

On the Unity of Behaviourism, Cognitivism and Constructivism in Teaching and Learning

Sitwala Namwinji Imenda

University of Zululand, Department of Mathematics, Science and Technology Education,
KwaZulu-Natal, South Africa 3886
Telephone: +27828883606, +27359026349, E-mail: ImendaS@unizulu.ac.za

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ABSTRACT There appears to be more argument than agreement concerning whether Behaviourism, Cognitivism and Constructivism can be applied in a complementary way to classroom practice, or they are simply blatantly incompatible and mutually exclusive. This paper explores the assumptions and defining characteristics of these three educational psychologies with a view to determining whether or not they are compatible enablers for classroom practice. The review has been undertaken against an apparent lack of consensus among educationalists on an individual and collective worth of these three perspectives insofar as their applicability, relevance and appropriateness to modern-day classroom practice. The review of literature leads the author to the position that there is justification to conclusion that there is enough room and purpose in today's classroom for behaviourism, cognitivism and constructivism to co-exist and reinforce each other for the benefit of students across the diversities of instructional environments and circumstances.

INTRODUCTION

Two of the operative concepts under-girding the three education psychologies addressed in this paper are *learning* and *teaching* – as Qvortrup et al. (2016: 3) opine, “definitions are necessary in advancement of academic efforts because they are the markers needed in evaluating a theory” and that “without a precise definition of the subject in question, it will remain unclear whether a theory covers all relevant possible instances under discussion.” This is particularly important as this paper focuses on a number of terms which require conceptual clarity. It is therefore appropriate to reflect on these two terms before proceeding with the discussion of the theories that attempt to define and operationalize these constructs.

Anderson (1995: 3-4) defines learning as a “process by which relatively permanent changes occur in behavioral potential as a result of experience.” In this definition, the emphasis is on ‘relatively permanent’ as well as experience. The definition rules out learning that takes place due to the natural process of maturation. Killen (2010: 23) describes learning as “a process that involves making connections, identifying patterns, and organising previously unrelated bits of knowledge, behaviour and actions into new

patterned wholes”. To De Houwer et al. (2013: 1) learning refers to “changes in the behavior of an organism that result from regularities in the environment of the organism.” The limitation of this definition is that learning can also occur from non-regular or routine events. Other authors define learning as “a change in understanding and behaviour that results from encountering new experience” (Spady 2001: 18). From these definitions, one may view learning as an encompassing acquisition of new knowledge, skills, values and/ or attitudes as a result of instruction, study, experience or intuition – leading to modified understanding and/or action. However, within the context of this paper, the main threads of definition revolve around notions of learning as behavioural change (behaviourism), learning as conceptual change (cognitivism and constructivism) and learning as both behavioural and conceptual change (eclectic view). These definitions of learning, themselves, are dependent on the definer’s ontological orientation with regard to the three theoretical perspectives of behaviourism, cognitivism and constructivism. It could be argued that as we learn we alter the way we perceive our environment, the way we apply ourselves to it, the way we interpret events and processes taking place in it, the way we process incoming stimuli – and

therefore, the way we interact with others or behave. In the same way, teaching involves a process of planning and subjecting students to experiences that could lead to their attainment of new knowledge, understanding, competences, skills, values and/ or attitudes – including even their ways of interpreting their environments, looking for meanings and understanding. Inevitably, within the requirements of the school system teaching also involves learner assessment, that is, measuring and evaluating student achievements from the planned learning experiences. To be successful at ensuring that learning takes place optimally, teachers usually plan and implement their lessons under the influence of one educational psychological perspective or another.

There are also notions of social versus asocial learning, where social learning refers to learning that is influenced by observation of, or interaction with, another animal (external view) and is regarded as a change in an animal that is caused by a specific experience at a certain time, and that is detectable later in the animal's behaviour (internal view) (Cooper 1993; Heyes 1994).

Aim

This is a theoretical paper examining whether or not the three dominant educational psychologies of behaviourism, cognitivism and constructivism are adequate in directing modern-day teaching and learning processes. This is done against an apparent spectre of a lack of agreement regarding the individual and collective relevance, appropriateness and currency of these three educational psychologies as a basis for authentic learning and teaching experiences.

