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THE SIGNIFICANCE OF CONSTRUCTIVIST CLASSROOM PRACTICE IN NATIONAL CURRICULAR DESIGN

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ABSTRACT

Evidence of the value of constructivist theory in the classroom is especially important for educational practice in areas of poverty and social challenge. Research was undertaken in 2010 into the application of constructivist theory on instructional design. The findings of this research are particularly relevant to the current curricular crisis in South Africa which threatens to side-line constructivist priorities and return learners to rote learning from textbooks. The findings are situated here within the national debate over curricular design and instructional models. Placing instructional design within the larger context of national pedagogical contestation provides important evidence of the central role of Freirean imperatives for South Africa’s educational future. This article indicates that a constructivist framework, when pertinently arranged, provides holistic and sustainable procedures for knowledge creation. The findings from the research project showed that, in an environment conducive to learning, learners become
self-motivated and better able to master the next phase of the curriculum. As a result of the constructivist framing, participants grew into strategic and effective learners who took responsibility for their own learning. These findings add weight to the call for reconsideration of constructivist foundations in national curriculum design.

**Keywords:** assessment, learning, teaching, constructivism, independent thinking

**INTRODUCTION**

Freire regards learner experience as central to the construction of knowledge (1991, 57). Learners’ experiences have to be uncovered as they have the power to block learning, according to Wallerstein (1987, 35). These theorists define central aspects of the epistemology of constructivist pedagogy as a mutual procedure between teacher and learner. By contrast, the apartheid era in South Africa emphasised rote learning within an authoritarian educational structure. Giroux (1991, 171), in outlining the critical approach, distinguishes between knowledge about, that is to say the digital dimension of learning (univocality, precision, logic) experienced in school as opposed to knowledge of, that is the analogic dimension (equivocation, ambiguity, description) experienced by learners on the street. If knowledge is merely given or presented to the learner, it is of a linear or relatively unproblematic nature, and therefore does not engage learners’ experiences. This is characteristic of transmission education. The paternalism of banking education is frequently used to maintain an oppressive political and social order; patriarchal hegemony ensures that learners complete the grades set but remain passive and unquestioning. Universities have been guilty of conspiring with dominant political dispensations by engaging in the processes of transmission education and deepening the literacy crisis in public schools. Liberal educational reformers under the ANC government in 1994 and later, entrenched Freirean principles, which acknowledge learner experience in the construction of knowledge. Since that initiative, however, the trajectory of an enlightened programme of education has been compromised and threatened by the return to textbook learning or ‘banking education’ in Freire’s terms. Framing teaching, learning and assessment within a constructivist mode can make the difference between authentic appropriation of information and learning facts by heart.

This article draws on empirical research completed between 2008 and 2010 (Booyse 2010) to assess the efficacy of a constructivist framework used in instructional design and assessment practice. The empirical research included focus group discussions, open questions for a whole-group discussion and a three-month project in classroom assessment. The population for the research was 287 practising teachers holding a 3-year diploma in Education with a Relative Education
Qualification Value (REQV) of 13. Teachers were enrolled on a part-time basis at a higher education institution to upgrade their qualification to a REQV 14 level (Loots 2008). The educational background of the participants represents a multi-layered and multi-dimensional culture in terms of home-language, teaching-learning environment and social strata (McMillan and Schumacher 2006, 315–20). Participants shared the interactive experience of using a constructivist framework in their planning, teaching and assessment practice. This article aims to investigate the impact of a constructivist approach on instructional design and assessment practice. This qualitative study was situated mainly within the epistemological framework of social constructivist thinking, which concerns itself with the process of how people construct meaning (Pilling-Cormick and Garrison 2007, 18; Rossingh and Chambers 2011, 62) and understanding.

