Review Article

The Psychology of Learning and Assessment: A Review of the Three Major TheoreticalPerspectives

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Abstract

The theoretical perspectives to learning and assessment influence the activities of practitioners in education. This review article discusses three theoretical perspectives which informabout human learning and assessment. The theories discussed are the behaviorist, the cognitive-constructivist, and the social-constructivist. Each of them originates either from Aristotle's Empiricism or from Plato's Rationalism of knowledge acquisition and construction. The first assumes the bond between a presented stimulus and the learner response as an indicator for effective learning. The assessment practice in this case considers the probability of correct responses. The second assumes the human mind to be active and powerful in changing the knowledge structure through the process called assimilation or accommodation. Hence, the assessment focuses on the transfer of knowledge from the context it was learnt to a new context of knowledge application. In the third perspective, the acquisition and construction of knowledge include ideas about culture, social learning, and cooperation. Learning is a collaborative action. That means, learners participate in establishing goals of learning, peer learning, group learning, peer assessment, and group assessment. The objective of this review is to raise the awareness of practitioners in the field of education. The review followed the method of content analysis by identifying key literature in the area of learning theories. Then, comparison and analysis of the theories were made to see the way each of them positioned learning and assessing. Therefore, teachers at the different levels will depend on the respective learning and assessment perspectives to devise learning and assessment environments which facilitate effective student learning.

Keywords/phrases:/Assessment/Enhancementof learning/Learning environment/Learning experience/

1. Introduction

Educators define learning as a behavior change or capacity for behaving "in a given fashion which results from practice or other forms of experience" (Ertmer& Newby, 1993, p.53). The available literature presents different concepts on learning. These concepts guide the discussions and activities of learning and assessment. Moreover, the conceptualization about learning influences educator's view of assessment practices (Careless, 2008), because learning and assessment are logically intertwined (Yorke, 2003). There is also an increased acknowledgment to the interactions between classroom learning and assessment (Peter, 2007, p.18). Thus, learning and assessment are inseparable.

Early viewpoints on the epistemology of knowledge and learning have significantly influenced the current perspectives of learning and assessment (Hulse, Egeth, & Deese, 1980). Aristotle's association's view (empiricism) stresses the basic human sensations as gateways of knowledge and learning. According to this view, organisms are born with no knowledge (mind as *tabula rasa*). Learning occurs by taking the basic sensations and connecting them mechanically to make sure that they are hooked together contiguously in time or in space. This philosophical view of learning became an origin for stimulus — response or behaviorist learning theories of J.B Watson, L. Thorndike, and B.F Skinner (Ertmer & Newby, 1993).

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In contrast to the above beliefs, Plato's rationalist view (nativism) postulated that all knowledge is unlearned and an inherent part of the organism at birth. Learning is an illusion, a simple failure to remember what was already in mind. This 'nativist' position holds that much of the capacity for learning is innate or it is part of the genetic makeup of a species and is relatively independent of any particular experience that occurs after birth. However, modern thinkers of this line do not go as far as Plato. They maintain that in many situations organisms are born with an innate tendency to structure, perceive, or react to the various events that occur after birth in a rather predetermined fixed way. Chomsky's analysis of the acquisition of language (LAD) can be a good example for this. The predisposition to talk and learn a language, and to do so according to a certain particular grammatical rules, is an inborn characteristic of the human species.

The twentieth century is marked by the contributions of different thinkers to explain about human learning. In the early 20th century, learning was believed to result from behavioral responses. For instance, E.L. Thorndike at Colombia University was a popular figure with regard to his contribution to understanding human learning (Shrock, 1991). According to Thorndike, learning should pursue pre-specified and socially useful goals. Moreover, he was a strong advocate of educational assessment that mainly focuses on mastery of the learning content by the learner (Shrock, 1991).

The 1920s were known for the objective movement in education. For example, Franklin Babbitt introduced the idea of educational objectives and individualized instruction. According to him, schools should provide experiences specifically related to those activities demanded from citizens by their society (Shrock, 1991). Furthermore, Babbitt thought educators could derive the goals of schooling from an objective analysis of the skills necessary for successful living. The specification of learning goals together with the practice of assessment led to the concept of mastery learning (Ertmer & Newby, 1993).