METHODOLOGY

This was a critical literature study based on the analysis of different authors' views on the three dominant educational psychologies of behaviourism, cognitivism and constructivism. Typically, a critical literature study provides an up-to-date critical review of what is currently known about the subject of interest, and offers some insights into the subject (Zhao et al. 2003; Galvan and Galvan 2017). According to Grant and Booth (2009: 93), a critical literature study "goes beyond mere description of identified arti-

cles and includes a degree of analysis and conceptual innovation." Thus, in this study, the author attempted not only to describe the main aspects of each of the educational psychologies under review, but to also offer fresh insights on their applicability to both research and classroom practice. Content analysis was used to analyse the data (Oplatka 2017).

The Road from Behaviourism to Constructivism

According to Cooper (1993: 16), the transition from behaviourism to constructivism, via cognitivism progressed as follows:

The move from behaviourism through cognitivism to constructivism represents shifts in emphasis away from an external view to an internal view. To the behaviourist, external processing is of no interest; to the cognitivist, the internal processing is only of importance to the extent to which it explains how external reality is understood. In contrast, the constructivist views the mind as a builder of symbols – the tools used to represent the knower's reality. External phenomena are meaningless except as the mind perceives them. Constructivists view reality as personally constructed, and state that personal experiences determine reality, and not the other way round.

To Cooper (1993: 18), the first shift (that is, behaviourism to cognitivism) changed the way in which designed learning took place, while the second shift (from cognitivism to constructivism) had a more dramatic effect, in that it represented "not just a change in approach but a significant expansion of the dimensions of the learning setting, where the limits are expressed in terms of the desires and goals of the learner and not the designs of the instructor." Thus, the issue of teacher-centredness versus learner-centredness has been cited as an essential aspect of this shift – as Yilmaz (2011: 211) explains, "whereas behaviorist theoretical framework characterizes the underpinnings of teacher-centered instruction, cognitive and constructivist perspectives come into play in shaping learner-centered instruction."

Lamos (1984: 169) contends that there was a gradual shift from behaviourism to cognitivism, and that this occurred alongside "a corresponding shift in the research and implementation of instructional technology supporting individu-

alized instruction.” In agreement, Jonassen (1991: 6) also avers that there was continuity in the journey from behaviourism to cognitivism; that “the cognitive revolution first enlisted the neo-behaviourists, who posited a role for the mind but relegated it to ‘black-box’ status because they could not comprehend or understand it.” In similar vein, Cooper (1993: 14) supports the notion of a gradual shift from behaviourism to cognitivism, and attributes this to the complexity with what came to be expected of the learner. In Cooper’s words, “complexity in the learners’ actions has to be matched by a similar level of complexity in the instructor’s actions.” However, according to Jonassen (1991: 6) this revolution subsequently “concluded by not only acknowledging the mind, but also by studying its functions and processes.” Accordingly, Jonassen (1991: 6) surmises that “the exclusion of the mind from the learning process by behavioural laws was a primary theoretical cause of the paradigm shift in learning psychology” from behaviourism to cognitivism.

With regard to the evolution of cognitivism, Dede (2008: 43, 48) posits that this perspective developed out of “various psychological theories that underlie differing models within the general framework of cognitivist instruction”. Yilmaz (2011: 205) agrees and singles out Jean Piag  t and Lev Vygotsky as having had the most profound influence on the cognitive movement. In Yilmaz’s words, “out of the spectrum of cognitive theories, the individual cognitive trend deriving from Piag  t’s studies and the sociocultural trend based on Vygotsky’s works constitute the backbone of cognitivism.”

