instructional intervention referred to as mediation (Vygotsky, 1962, 1978; Poehner & Lantolf, 2005). In mediation, the more knowledgeable other or teacher offers minimal hints to support and direct the learner as the learner completes a task that is beyond their capacity to some degree. During the process the teacher can see and record just how little or how much assistance was needed by the learner to complete the task. Thus, the purpose of mediation in DA is to reveal the depth of learners' abilities (Poehner, 2007). This in turn is part of what the learner, too, discovers. According to Murphy (2008), DA is a reply to the need to somehow assess and assist low performing individuals. However, it can be used with individuals of any background and of any ability.

Implementing DA has advantages over NDA or static methods of assessment. Most notably, Sternberg & Grigorenko (2002) distinguish that in DA the focus is on the future and on promoting the development of blossoming abilities whereas in NDA the focus is on the past, on what has already matured. Some of the advantages of DA have been listed in Table 1.

As to the foundations of DA, many give Vygotsky credit due to his conceptualization of the zone of proximal development and mediation with regard to cognitive and affective development based on sociocultural theory. However, both Vygotsky and Feuerstein are recognized as equal co-contributors to the field (Murphy, 2008). Antón (2012) notes that "DA was first articulated and developed by Feuerstein and his colleagues in the early 1950's" (p. 107). Both Vygotsky and Feuerstein believe that human beings are not static entities, but are always in states of transition and engaged in transactional relationships with the world. It is in these transactional relationships that cognitive and affective growth may result. Thus, teacher and learner both have a part to play in the learning process. In DA it is assumed that if learners have central role in the learning process through their cognitive interactions, their roles should be equally of great value in the assessment procedures. The learner cannot be regarded in isolation from others.

This process through which social interaction influences learning may be considered analogous to an apprenticeship model of learning (Dann, 2002) whereby the novice learner works alongside an expert in the zone of proximal development. Here, as in DA, it is always social interaction that is the premise for learning and it is social interaction that also promises development during the process of assessment.

Implementing DA along with other forms of assessment provides a valuable part of the assessment repertoire. The DA portion of the assemblage is necessary in that it can add substantial information about both present and potential performance that is not readily obtainable from other sources. DA assists teachers in reorienting their practice towards the goal of supporting learners. The mediation provided may provide an indication of time and resources that might be needed to move individual development forward. Standard assessment procedures are not sufficient for estimating a student's learning potential and provide little help in identifying the conditions under which progress may be made (Cioffi & Carney, 1983).

Kozulin and Garb (2001) have also found DA procedures to be both feasible and effective in obtaining information on students' learning potential. They confirmed that the paradigm of dynamic assessment is useful not only in the field of general cognitive and affective performance but also in the EFL learning domain.

6. Summary

The role of assessment in history has been primarily in its use for selection. So called intelligence tests, for example, emerged as a means of evaluating and cognitively classifying individuals, then grouping them and according them a socially constructed label for the purposes of organization in a given society. Indeed, assessment for selection and certification has had a key social role to play in most societies (Gipps, 1999). According to Broadfoot (1996), assessment in developed societies, whether for selection or certification, has had a single underlying rationale: to control mass education and the nature of its goals and rewards. She points out that individuals compete on an equal basis to show their competence. This assumes that the assessments used are valid in their measurement. Post-modern times challenge this notion, however, and fundamentally the challenge is whether the assessment is more concerned with categorization "than with developing a common understanding through dialogue about when learning occurs" (Hargreaves, Earl, & Schmidt, 2002, p. 76).

In this regard, Bernstein (1996) emphasizes on the need for a change from overt to covert assessment. Overt or objective assessment is based on specific criteria, precise measurement, and standardization, which purportedly allows for comparison among students and evaluating their progress based on a positivist understanding of the world. Yet, this objectivity lends a sense of legitimacy to the assessment. In contrast, Bernstein argues that assessment is covert and not precise enough to make direct comparisons between the students. Overt assessment is potentially controlling rather than progressive and liberating.

Organizations such as Teacher Training Agency in the UK are suggesting that the teachers' overarching task now is to provoke excitement in students not just about, but in the complex world of learning (Dann, 2002). That is, the learner is no longer to be a mere receptacle (Freire, 1970) for the insertion of tightly prepackaged knowledge; they are to be active participants in authentic learning.

"Unless the fire be lit in the mind and spirit of the students, it will be something less than that promised in such a learning experience" (Dann, 2002, p.). In other words, if individuals do not interact cognitively and affectively with their environment, learning will not occur. This perspective, according to Dann, places considerable emphasis on the role of the learner in the process of learning. As such, McNamara and Roever (2006) suggest responsibility of both candidates and test score users in the procedures for validation of test score inferences becomes imperative. They argue that within the discourse of psychometrics limits, what can be said about the social dimension of language testing is that it lacks a theory of the social context in which tests have their function.