SOCIAL CONDITIONS IN SOUTH AFRICA RELEVANT TO CONSTRUCTIVIST FRAMING

South Africa is characterised by two parallel economies— the first and the second. The first economy consists of the elite— largely urbanised, increasingly multiracial and made up in particular of corporate employees, government senior structure and entrepreneurs. Learners whose parents form this group of privileged professionals attend mainly private, semi-private or ex-Model C schools. The marginalised comprise the Second Economy that is characterised by underdevelopment, contains a large percentage of the black population, incorporates the poorest of the rural poor, is structurally disconnected from both the First and the global economy, and is incapable of self-generated growth and development (Mbeki 2003, 14). The metaphor of two worlds is extended into South Africa’s dual education systems. The second school system enrolls the vast majority of poor and working-class children whose health, economic and community difficulties concomitant with equally deficient schools produce learners who read mostly at the functional level, write without fluency or confidence and use inappropriate concrete techniques when performing numeric operations (Fleisch 2008, 2).

Poor children on the margins of South African society suffer a myriad health problems, and the link between poor health and learning failure is strong. The key health problem is malnutrition which is likely to result in irreversible damage to children’s intellectual development (Zere and McIntyre 2003). Other health problems include the high rate of stunting (weight : height ratio), micronutrient deficiencies, hunger, parasite infections, hearing loss, asthma, foetal alcohol syndrome, HIV/AIDS, lead poisoning, mental-health problems, domestic violence and vision. These clinical aspects impact directly on school achievement. Poor children learn a restricted set of practices that do not adequately prepare them for success with ‘school codes’. Peers
in advantaged settings enjoy quality pre-primary education and access to a book culture in the home. Barbarin and Richter (2001, 173) summarise poverty eloquently:

Poverty means insufficient money for school fees and books, and having to stay out of school for several weeks until funds can be found to purchase shoes and school uniforms...Poverty means children being left at home by parents who must leave for work before they wake up, with the children getting themselves up on their own and out to school without breakfast.

The People’s Education movement of the 1980s provided a recognisably alternative and radically transformative departure point for literacy development in South Africa. Fundamentally, People’s Education addressed the loss of agency in its emancipatory rhetoric and espousal of Freire’s principles of pedagogy of the oppressed (Nekhwevha 2002). During the liberation struggle, literacy reformists embraced the ideals of Freirean critical pedagogy that seemed to speak directly to the need for the transformation of education in South Africa. Traces of Freirean critical rhetoric became embedded in the rationales for the three curriculum reconstruction initiatives post-1994. The 2011 Curriculum Assessment Policy Statement continues to espouse the principles of social transformation, ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sectors of the population and encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths (Department of Basic Education 2011, 4). Yet, since 1997, there has been a steady shift away from Freirean principles in implementation and practice, more marked with each iteration of the post-1994 school curriculum.

Teachers are charged with preparing learners for living and working in an increasingly interdependent world (Erickson 2007, 1). Pink, in his book *A Whole new mind: Moving from the Information Age to the Conceptual Age* (2005, 1–69) highlights the importance of creative thinking and the ability to construct one’s own meaning. Christie (2008, 41) explains in her book *Opening the Doors of Learning*, that the challenges of globalisation in contemporary society are so different that they call for new understanding and more innovative theoretical approaches. Teachers enrolled in an Advanced Certificate in Education from 2005–2009 mentioned on several occasions that they found it difficult to frame teaching theoretically and develop critical, creative and conceptual skills, while still teaching the required content. They mentioned that some of their biggest challenges are developing the individual learner’s ability to construct personalised meaning and solve increasingly complex problems in the learning area and daily life. This revives the question of how to plan, structure and assess in order to accommodate required abilities. Habermas (1984, 220) contends that genuine conceptual learning occurs only when learners make their own sense of knowledge:
The curricula of schools are other people’s knowledge, imposed on the learner. Not surprisingly, some learners do not bother to make personal sense of this knowledge but merely play the school game of rote learning and reproducing the curriculum knowledge.