Von Glasersfeld (Tobias and Duffy 2009: 3) attributes the first constructivist theory to an Italian philosopher, Giambattista Vico, going back to the 18th century. For their part, Berns and Erickson (2001: 2) contend that constructivism developed between 1910 and 1920, rooted in the theories of John Dewey. Duit et al. (2008: 2) opine that “constructivist ideas developed by merging various cognitive approaches with a focus on viewing knowledge as being constructed” and that these approaches were influenced by the “Piag  tian interplay of the concepts of assimilation and accommodation, as well as by Kuhnian ideas of theory change in the history of science and radical constructivism.” In similar vein, Tobias and Duffy (2009: 3) also trace the resurgence in interest in constructivist think-

ing “to the works of Vygotsky (1978), Dewey (1916), Piag  t (1952) and Bruner (1966).” Dede (2008: 51) also agrees with the view that constructivism came about as a result of a merger of “the various social science theories that underlie differing models within the general framework of Constructivist instruction” and that these theories “were developed by diverse groups over the past century.”

With regard to the assumptions made by constructivists, Jonassen (1991: 11) explains that “constructivism claims that reality is more in the mind of the knower, that the knower constructs a reality, or at least interprets it, based upon his or her perceptions.” In particular, radical constructivists believe that there is no real world, no objective reality that is independent of human mental activity; that everyone’s personal world is created by his/her mind, therefore no one world is any more real than any other; therefore, that there is no single reality or any objective entity that can be described in any objective way; rather, that the real world is a product of the mind that constructs that world (Jonassen 1991: 11). In concurrence, Dede (2008: 50) reports as follows:

Constructivist theories of learning assume that meaning is imposed by the individual rather than those existing in the world independently. People construct new knowledge and understandings based on what they already know and believe, which is shaped by their developmental level, their prior experiences, and their sociocultural background and context.

Thus, in contrasting constructivism with cognitivism, Tobias and Duffy (2009: 3) aver that in constructivism (a) learning is problem-solving, based on personal discovery – and the learner is intrinsically motivated; (b) the learner needs a responsive environment in which consideration has been given to the learner’s individual style as an active, self-regulating, reflective learner; (c) instructional goals and objectives are negotiated rather than set, with no one best way of sequencing instructions; (d) the goal of instructional systems theory is more with developing mental construction toolkits embedded in relevant learning environments that facilitate knowledge construction by learners, rather than specific instructional strategies.

However, Jonassen (1991: 9) places both behaviourism and cognitivism under an educa-

tional category he calls Objectivism, on the basis that both have their roots in *realism* (a belief in the existence of the real world, external to humans and independent of human experience), and *essentialism* (the existence of some essential properties that make something what it is). Von Glasersfeld (1977: 34 cited in Cooper 1993: 16) earlier advanced this view by stating that objectivism “is based on two illogical premises: that what we learn is a replica of some independent, well-structured world and that this independent, ontological reality determines our experiences.”

Thus, in comparing Objectivism and Constructivism, Jonassen (cited in Cooper 1993:16) opines as follows:

The objectivist sees reality as external to the knower with the mind acting as a processor of input from reality. Meaning is derived from the structure of reality, with the mind processing symbolic representations of reality. The constructivist, on the other hand sees reality as determined by the experiences of the knower.

The importance of social interactions in-so far as constructivist learning is concerned is aptly captured by Swanwick (2005: 864) as follows:

Increasing participation in social practice results not just in knowledge acquisition but also in knowledge production and this too is an essential part of developing a professional identity. All learners should have the opportunity to mould social practice and develop new ideas. Transforming social practice, then, not only legitimises the learner’s participation, but also shapes the very community of practice into which the learner is being absorbed.

However, it is important to state that constructivism is not only ‘social constructivism’, which is attributed to the works of Dewey, Vygotsky, Hutchinson and Fluery; the other mainstream form of constructivism is ‘individual cognitive constructivism’, which is attributed to the works of Piag  t and Von Glasersfeld (Wikibooks 2010). The ‘individual cognitive constructivists’ construe learning as arising from an individual’s interaction with his/her ‘environment’ – which may or may not involve social interaction.