The role of the social context is in evidence in Vygotsky's zone of proximal development, which is characterized by the independent performance of an individual in comparison to his or her performance when assisted by a more knowledgeable or older peer. The difference in performance is thus attributed to the development evident in the individual's zone of ability when aided by a more competent peer (Haywood & Lidz, 2007). Not surprisingly, the zone of proximal development is at the heart of sociocultural perspectives and defines the dialogic nature of teaching and learning processes (Nassaji & Cumming, 2000). According to Lantolf and Thorne (2006), sociocultural theory is most compatible with theories of language in that they are focused on communication, cognition, affect, and meaning, merging with a theory of mediated mental acts that lead development. These acts occur when the learner and the "more knowledgeable other" are engaged in moving the learner forward in his or her problem solving.

As previously indicated, human learning is a dynamic social activity that is situated in physical and social contexts, and distributed across persons, tools, and activities. Final assessment examinations are the most widely used testing methods in educational settings with the main concern behind this product-oriented testing being that teachers examine the students' progress on materials they have been taught after certain amount of time (Özgür, 2008). In order to understand learning and development according to Vygotsky (1978), however, focus should be on the process rather than product. Likewise, Lantolf and Thorne (2006) concur that the only appropriate way of understanding and explaining forms of human mental functioning is by studying the process of their development, and not the outcome of development. Development arises in the dialogic interaction that occurs among individuals and it is the interactive nature of development, as indicated in Vygotsky's theory of proximal development, which views the child (or a learner) as developing within a sociocultural context (Murphy & Maree, 2006). In point of fact, development is the result of interaction and in order to measure the development one needs to assess the individual in interaction.

7. Final Remarks

Vygotsky's view of learning as a shared-joint process in a responsive social context, and his reflection of learners as far more competent performers when they have proper assistance have all been the foundation of the promising interactive assessment of DA, not just a transient fad. As such DA might truly be the commensurate reply to many concerns: To Freire (1970) and the disdain for the 'banking concept' of education, to Messick (1984) and concern for 'social consequences', to Shohamy (2001) with regard to 'democratic assessment', to Mislevy (2003) in terms of 'a need for evidentiary reasoning', to Broadfoot (2005) who cautions of danger of making decisions in 'dark alleys and blind bends', and to Rea-Dickens and Gardner (2000) and their concern with 'silver bullets and snares'.

Perhaps, the most illuminating and commendable feature of DA is the analysis of the information gained through its interactive procedure following a test-intervention- retest format. This information, which is not readily available through standardized testing but crucial for effective remediation, is the definitive goal of DA. Hence, it is hoped that DA will find wider application in educational settings.

Indeed, the role and ultimate goal of DA is to suggest what is needed to defeat the pessimistic predictions that are often made on the basis of the results of standardized normative tests. In order to produce significant improvement DA suggests the kinds and amount of intervention needed. In other words, an individual learner's potential for future development by embedding instruction in the assessment process itself.

8. References

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Table 1. DA and NDA comparison (Naeini & Duvall, 2012)

DA	NDA
<ul style="list-style-type: none"> • It is process-oriented. • The learners' developmental changes are tracked and supported. • Learners become more responsible for their own learning. • The examiner takes active role during the testing situation (Anton, 2009). • The teacher acts as facilitator of language-processing and problem-solving techniques. • The student learns to become an active user of self-monitoring strategies to regulate their own understanding. • The goal is to enhance students' conceptual understandings and to produce more insightful intentional learners. (Campione, 1989) 	<ul style="list-style-type: none"> • It is product-oriented. • Learners are not supported. • These tests are not designed to evaluate specific instructional strategies for remediating learning deficits. • The examiner is neutral. • Opportunity to directly influence learning is overlooked within the context of traditional assessment. • Traditional assessment does not recognize the learner's potential to succeed with adequate environmental support. • The assumption underlying these tests are: All the students have had the same opportunities to acquire the information and skills probed in the tests (Campione, 1989)

As the table indicates, DA is concerned with the process of learning rather than the product. Therefore, the learners' movement and development are traced. However, there is no such regard in NDA approaches. In DA, there is an attempt to make learner aware of his or her own learning, which is an indication of Vygotsky's movement toward self-regulation. Apparently, in such an approach the learner plays an active role in his or her own learning. In NDA approaches, there is no attempt on the part of the assessor to facilitate learning.