THEORETICAL STANDPOINTS RELEVANT TO CONSTRUCTIVIST FRAMING IN SOUTH AFRICA

Behaviourism treats the learner as an agent who builds competency through various stages of behavioural change. Cognitivism recognises the importance of the mind in making sense of the material presented. Constructivism, as an approach to cognitive development, recognises that the learner possesses prior knowledge and experiences which have to be acknowledged as the foundation for the construction of new knowledge. To identify links between cognitive and constructionist imperatives, the ideas of Bruner (1962) were investigated. Bruner maintains that learners construct new ideas or concepts based on their current or past knowledge. The connection to both cognitive and constructivist thinking is recognised. Bruner thinks about cognitive structures as ‘a model we construct to give meaning and structure to regularities in experience’ (Bruner 1962, 120). Adapting to the changing environment through learning allows the learner to select and transform information, construct hypotheses and make decisions which show significant links with learning as a social construct. Vygotsky (1987), a social constructivist, emphasises the value of social structure and cultural and social knowledge in the teacher-learner situation – learners draw on their experiences to construct understanding in a way that makes sense to them. Learning should take place through social interaction, particularly with knowledgeable others, so that learning, language and understanding are interdependent. Mediated learning – what Bruner (1962) describes as ‘active dialogue’ and the Vygotskian notion of the learner as an active maker of meaning – were found to be key elements in using a constructivist approach to instructional design and assessment practices. When learning is recognised as a social construct, cognition validates individual experience and allows the individual to go beyond the information given. In the application of a particular approach, cognitive and metacognitive elements provide a wide spectrum of combinations.

Within instructional design, there is a place for each combination of elements according to the specific learning area or teacher-learner environment. Cognitivism, however, may be regarded as the dominant aspect of instructional design. Many of the instructional strategies advocated and utilised by behaviourists are used by cognitivists, but for different reasons. Behaviourists assess learners to determine a starting-point for instruction, while cognitivists consider a learner to determine his or her own predispositions. When designing from a behaviourist/cognitivist stance, the teacher has to analyse the situation and set a goal or objective. Individual tasks are interpreted in terms of developed learning objectives which determine what should
be achieved. In this approach, the teacher as instructional designer decides what is important for the learner to know and attempts to transfer that knowledge to the learner.

Assessment/evaluation, in the behaviourist approach, is characterised as a process during which it should be determined whether the criteria for the objectives have been met. Following this approach, it is crucial to understand that a learning package is something of a closed system; although it may allow for some branching and remediation, the learner is confined to what was designed and planned as a teaching strategy. A behaviourist approach can effectively facilitate mastery of the content (knowing what), where tasks for instance require a low degree of processing. Cognitive strategies prove to be useful in teaching problem-solving tactics where defined facts and rules are applied in unfamiliar situations (knowing how). The tasks which require an increased level of processing (classifications, rule or procedural executions) are primarily associated with strategies which have a stronger cognitive emphasis (schematic organisation, analogical reasoning, algorithmic problem solving).

Design from within a constructivist approach requires the teacher to produce something that is much more facilitative in nature, rather than prescriptive. As seen from the ideas embedded in social constructivism, the direction in the teaching process is determined more by the need and level of understanding of the learner. Assessment should be formative in character– it does not depend on specific quantitative criteria, but on the process which includes self-assessment by the learner. Constructivist strategies are particularly peculiarly well-suited to dealing with ill-defined problems through reflection-in-action. Ertmer and Newby (1993, 50–70) declare that heuristic problem-solving, personal selection, and monitoring of cognitive strategies are frequently used in situated learning, cognitive apprenticeships and social negotiation as examples of tasks related to constructivist strategies which demand high levels of processing.

Though instructional design may have a behaviourist tradition, a constructivist approach provides new insights into the learning process in order for the teacher to adapt and alter the teaching-learning process (see Table 1). From the focus group discussions and the project, it is clear that the application of a constructivist approach to learning and the strategies associated with it enables a learner to construct his or her own meaning and understanding, but requires grounded knowledge. The participants stressed the importance of acknowledging the learner as a complex and diverse individual–incorporating mediation in the negotiation of meaning, which produces a much more facilitative and negotiated teaching-learning environment. The key challenge for the teacher is to integrate teaching-learning-assessment as interrelated aspects of a single process.
Table 1: Summary from literature study of behaviourist, cognitivist and constructivist views of learning