OBSERVATIONS AND DISCUSSION

Objectivism versus Constructivism

Jonassen (1999: 215) takes the view that “while objectivism and constructivism are usu-

ally conveyed as incompatible and mutually exclusive,” he prefers to “think of them as complementary (some of the best environments use combinations of methods) design tools to be applied in different contexts.” In fact, Jonassen contends that to reject or replace objectivism by constructivism, for instance, would be “decidedly non-constructivistic.”

In looking at the metaphysical assumptions of Objectivism (behaviourism and cognitivism seen as cuts from the same cloth) versus Constructivism, Jonassen (1991: 9) points out that the important metaphysical position that objectivism makes is that “the world is real, that it is structured, and that its structure can be modeled for the learner.” On their part, constructivists assume that knowledge is individually and “socially co-constructed by learners based on their interpretations of experiences in the world” (Jonassen 1999: 215).

Kola (2017: 59) itemises four attributes of constructivism, namely that constructivism (a) emphasizes the importance of the knowledge, beliefs, and skills that an individual brings to the experience of learning, (b) believes that learners play an active role in constructing meaning by themselves, (c) posits that people construct their understanding and knowledge of the world through experiencing things and reflecting on those experiences, and (d) as a learning theory believes that learning is an active process; knowledge is constructed from experience and a personal interpretation of the world. It appears, therefore, that the real question that needs to be explored is whether or not there is conceptual tension between these positions and, if so, how deep the conceptual rift is. If we suppose that there is a real, external reality defined by some experts in a given field of knowledge, does this stop a learner from constructing his own understanding of this reality on the basis of his/her own experiences and interpretations? Is this not, in fact, what happens all the time – and that’s why people discuss and argue about things, until they reach consensus or agree to disagree?

In the classroom, when learners are asked to work in groups and discuss a matter, one of the requirements for using the ‘discussion’ instructional approach is that there should be a controversial topic on which different people would normally have different opinions. Typically, these diverse opinions arise out of people having different personal experiences which result

in different interpretations of the same events. This means that different people operate from different internal realities, and these are personal even when they are socially constructed – that is, arising out of interactions with other people. Thus, one could argue that even when people have agreed about something, their individual mental representations of what they have agreed about are not identical. So, perhaps the metaphysical distinction between objectivism and constructivism exists more in the mind of the researcher than in ‘reality’.

Taking it from Jonassen’s observation that “constructivism does not preclude the existence of an external reality, it merely claims that each of us construct our own reality through interpreting perceptual experiences of the external world”, then it means that there is, in effect, more agreement than argument on this matter (Jonassen 1991: 7). This observation allows us to start building bridges between objectivism and constructivism. Certainly, it would not be logical to argue that there is no reality (objective or otherwise), which is external to the individual, just as it would not be logical to argue that individuals do not have their own personal internal realities. Therefore, the task before us is one of aligning these realities with each other, wherever possible, such that we eliminate or reduce whatever cognitive disparities and dissonance may exist between them. It follows then, that this is where understanding the internal individual mental processes (cognitivism) that pertain to a given task, could assist the constructivist teacher bridge the conceptual gap. One way to do so would be to give direct instructions (behaviourism), where the learner’s internal processes suggest a lack of the necessary knowledge – and it appears unlikely that the learner would benefit from social interaction with peers, experts and others. In such a circumstance, the learner in question may fail to construct his/her own understanding of the phenomenon concerned on the basis of his/her interaction with the physical or social environment (constructivism).

Teaching based on behaviourism is what most people refer to as “the traditional approach” and is often described derogatively as “didacticist, teacher-oriented and content-centred” and that it encourages “passive learning and rote memorization” (Tan 2016: 5). On the other hand, constructivism is seen as the ‘modern’ option, “in contrast to the transmission approach that

is perceived to be ‘traditional’ and antiquated” (Tan 2016: 5).