In the 1930s, Ralph W. Tylor introduced the specification of objectives in terms of observable and measurable behavior of the learner; therefore, the objectives and their assessment help to revise and refine the curriculum until it produces an appropriate level of mastery (Shrock, 1991). Though the phrase would "not be coined for almost thirty-five years" until the time of Michael Scriven (Shrock, 1991), instructional designers recognized this practice as formative assessment.

The 1950s was known for the notions of programmed instruction and task analysis through the contribution of B.F. Skinner. Skinner suggested that human learning could improve with the application of reinforcement to the desired learning behaviors or responses. Hence, according to Shrock (1991, p. 14), "clearly stated behavioral objectives, small frames of instruction, self-pacing, and active learner" responses to questions and immediate feedback regarding the correctness of responses characterize programmed instruction. In terms of this view, learning is a change in behavioral disposition that educators shape the desired behavior by selective reinforcements (Jonassen, 1991). According to Jonassen (1991), the perspectives about learning have undergone a major revolution since the 1950s. Theories and models of learning from cognitive psychology are becoming common in explaining the learning process (Gardner, 1985). As Jonassen (1991, p.6) explains, cognitive psychology assumes "learning to be concerned not so much with behavioral responses, but rather with what the learners know and how they come to acquire it." Because of this competitive view of human learning and the introduction of the constructivist paradigm, the perspectives about human learning and assessment have shown significant changes after the 1950s.

Educators are expected to translate the conceptualizations of learning into the design and implementation of learning environments and assessment practices. Conceptualizations of human learning and their implications for assessment are becoming more complex. Even though the theories informing learning and assessment are relatively diverse, researchers argue that educators often base their practices on the behaviorist perspective of learning (Smith & Ragan, 1993).

Teacher dominated classrooms are common at all levels of education. Studies on teachers' role reveal two possibilities as knowledge transmitter and/or the facilitator of learning. In the context of the Ethiopian education, to the knowledge of the reviewer, reviews on the theoretical perspectives of learning and assessment are not organized and documented. Therefore, it is important to recognize and discuss the implications of the leading learning theories and their influence on the activities of student learning and assessment. Thus, this review of article will have salient contribution in raising the awareness of educators to consider the theories of learning while planning and

implementing learning and assessment environments may significantly enhance student learning. Hence, the research questions of this review article intend to answer are:

1. What are the major theoretical perspectives informing the design of learning and assessment environments?
2. What are the differences among the theoretical perspectives?
3. Which of the theoretical perspectives are effective to create learning and assessment environments that can enhance student's learning?

2. Review of Theories of Learning

The psychology literature on the theories of learning labels these perspectives as the "behaviorist," "cognitive-constructivist", and the "socio-cultural" perspectives respectively.

2.1 Behaviorist Perspective of Learning and Assessment

Behavioral perspective of learning emerged in the early decades of the twentieth century and was dominant until the 1970s. Behavioral views consider learning a systematic association of events called stimuli and responses. Within this perspective, the "observed behaviors of the learner" as well as the determination of observable and measurable behavioral objectives before the instruction are the foci (Reiser, 1987). There is a tendency to match the objectives and their assessment until the learner achieves the appropriate level of mastery (Shrock, 1991). Psychologists and educators used to call this "mastery learning." Within this perspective, the dominant mode of teaching follows the transmission approach. The students' involvement rarely becomes active, both with regard to the learning and assessment activities. In effect, the role of the lecturer is to present the contents of the course and construct assessment tasks that require students to respond to questions based on the presented contents. Jonassen (1991) and Ertmer and Newby (1993) equate such learning with behavioral outcomes which tend to place little emphasis on the role of mental operations or cognition. Jonassen (1991) regards this perspective of learning as "objective."

The behaviorist perspective of learning does not consider the experience and individuality of the learner very well. It assumes that teachers or technologies transmit the knowledge to be acquired by learners (Jonassen, 1999, p. 217). Learning occurs when the learner demonstrates the proper responses following the presentation of a specific environmental stimulus or learning content (Ertmer & Newby, 1993, p. 55). In this perspective, the key elements in learning and assessment process are the stimulus, the response, and the association between the two.