<table>
<thead>
<tr>
<th>Approach</th>
<th>Behaviourist</th>
<th>Cognitivist</th>
<th>Constructivist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Views of learning theorists included in investigation</td>
<td>Pavlov, Skinner</td>
<td>Chomsky, Piaget, Ausubel, Bruner, Gagné</td>
<td>Dreyfuss, Heidegger, Bruner (active process), Piaget, Vygotsky, Feuerstein</td>
</tr>
<tr>
<td>View of the learning process</td>
<td>Change in behaviour</td>
<td>Internal mental process (including insight, information processing, memory, perception)</td>
<td>Mediated process in social context, interaction between educator and learner, negotiation of meaning</td>
</tr>
<tr>
<td>Focus of learning</td>
<td>Stimuli in external environment</td>
<td>Internal cognitive structuring</td>
<td>Learning and knowledge are interactive and dynamic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cognitive, affective and needs are acknowledged</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Learning takes place in social context</td>
</tr>
<tr>
<td>Purpose in education</td>
<td>Produce behavioural change in desired direction</td>
<td>Cognitive capacity to be improved, modification of existing schema</td>
<td>Learner to attach own meaning to concepts to enable knowledge application (transfer) to new contexts</td>
</tr>
<tr>
<td>Educator's role</td>
<td>Arranges environment to elicit desired response</td>
<td>Structures content of learning activity</td>
<td>Mediator to negotiate meaning and support development of the whole person</td>
</tr>
<tr>
<td>Manifestations in learning</td>
<td>Behavioural objectives Competency-based education Skill development and training</td>
<td>Cognitive development Intelligence, learning and memory as function of age Learning how to learn</td>
<td>Establish understanding and own meaning based on prior knowledge (schema) Application of different cognitive skills at different levels of demand</td>
</tr>
</tbody>
</table>
Following a constructivist approach, participants found that, because assessment is based on established criteria, teaching, learning and assessment are seen as a process in which the teacher makes use of formative (constructive) feedback to direct learning and even self-assessment by the learner. Although the research process did not investigate teaching-learning environments per se, a conducive teaching and learning environment might be established if the following constructive planning efforts are included in the instructional and assessment design:

- A mediating process to negotiate and articulate mental models; using those models to explain, predict, infer from, and reflect on their utility
- Social negotiation as a process of sharing a reality with others using the same or similar processes to those used in internal negotiation
- Consideration of learners as individuals
- Authentic contexts for learning supported by case-based (simulated) problems which have been derived from and situated in the real world
- A variety of problem-solving methods: problems in one context are different from problems in other contexts
- Collaboration among learners (peer learning) and with the teacher as mentor and mediator

A constructivist approach anchors knowledge acquisition– the teacher predetermines learning outcomes, maintains sequenced instructional interaction in the mediation of learning, and applies criterion-referenced assessment which may provide formative feedback.

THE PURPOSES AND APPLICATION OF CONSTRUCTIVIST ASSESSMENT IN INSTRUCTIONAL DESIGN

In the empirical study upon which this article is based, classroom assessment was usually based on testing in which learners were expected to produce the correct answers (Borich and Tombari 2004, 1, 43, 44). In constructivist assessment, however, the process of building and assessing knowledge is viewed as more than a product– it is the process of creating and illustrating own understanding. Mediation and acknowledgment of the learner as an individual are essential. Constructivist views of assessment emphasise the concept of continuous, dynamic assessment– the interactive nature of teaching and learning is extended to the process of assessment. Assessment is seen as a mutual process involving teacher and learner in a dialogue to establish current levels of performance and to negotiate ways in which the level of performance can be improved. Learners’ achievement can be assessed, the quality of the learning process monitored, and the planning of teaching reviewed.
In a constructivist framework, the role of the teacher in the teaching-learning assessment process is to monitor knowledge construction. This role involves the assessment of prior information, the acquisition of new information and transformation and the elaboration and organisation of newly-acquired information. Assessment becomes an organic part of teaching and learning. Connections between assessment and learning encourage a holistic approach to assessment and its impact on the teaching-learning process. Instructional design, based on constructivist strategies (see Figure 1) involves a process of knowledge construction in an open-ended learning experience. In this process, the learner becomes a sense-maker and the teacher a cognitive guide. In the proposed design, the teacher, as instructional designer, acknowledges learning as a social construct and plans within a particular context for a particular context. The designer allows diversity to guide choices in the instructional structure. Outcomes give direction in the planning of the teaching, deal with the content and guide the teacher to find the purpose of assessment for the particular content and level of learners. Determining outcomes has to do with understanding the cognitive pathways along which learners are expected to progress. The link between outcomes, cognitive levels of demand, and assessment criteria needs to be stressed. Classroom activities need to be part of the instructional design to support the negotiation of meaning, involve the learner in classroom activities and prepare for assessment. In the constructivist classroom, both teacher and learner think of knowledge as dynamic and ever-changing. It is within this understanding of knowledge that innovative thinking can be fostered.