Ally (2008: 8-20) describes the various instructional characteristics of behaviourism, cognitivism and constructivism, and shows that at a practical level the classroom teacher can find application for all these three perspectives in addressing different learning outcomes. So, although the points of emphasis are different, the strategies of each can be used to achieve different authentic purposes in the classroom. Hence, without taking anything away from the espoused benefits of constructivism, it appears reasonable to point out that each one of the three educational psychologies discussed in this paper has got its strengths and limitations. Accordingly, it appears reasonable to suggest that the best thing to do would be to take what is best from each one of them and build the educational psychology for the 21st century on these strengths, rather than to take the view that cognitivism replaced behaviourism, which has in turn been eclipsed by constructivism. In fact, an exclusively constructivist classroom appears at this point in time to be unattainable because the school curriculum has set goals and learner outcomes in every subject which should be achieved within specified time frames. Thus, it would be unrealistic for teachers to adopt the constructivist position in every learning situation, that they must not look for one ‘right’ answer but focus “more on the diverse interpretations constructed by the learners” (Tan 2016: 3). Instead, one finds that there will be occasions when teachers will focus on nurturing their learners’ “independence and autonomy, guiding them to question, investigate, inquire, and learn through practice, and fostering their active and individualised learning” – while at the same time respecting each learner’s character, paying attention to individual differences, satisfying their different learning needs, constructing an educational environment that facilitates their active participation, stimulating their enthusiasm for learning, and developing their positive attitude towards knowledge mastery and application (Tan 2016: 4). Putting the same point differently, Jonassen (1991: 6) makes the point that objectivism (that is behaviourism and cognitivism taken together) is concerned with “the object of our knowing”, while constructivism is concerned with “how we construct knowledge”. The operative word is *concerned*. In the classroom situ-

ation, there will be times when we shall be *concerned* about “the object of our knowing” – for example, the name of the gas produced in photosynthesis, that is oxygen (behaviourism); and then there will be times when we’ll be *concerned* about the step-by-step process (for example involving photosystems II and I and the electron transport chain, in photosynthesis), leading to the production of sugar, water and oxygen (cognitivism); and also times when we shall be *concerned* with how the learner is enabled to put it all together (that is construct) his/her own understanding of the construct of photosynthesis at this molecular level. Thus, behaviourism allows the learner to acquire the knowledge of the important concepts and principles about photosynthesis; cognitivism models the process for the student on the basis of what the expert community has come to understand about the ‘how’ of photosynthesis; and constructivism allows the student to engage with both the already defined process as well as with fellow students to make his/her own meaning about the phenomenon. It will, therefore, be ill-advisable to speak about behaviourism and cognitivism in the past tense and only constructivism in the present tense. Instead, in order to emphasize the unity of these three educational psychologies, we probably need to come up with a hybrid term which respects the contributions of each, such as *Behavioural Cognitive Constructivism*, to describe the realities of today’s classroom. Indeed, these three educational psychology perspectives are interconnected, self-reinforcing and necessary for serving the different and diverse purposes of education. So, it is justified to celebrate the unity of these three educational perspectives, and acknowledge that constructivism is the centre piece of learning, insofar as we understand learning to be the preserve of the individual learner in building up his/her own mental reality of what s/he is learning. Accordingly, constructivism cuts across all aspects of learning – simply because learning is one task that cannot be outsourced; it simply just has to happen within the cognition of the particular individual learner – whether learning takes place through behaviourism, cognitivism or constructivism.

Referring to Table 1, one observes that as one moves from behaviourism to cognitivism and then constructivism, there is a concomitant shift from the use of direct instruction, associated with a great deal of guidance from the teach-

er, towards teaching approaches with as little guidance as possible; teaching approaches where the notion of direct instruction has gradually and consciously been replaced by ‘silent guidance’ – which is only provided by the ‘facilitator’ when/if required by the learner. As Kundi and Nawaz (2010: 30, 35) explain, the transition from “behaviorism through cognitive to social constructivism or more specifically, from transmitted knowledge to negotiated and then harvested knowledge” reflects “the emancipation of learners from bonded (teacher-led) learning to independent and self-reigned knowledge-acquisition.” They further amplify this point by stating that this has been a shift “from linear to hypermedia learning, from instruction to construction and discovery, from teacher-centered to learner-centered education, from absorbing material to learning how to navigate and how to learn, from school to lifelong learning (LLL), from one-size-fits-all to customized learning, from learning as torture to learning as fun and from the teacher as transmitter to the teacher as facilitator.”