The association between the stimulus and the response can be strengthened using instructional cues, practice, and reinforcement. However, as Schunk (1991) puts it, the learning of higher-level cognitions such as language development, problem solving, and inference generating and critical thinking is not clarified by the behavioral view of learning. This view of learning considers assessment an action of the learner in exercising proper responses to the learned content (Ertmer & Newby, 1993). Because of this, students may lack the opportunity to develop alternative conceptualizations of knowledge.

The focus of assessment procedures in terms of the behaviorist perspective of learning is to examine the observable behavior of the learner as an evidence for the acquisition of the intended learning objectives. The assessment tasks by large check for the facts learned and the recognition of events rather than the learner's conceptual change and development. As described by Gipps (1994) and Biggs (1998), in terms of the behaviorist view of learning and practice, assessment tasks seem to function as instruments for checking whether the learner has received, absorbed, and memorized the presented content during instruction. The scoring of exams emphasizes the correctness and incorrectness of student's responses to questions. Feedback to learners is often limited to show an incorrect answer or the correct answer with little guidance on how to progress in improving learning (Peter, 2007).

2.2 Cognitive - Constructivist Perspective of Learning and Assessment

The behaviorist perspective of learning discussed in the above section gives little regard for the active nature of human mind. Learning is, by and large, a behavioral disposition of an individual that can possibly become shaped by selective reinforcements. This little regard for the human mind and cognition in the learning process was the primary theoretical cause for the paradigm movement in the learning psychology (Jonassen, 1991, p.6). In the mid of the 20th century, the Swiss psychologist Jean Piaget came up with a theory of human cognition development. Piaget proposed human cognitive development to happen into four qualitatively different stages such as sensory-motor, preoperational, concrete operations, and formal operational thinking (Shrock, 1991). According to Ertmer and Newby (1993, p.58), cognitive views of learning have emphasized with "what learners know and how they acquire knowledge" rather than probabilistic observable responses. Regarding the shifting conception of learning from behavioral responses to cognitive processes, Ertmer and Newby (1993, p.57) point out the following:

> In the late 1950s, learning theory began to make a shift away from the use of behavioral models to an approach that relied on learning theories and models of the cognitive sciences. Psychologists and educators began to de-emphasize a concern with overt, observable behavior and stressed instead more complex cognitive processes such as thinking, problem solving, language, concept formation, and information processing.

The cognitive perspective of learning regards the learner as one who actively interacts with the environment to acquire knowledge, skill and competencies. However, this view of learning has limitations due to the inconsistent assertions to the meaning of the mind. In fact, whether the mind is a material entity controlling the actions of the knower, or something spiritual was controversial (Jonassen, 1991). Cognitive psychologists such as Jean Piaget considered the mind or mental constructions as representations of the real world through which the learner assimilates or accommodates information (Bruner, 1986). As stated by Ertmer and Newby (1993), cognitive perspective of learning regards learning as discrete changes between states of knowledge (schema) rather than with changes in the probability of responses. For cognitive psychologists, learning occurs when the memory stores information in an organized and meaningful manner. As a result, the assessment for learning relies more on checking the learner's ability to retrieve information and use it in a new context (Ertmer & Newby, 1993).

On the other hand, contemporary cognitive theorists challenge the above conceptualization because of its emphasis on objective reality that is represented in the learner's cognition or mental structure (Jonassen, 1991). These theorists suggest an individually constructed version of reality. This perspective led to the conceptualization of learning through the lens of constructivism. Murphy (1997, p.4) proposed: "...whether we see knowledge as absolute, separated from the knower, and corresponding to a knowable, external reality or whether we see it as part of the knower and relative to the individual experiences with the environment, have far-reaching implications for learning and assessment".

According to Jonassen (1991, p.10), the constructivist perspective claims that reality... dwell[s] more in the mind of the knower, that the knower constructs a reality, or at least interprets it based on his/her perceptions and experiences. This is based on Piaget's proposition of knowledge construction through the process of assimilation and accommodation. Jonassen (1991, p.11) indicates that constructivist learning paradigm has the most direct implications for changes in teaching and assessment. According to this perspective, knowledge is neither passively received nor mechanically reinforced; instead, it occurs by an individual's active process of sense making (Sheppard, 2000, p.16).