Figure 1: Constructive instructional design for curriculum enactment

Metacognition (thinking about thinking) is the core of teaching, learning and assessment. The teacher’s self-awareness includes awareness of who the learner is and how the learner learns. Alignment of teaching and context, writing outcomes/objectives, choice of teaching strategies, and deciding when and how to apply
particular strategies in curriculum implementation (enactment), are metacognitive actions. These can take many forms, including knowledge about and when and how to use particular strategies for learning or for problem solving. Although the keys are indicated separately in Figure 1, all actions are linked to an indication of movement towards a particular goal. Figure 1 should be read and interpreted with Figure 2 in order to assess the impact and effect of a model based on constructivist principles on the educational environment; both the figures impact on the teaching-learning-assessment process (Booyse 2010, 171–2).

**Figure 2:** Formative assessment practice for curriculum attainment

Constructivist instructional design is viewed in this model as a process to inform, support and ground base formative assessment practice. To acknowledge context, the importance of language in the classroom guides writing assessment criteria and the structure in which formative feedback needs to appear. Assessment needs to be cumulative and expansive in nature.

The teacher decides on the indicators or broad criteria for each outcome/objective and looks for potential in a learner’s performance in order to verify the ability or knowledge expected in the outcome—there is a link between the set outcomes/objectives and the applied assessment criteria. Such scaffolded classroom activities may be used as a diagnostic assessment exercise to inform the teacher of difficulties experienced at a particular stage of the teaching. The practical assessment task provides multiple opportunities to construct understanding and involve learners in self- and peer-assessment exercises to enable them to reflect on their individual understanding of the task and work at hand.

The linear and cyclic processes indicated in Figure 1 and Figure 2 are designs for learners’ learning experiences. Instructional planning is designed for mediated learning to take place and for development of knowledge and skills (abilities). A formative assessment practice ensures that demonstration of such knowledge and skills becomes possible.
Constructivist instructional design is a process for informing, supporting and basing formative assessment practice. There should be clear guidelines for writing assessment and the structure of formative feedback in order to acknowledge context and the importance of language in the classroom and to pinpoint outcomes. Assessment needs to be cumulative and expansive in nature—teachers should ensure that each assessment is based on criteria applied to a particular situation or ability in a particular certain context. Previous judgements or criteria are not germane to new assessment contexts.

The development of knowledge, skills and formative assessment practice ensures that demonstration of knowledge and skills becomes possible. The processes, planning and application of the instructional design (Figure 1) run concurrently with the thinking process and assessment practice (Figure 2) to bring about cognitive, affective and psychomotor development in five stages:

**Stage 1:** The teacher becomes aware of the current stage of knowledge and ability which informs the teacher’s teaching plan. Awareness of the context, prior knowledge of the learners, diversity of learners in the teaching-learning situation, outcomes, and purpose of assessment direct the choice of teaching strategies and the approach to content and concepts.

**Stage 2:** The design includes questions to determine the level of knowledge and to direct the negotiation of meaning. Effective questioning may activate cognitive mechanisms or pathways for learners to develop basic conceptual knowledge in order to comprehend what the content and concepts entail and to be able to apply and demonstrate abilities to analyse and evaluate. Thinking about assessment of abilities in action is necessary. If a teacher later needs to assess learners’ problem-solving ability or the way they are able to interact, the situation in the class prepares them for such demonstration of performance.

Classroom activities enable the teacher to support the learner to reach a more in-depth understanding. Scaffolding as a teaching strategy is most applicable at this stage because the teacher can allow peer involvement, act as external source of information, direct the learner’s attention to the particular starting-point of the task, simplify the task/activity by referring to different steps to follow, and highlight main features. Although mediation is viewed as a pivot in the teaching and learning process, the quality of mediation and construction of meanings at this stage may influence the learner’s performance during assessment. Provision of emotional support raises the motivation and confidence of the learner to take up challenging tasks.