Thus, each of these theoretical perspectives or theories underlies a particular pedagogical orientation at the centre of which is the argument of whether or not direct instructional approaches – such as demonstrating, telling, describing and explaining, are of value to students, in comparison to discovery, group-work, and problem-based approaches, which purport to have the sway to tactfully lure the student into “the zone of proximal development” for optimal learning to take place.

Kirschner et al. (2006: 84) trace “the origin of the support for instruction with minimal guidance in science and medical education” to the school of science curricula which were adopted in America in the post-Sputnik era.

At that time, educators shifted away from teaching a discipline as a body of knowledge toward the assumption that knowledge can best or only be learned through experience that is based only on the procedures of the discipline. This point of view appears to have led to unguided practical or project work and the rejection of instruction based on the facts, laws, principles, and theories that make up a discipline’s content.

However, to-date the view persists that in some disciplines – and at certain levels of education, direct instruction is the best way to achieve some espoused learning outcomes.

Table 1: A summary of the pedagogical characteristics of behaviourism, cognitivism and constructivism

<i>Behaviourism</i>	<i>Cognitivism</i>	<i>Constructivism</i>
1. Learners should be told the explicit outcomes of the learning so that they can set expectations and can judge for themselves whether or not they have achieved the outcome of the online lesson. 2. Learners must be tested to determine whether or not they have achieved the learning outcome. Online testing or other forms of testing and assessment should be integrated into the learning sequence to check the learner's achievement level and to provide appropriate feedback. 3. Learning materials must be sequenced appropriately to promote learning. The sequencing could take the form of simple to complex, known to unknown, and knowledge to application. 4. Learners must be provided with feedback so that they can monitor how they are doing and take corrective action if required.	1. Strategies should be used to allow learners to perceive and attend to the information so that it can be transferred to working memory. (colour, graphics, size of text, etc.). 2. Strategies should be used to allow learners to retrieve existing information from long-term memory to help make sense of the new information. 3. Information should be chunked to prevent overload during processing in working memory 4. Other strategies that promote deep processing should be used to help transfer information to long-term storage. Strategies that require learners to apply, analyse, synthesize, and evaluate promote higher-level learning, which makes the transfer to long-term memory more effective. 5. Learning materials should include activities for the different learning styles, so that learners can select appropriate activities based on their preferred style. 6. In addition to activities, adequate supports should be provided for students with different learning styles. 7. Information should be presented in different modes to accommodate individual differences in processing and to facilitate transfer to long-term memory. Where possible, textual, verbal, and visual information should be presented to encourage encoding. 8. Learners should be motivated to learn. It does not matter how effective the online materials are, if learners are not motivated, they will not learn. 9. Encourage learners to use their metacognitive skills to help in the learning process 10. Online strategies that facilitate the transfer of learning should be used to encourage application in different and real-life situations. Simulation of the real situation, using real-life cases, should be part of the lesson. Also, learners should be given the opportunity to complete assignments and projects that use real life applications and information. Transfer to real-life situations could assist the learners to develop personal meaning and contextualize the information.	1. Learning should be an active process. Keeping learners active doing meaningful activities results in high-level processing, which facilitates the creation of personalized meaning. 2. Learners should construct their own knowledge rather than accepting that given by the instructor 3. Collaborative and cooperative learning should be encouraged to facilitate constructivist learning: Working with other learners gives learners real-life experience of working in a group, and allows them to use their metacognitive skills. 4. Learners should be given control of the learning process. There should be a form of guided discovery where learners are allowed to make decision on learning goals, but with some guidance from the instructor. 5. Learners should be given time and opportunity to reflect. When learning online, students need the time to reflect and internalize the information. 6. Learning should be made meaningful for learners. The learning materials should include examples that relate to students, so that they can make sense of the information. Assignments and projects should allow learners to choose meaningful activities to help them apply and personalize the information. 7. Learning should be interactive to promote higher-level learning and social presence, and to help develop personal meaning.