Constructivists believe that learning occurs when learners encounter new experiences and concepts and seek to assimilate these into their existing cognitive structures or adjust the schemas to accommodate the new information (Ray, 2001, p.319). Learning occurs, not by recording information but by interpreting it (Resnick, 1987).

In the words of Evan and Tirosh (2002), constructivism assumes the creation of knowledge through an active process of construction, rather than passive assimilation of information or rote memorization. In fact, constructivism is a theoretical framework rather than a specific model of learning design. Jonassen (1991) argues about the difficulty of conceptualizing constructivism. Therefore, constructivism considers knowledge conceptual structures, which the learner adapts to the range of his/her experiences rather than a representation of an independently existing real world (Anthony & Walshow, 2003). With respect to this point, Colliver (2011, p.50) asserts the following:

> .... Constructivism shifts the view of knowledge from historical, eternal truths-which would seem to focus curricula on current knowledge, the truth, and the real-to historical, cultural inventions-that are changing and evolving, making the meaning of current knowledge more dependent on where we have been.

Thus, constructivism recognizes learning as a process of conceptual growth and cognitive abilities such as problem solving tactics and metacognitive processes (Peter, 2007). Though educators have increasingly accepted constructivism, translating it into practical instructional tactics has proven to be difficult for teachers (Ray, 2011, p.319). Jonassen (1991) assert that constructivism failed to establish the implications well enough to support a prescriptive theory of learning. In fact, it has challenged the existing teaching and assessment activities.

Theoretically, the teacher's role is limited to guiding and coaching students to move from being novice learners to being expert learners. In the process of learning, the teacher needs to prepare learners to regulate their learning by creating supportive rather than directive learning environments (Jonassen, 1991, p.13). The assessment tasks should involve self-reflections by learners, self-assessment, peer assessment, self-regulation skills and useful feedback from the experienced coach who is the teacher or the peer. Besides, to evaluate the learners' current level of knowledge and understanding, educators could design assessments to scaffold future learning (Peter, 2007). According to Wilson, Teslow and Osman (1995, pp. 153-154), in constructivist learning environments, student assessment incorporates assessment into the teaching product, analyses and discusses products grounded in authentic contexts, evaluates processes as well as products, and utilizes informal assessments within the classrooms and learning environments.

2.3 Socio-cultural Perspective of Learning and Assessment

Although Piagetian versions of constructivism emphasized individual developmental stages or processes earlier, over time, cognitive psychologists have come to take the influence of social processes more seriously (Sheppard, 2000, p.19). A constructivist paradigm of learning tends to accommodate multiple perspectives (Wilson, Teslow & Osman, 1995), because it is a broad theoretical framework rather than a specific model of design. Jonassen (1991) argues about the difficulty of conceptualizing constructivism.

The early conception of constructivism emphasizes thinking at an individual level (Wilsow, Teslow & Osman, 1995). At the other extreme is the socio-cultural conception of constructivism that incorporates more ideas about culture, social learning, and cooperation (peer learning). As Sheppard (2005, p.18) asserts, cooperative "learning contributes to students' active engagement and helps to develop valuable peer and self-assessment skills." Based on the explanation of Merill (1991, p.49), ideas such as experience as source of knowledge, learning as an active and personal interpretation of the world, learning as collaborative and situated in real contexts, and integration of assessment tasks characterize constructivism.

Moreover, Wilson, Teslow, and Osman (1995, p.141) add other points to characterize the socio-cultural constructivist perspective of learning. These are reflection as a key component of learning to become an expert, like instruction, assessment should be based on multiple perspectives, and learners should participate in establishing goals, tasks, and methods of instruction and assessment. These latter points are parallel to the assumptions of formative assessment mentioned by Sadler (1998). However, we have to note that the socio - cultural viewpoint of learning and assessment accommodates multiple perspectives. For instance, regarding the multiple perspectives of socio-cultural learning, Wilson, Teslow, and Osman (1995, p.147) state the following:

> ....not all students share the same learning goals; not all students' learning goals converge completely with instructional goals; students have different styles of learning, different background knowledge. Rather than ignoring these differences, instruction should acknowledge the evolving nature of knowledge and encourage students to engage in a continuing search for improved understanding. This plurality of content, strategies, and perspectives typifies postmodern approaches to instruction.