**Stage 3:** The considered responses of the teacher and learner take the form of question and answer times and discussion sessions to further a formative assessment process. Diagnostic assessment to determine understanding, misconceptions and ‘gaps’ in understanding and ability may be an informal verbal discussion, a short test or practical class work deriving from previous classroom activities. Responses of the learner to the teaching may appear during the teacher’s explanation of expectations. Effective questioning plays a vital role at this stage. The learner may question assessment criteria and ask questions to obtain clarity about expectations in the assessment task. This kind of engagement with the assessment criteria is important as it ensures that the learner would be able to achieve the outcomes linked to the mediated assessment criteria.
Stage 4: Development of the learner’s ability to undertake self-reflection (self-assessment) and peer-assessment provides the learner the opportunity to reflect on teaching and learning. If the learner understands what is expected in the assessment criteria, knows how to apply a particular set of outcomes/objectives in answering questions, and is able to value the work, the learner’s capacity for self-assessment enhances reflection and self-management. Self-assessment is paramount—it enables the learner to judge and provide substantiated opinions.

The ability to attach value and evaluate combines the fourth and fifth affective domains. The affective domain of valuing comprises the learner’s ability to demonstrate preference for, or display a high degree of certainty regarding, a certain opinion. The domain of organising constitutes the learner’s ability to combine different values, information, and ideas and accommodate them within his or her own schema by comparing, relating and elaborating what has been learned. Valuation and organisation evidence self-reflection and self-assessment (Booyse 2010, 175). The teacher’s formative feedback may strengthen the learner’s ability to complete self-assessment and focus on a realistic goal. The teacher’s feedback raises the level of critique, develops the learner’s thinking and learning, and assists the learner to separate judgement of the self from performance.

Stage 5: Adjustment of instructional design and the learner’s modified understanding are a culmination of all the actions in stages 1–4. Stage 5 predetermines what would happen in the new stage 1 of the following cycle of teaching and learning. Cognition is a variable and thinking patterns can change—intelligence is modifiable in order to apply knowledge in new and unfamiliar situations.

**Figure 3:** Instructional design, learning and assessment as constructive processes

(Booyse 2010, 178)
All the stages refer to a level of self-awareness in learning. The stages are arranged to regulate cognition and learning experiences through a set of activities which assists learners in their learning (metacognitive experiences). Individuals with a high level of metacognitive knowledge easily identify blocks to learning early on and change their approach to achieve the goal. This ability improves performance and the teacher’s ability to plan more effectively. Both teacher and learner are better able to know what (factual or declarative knowledge), when and why (conditional or contextual knowledge), and how (procedural or methodological knowledge) to apply knowledge and skills.

CONCLUSION

Constructive assessment encourages and fosters motivation by emphasising progress and achievement rather than failure. By giving constructive feedback, educators can create a stimulating environment that encourages learners; enabling them to comprehend new concepts and content. This self-development is possible when learners are given credit for what they do, rather than being penalised for what they have not yet mastered. In order to use formative feedback effectively, the assessment associated with it should not be seen as yet more frequent testing or as an informal assessment which limits learning. Formative feedback should be seen as a process in which information regarding learning is evinced and used to modify the educator as well as the learner’s understanding of how and on what level learning took place. Formative feedback needs to be specific, immediate, and addressed to the individual learner. Educators need to pinpoint the learner’s strengths and weaknesses to determine how these might be built upon or addressed in order to improve the work. When learners become self-motivated, they are better able to master the next, more challenging, step. In this way, learners become strategic and effective agents learners who take responsibility for their own learning. The participants in the research project showed that, by linking feedback to outcomes and assessment, and by disclosing the full range of achievements to learners, the feedback became truly formative, encouraged learners to achieve their best, and strengthened the mediation process of assessment. Such patterns of invisible pedagogy may serve to recuperate the enlightened modes and goals of a Freirean classroom envisioned by educational reformers in the years immediately after 1994 and stay the threat of a return to rote learning.

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