Source: Author

Rymarz (2012: 186) makes this point in the following way:

Much of the supportive evidence for direct instruction rests on research in teaching math-

ematics and task-based learning. For instance, teaching the applicability of mathematical concepts is aided by worked examples – a prominent type of direct instruction. This is not an

end in itself but exposes the learner to a template of how to proceed and then how to apply these skills to other problems.

So, this may be a good case for what may be seen as a behaviourist approach because it involves initial teacher dominance in the instructional process, as well as repetition on the part of the student as s/he goes over worked examples (that is, behaviourism). However, there is nothing to stop the teacher from progressively engaging in higher order mathematical operations along Bloom's taxonomy, building on the worked 'problem-type' examples once the students have mastered the routine mathematical operations – that is, moving towards cognitivism and constructivism. As Rymarz (2012: 187) points out, even "those who defend constructivist instructional paradigms (where greater emphasis is placed on student directed learning) concede that in some areas direct instruction has a role to play." Likewise, Schwartz et al. (2009) argue that constructivist instruction is not ideal in all circumstances; rather, what is important is the interplay between direct instruction and constructivist learning paradigms, particularly in tasks which require higher cognitive skills. To Ertmer and Newby (1993 cited in Ally 2008: 7) these three schools of thought could be used as a taxonomy for learning, whereby behaviourist strategies are used to teach the 'what', cognitive strategies the 'how', and constructivist strategies the 'why' – where the 'what' refers to factual information, the 'how' to the processes and the 'why' to higher level thinking that promotes personal meaning and situated and contextual learning.

In-so-far as the shift from direct to facilitative instruction also involved a concomitant shift from verbal (or theoretical) learning to an emphasis on practical learning, Kirschner et al. (2006: 84) make similar remarks as follows:

The emphasis on the practical application of what is being learned seems very positive. However, it may be an error to assume that the pedagogic content of the learning experience is identical to the methods and processes (that is the epistemology) of the discipline being studied and a mistake to assume that instruction should exclusively focus on application. It is regrettable that current constructivist views have become ideological and often epistemologically opposed to the presentation and explanation of knowledge.

Furthermore, Kirschner et al. (2006: 83-84) contend that not much has been achieved so far with the notion that using instructional approaches that place more responsibility in the hands of learners, and give them minimal guidance, would achieve greater and better results. They make this point in the following way:

After a half-century of advocacy associated with instruction using minimal guidance, it appears that there is no body of research supporting the technique. In so far as there is any evidence from controlled studies, it almost uniformly supports direct, strong instructional guidance rather than constructivist-based minimal guidance during the instruction of novice to intermediate learners. Even for students with considerable prior knowledge, strong guidance while learning is most often found to be equally effective as unguided approaches. Not only is unguided instruction normally less effective, there is also evidence that it may have negative results when students acquire misconceptions or incomplete or disorganized knowledge (Kirschner et al. 2006: 83-84).

In similar vein, Rymarz (2012: 78) points out that although direct instruction may be seen by many "as an educationally unsophisticated approach, more in keeping with bygone and outmoded instructional methodologies ... a number of recent studies have pointed out that direct instruction in the classroom has a place in contemporary pedagogy in a number of situations." According to Rymarz, this is in consonance with "established theoretical approaches such as the Vygotskian paradigm of scaffolded learning and teachers being the mediators of student movement into the zone of proximal development (ZPD)". Further, Rymarz (2012: 79) contends that in situations where students lack strong content base they may find it difficult to engage with a new topic:

In order to deal with this, teachers should be aware that students can very quickly become disorientated and disengaged, when doing topics with which they have very little connection. In these instances direct instruction can provide a mechanism by which students can enter into the conversation by at least giving them some key vocabulary and concepts.

According to Rymarz (2012: 187), in order for students to enter Vygotsky's 'zone of proximal development', "where optimal learning takes place the teacher must give enough assistance

so that students do not become overwhelmed by the task at hand.” Rymarz (2012: 187) further explains this as follows:

Once in the zone, however, the teacher’s role changes and the focus moves to assisting learners to explore and expand their understanding. To do this they can utilize, amongst other things, the tools they have acquired as part of the scaffolding process. I would suggest that there is some synergy between the concepts of scaffolding and direct instruction inasmuch as both are best seen as a prelude to more complex and deeper learning.