The socio-cultural perspective of learning and assessment considers human cognition intrinsically social and situated. According to socio-cultural theory, students develop cognitive abilities through social interactions that lead them to trying out language and practicing their reasoning (Sheppard, 2005). The main interests in this perspective are the kinds of social activities that facilitate the proper context for learning to take place (Evan &Tirosh, 2002, p.232). In contrast to the de-contextualization and decomposition of knowledge fostered by behaviorism, it is difficult to understand any aspect of knowledge separately from the whole or from its social and cultural context (Sheppard, 2000, pp.19-20). Educators generally regard peer assessment and formative feedback as social engagements which may contribute to the improvement of student learning as a group and individual. As Sheppard puts it, socio-cultural theory holds together an understanding of how student...learn and at the same time how they develop identities as capable learners. He also goes on to say: "When implemented by experienced teachers, formative assessment practices further cognitive goals and at the same time draw students into participation in learning".

According to Anthony and Walshow (2003), a socio-cultural view of learning and assessment is actually a view of social practice. The socio-cultural theorist Lave (1998) sees the learner as a member of the "community of practice." As a result, the learner is both shaping and being shaped by the community of practice. According to this perspective, learning is a social and collaborative activity in which learners develop their thinking together (James, 2005, p.57).

When it comes to assessment, the assessment activities within this perspective are embedded in the learning (Peter, 2007). Assessment is a dynamic process that provides both prospective measures of performance including competencies that are developing, and is predictive of how the student might perform independently in the future (Palinscar, 1998).

Furthermore, the socio-cultural tradition of Vygotsky and the socio-cultural school hold that the origins of consciousness are socially situated. The learner is who he or she is through participating in the community around him /her (Pryor & Crossourd, 2005). Learning and identity are therefore not separate, because learning involves the construction of identity (Lave & Wenger, 1991). However, identities are multiple, performed and reconstructed continuously through engagement in the community of practice (Pryor & Crossroad, 2005). This view of learning proposes embedding assessment activities within the learning, which itself is embedded in the socio-cultural activities of the classroom. Actually, formative assessment is a central feature to the understanding of assessment within socio-cultural learning view.

In the socio-cultural perspective of learning and assessment, involvement in collaborative activities, social interaction and discourse are fundamental to the development of metacognitive processes which, in turn, are critical to student engagement in terms of practices of formative assessment (Wood, 1998). According to Wood, when students participate in collaborative activities and interaction, they will be more confident to think about their understanding, planning, organizing and assessing of their learning both collectively and individually. Gipps (1999, p.377) also described assessment in a social situation as it can be practiced by assessing students in collaborative group activities in which they contribute to a task and help others. According to Gipps (1999, p.377), the advantage of such a socially situated assessment is that it encourages learners to develop and question their definitions of competence. In addition, Gipps asserts that such a conception of assessment encourages lecturers to reconstruct their relationship by sharing the responsibility of learning and assessment and by involving the learner more as a partner in the classroom.

The idea of looking into formative assessment as socially situated leads to understanding assessment as a process that considers teacher-student and student-student dynamics (Ross, Ralhiester, & Gray, 2002). In Rogoff's (1990, p.28) words, effective

learning and development of competencies normally occur by experts (teachers, outstanding peers) and novices (learners) having the chance to converse as they work together on a common goal or product. Because of this, the teacher participates in the learning so that the relationships between the teacher and students are developed in a less hierarchical way (Peter, 2007). Therefore, assessment of information is commonly used between student and teacher and among peers to help learners in the regulation of learning (Torrance & Pryor, 1998). Hence, formative assessment that involves teacher's feedback together with peer and self-assessment can be a central social process that mediates the development of cognitive abilities, construction of knowledge and students' identities (Sheppard, 2000, p.4).