The author remembers a time in the 1960s and 70s, in rural Zambia, when lower primary pupils doing grades one and two used to carry bundles of small sticks, to and from school, which were used to teach them to count, and then add and subtract. As they progressed up the grades, the learners gradually made less use of the sticks, as they acquired mental skills and capabilities to add, subtract, multiply and divide without the aid of the sticks. Looking back, this pedagogic approach signified movement from behaviourism to cognitivism and constructivism. In the process, learners were taken into the zone of proximal development and then, once there, they were allowed space to apply the acquired knowledge and skills in new situations. In looking at this, the author envisions cognitivism as the vehicle through which constructivism is achieved. Therefore, whether a teacher uses a behaviourist, cognitivist or constructivist approach, “good teachers will always try to situate new learning within students’ prior knowledge” (Rymarz 2012: 79), and therefore prior experiences. So, “ultimately, as with all decisions about pedagogy, what is ‘best’ depends on the instructional situation: the goals of the learning experience, the attributes of the students, the type of content, and the timeframe and resources available” (Dede 2008: 52). More specifically, it is quite possible that very active interplays between, especially cognitive-constructive interactions, characterise the learning process.

Tobias (2010: 52) explains this position in his observation that “whether learning is predominantly social or not, the internalization of learning is mediated by the types of cognitive processes engaged and by the intensity with which instructional input is processed ... constructivists would be well advised to engage in an active research program to investigate these pro-

cesses.” Certainly, once constructivists engage in researching the internal cognitive processes that are involved in the process of constructing knowledge they will become cognitivists – whether such learning takes place socially, individually, or otherwise. Similarly, Ally (2008: 7) observes that “when the behaviorist, cognitivist, and constructivist schools of thought are analyzed closely, many overlaps in the ideas and principles become apparent”.

CONCLUSION

To conclude, it appears that having an exclusively external or internal focus with regard to how learning takes place, will not sufficiently describe the full extent of reality. Realistically, it appears reasonable and plausible to think of reality as having both external and internal elements to it. Therefore, this means that we need to avoid placing ourselves in cull de sacs, or rigid silos, and then begin to define and characterise ourselves as “behaviourists” or “cognitivists” or “constructivists”. The realities and complexities of the classroom environment, in all its diversity, compel us to acknowledge that there are certain times when behaviouristic instructional strategies will work best; times when cognitivist strategies will work best; times when constructivist strategies will work best and times when combinations of the three (blended or eclectic learning theory perspective) will work best. Overall, the writer takes the position that an eclectic view of these ontological perspectives would, in effect, be the most progressive stand to take. Certainly, there is enough room and purpose for behaviourism, cognitivism and constructivism to thrive in the same classroom.

RECOMMENDATIONS

From the above discussion, it seems justified to point out that there is little purpose for researchers and practitioners to expend too much energy on these ontological turf wars; that rather, they concentrate more on how the three perspectives of behaviourism, cognitivism and constructivism could be applied to classroom practice to enhance teaching and learning. Thus, in particular, it is recommended that teachers familiarise themselves with each of these three educational theories, and the synergies that lie among them. Evidently, knowing the educational

value of each one of them, as well as the complementary value of one to the other, is critically important, since all the three educational psychologies have a vital role to play in both the planning and implementation of classroom lessons. Teachers with the ability to do this will secure the maximum benefit from the current theoretical thought in education for both themselves and for their learners.

LIMITATIONS

In a study of this nature, the scope and analysis and, hence, the overall contribution of the study are delimited by the literature that is available to the author. Accordingly, the possibility exists that the literature search could have left out some important articles which would have influenced the depth and extent of the literature analysis – and, hence, the overall outcome. The second limitation is that a theoretical paper has inbuilt bias in the interpretation of the work that is reviewed. Therefore, this could also have affected the outcome of the study.

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