On the other hand, Vygotsky's proposition of the zone of proximal development (ZPD) gives a clear insight with regard to locating and conceptualizing assessment in the socio-cultural view of learning and assessment (Gipps, 1999, p.375). The notion of ZPD focuses on the existing gap between what the learner can achieve without the help and what he/she can achieve with proper help from a tutor or experienced peer. The ZPD's approach emphasizes the teacher's role regarding setting learning goals that are achievable by the learner with appropriate help and provision of such help through formative feedback practices (Black, 1999). This may facilitate the implementation of effective formative feedback that leads students into the ZPD and encourages them to engage actively with the feedback rather than supplying students with predetermined solution paths (Peter, 2007).

In summary, the socio-cultural view of learning and assessment has clear implications for understanding opportunities of improvement in student learning. The view promotes the increased use of alternative assessment practices that take account of the social and cultural context in which learning occurs (Peter, 2007). Researchers in educational assessment (for example, Bourke, 2000; Ruthven, 2002) list several alternatives of formative assessment such as formative feedback, self-assessment, peer assessment, observations, portfolios, practical assessment, investigations and small group projects as valid techniques of gathering information about student learning achievement and improvement. In fact, practical implementation challenges of these alternative types of assessment are well recognized (Watson, 2006). There are different implementation challenges. For instance, the long existing view of knowledge that considers the teacher the main source of knowledge (behaviorist view) is difficult to change in the minds of practitioners. On the other hand, the learning skill of students is by large limited to receiving knowledge rather than sharing it. Moreover, large number of students and shortage of learning resources impede socio-cultural learning activities. Furthermore, instructors' attitude and shortage of the skills to implement such types of learning and assessments are worth mentioning.

3. Conclusions

Instructions and assessment procedures designed based on the theoretical perspectives could help students gain different competencies. The theoretical perspectives can inform the learning and assessment process based on the nature of what is learned and the level of learners' involvement. Complexity of the learning task and assessment demands may determine on which of the perspectives to rely. For instance, one cannot teach and assess facts the same way that concepts or problem solving are taught and assessed. Similarly, the proficiency level of the learners involved will influence the theoretical perspective to rely on. As learners acquire more experience with a given content, they progress along a low-to-high knowledge continuum from recognizing facts and rules (knowing what), to thinking and extrapolating facts and rules to problematic cases (knowing how), to developing and testing new forms of understanding and acquisitions when familiar ways of thinking fail (reflection-in-action).

Depending on where the learner is in terms of level of knowledge (knowing what versus knowing how versus reflection-in- action), the most appropriate instructional approach can be derived from the respective theoretical perspectives. That is, a behavioral approach can effectively facilitate mastery of content (knowing what), cognitive approach can be used to teach problem solving skills where defined facts and rules are applied in unfamiliar situation (knowing how), and social constructivist approaches suit to deal with ill-defined learning problems through collaboration and reflection-in-action.

On the other hand the cognitive processing requirement of the task to be learned may determine the theoretical perspective that informs the instructional approach to be followed. For instance, for a learning task that requires a low degree of cognitive processing (e.g. definitions, facts, discriminations, paired associations, rote memorization, stimulus-response, and contiguity of feedback/reinforcement) it seems to be approached by the behavioral perspective. Learning tasks, which require an increased level of processing (e.g. advanced concepts, classification, rule or procedural executions, and conceptual change and development) are associated with strong cognitive emphasis (e.g. schematic organization, reasoning, problem solving). Learning tasks requiring high levels of processing are best approached by constructivist perspective (e.g. situated learning, cognitive apprenticeship, social negotiation).

Thus, as a professional practice, education has to rely on the theoretical perspectives which inform learning and assessment. Each of the perspectives discussed have contributions to guide student learning and assessment. For instance, the behaviorist model fits to the teaching at lower grades and new concepts at higher levels. Cognitive-constructivist and socio-cultural models fit to teaching at higher levels of education, advanced courses, and in programs of adult education and training. Therefore, teachers of all levels should increase their awareness practice with respect to planning and implementing learning environments based on the respective theoretical views of learning and assessment. For example, when a new course is started, the learning experiences devised could be informed by the behaviorist perspective of learning and assessment until the learners come to master the fundamental concepts in the course. However, after the mastery of fundamental concepts, the learning experiences devised need to be seen from the perspectives of cognitive-constructivist and socio-cultural perspectives of learning and assessment.

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