



Cognitive Enrichment Advantage: Can it have an Impact on the Effectiveness of Pre-service Teachers in Botswana?

Waitshega Tefo Smitta Moalosiⁱ
Department of Educational Foundations
Faculty of Education
University of Botswana, Gaborone, Botswana
smitta.moalosi@ub.bw, smittawd@yahoo.com

Abstract

This position paper argues that teacher effectiveness is vital in any institution that train teachers in the world at large. During training, pre-service teachers are exposed to useful methods of teaching that prepare them to teach effectively and succeed in planning and preparing their work. They also possess knowledge of their teaching materials and a clearly defined pedagogy. However, this writes contend that some models exist that can assist teacher trainees to acquire an effective instruction. Thus, Cognitive Enrichment Advantage (CEA) is the model, which advocates for mediated learning (MLE) where learners are assisted in learning how to learn. The research findings of Moalosi and Forcheh (2015) on pre-service teachers in the five colleges of education in Botswana reported that males have a higher teacher efficacy beliefs than females as well as older teachers than younger ones. CEA can be incorporated in their curriculum to add to teaching effectiveness and higher efficacy levels. Effective teachers can increase students' accomplishments by facilitating active learning. The twelve building blocks of thinking of CEA, particularly where students have the opportunity to search the information they need in a systematic way in the learning environments can enable them to perform well as they learn.

Keywords: Effective teachers, Teacher effectiveness, Teaching effectiveness, Cognitive enrichment advantage, Mediated learning experience. Pre-service teachers.

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INTRODUCTION

Effective teachers are perceived as having the knowledge of what good teaching is. Good teaching is beyond defining concepts, lecturing and discussion of facts. In order to be effective, teachers ought to be thoughtful in relation to the demands of the society as well as being organized (Moore, 2015). There is a challenge in Botswana classroom environments the performances of learners are reported to be declining continuously.

The question can be asked whether teachers communicate their instructions well beyond lecturing and teaching, or has it become a norm where there are no new developments or strategies that can enhance instruction for learners to benefit from. Moore (2015) stated that, “effective teaching is a complex occupation requiring the development of knowledge and essential skills as well as a continuous professional growth” (p. 12). Hence Cognitive Enrichment Advantage can facilitate the mentioned above professional growth.

Pre-service teachers, as future practitioners ought to possess the quality of effective teachers so that their instruction can benefit learners. Teaching is a challenging profession; teachers are confronted with undesirable behaviours displayed by learners in the classroom settings. Also teacher education programs should equip the teacher trainees so that they can cope with such challenges. Cheng, Mok and Tsui (2001) commented “unless teachers change the ways they teach, students cannot become effective learners” (p. 6). Thus, teachers should move away from teacher centred approaches where the teacher is the driver in the learning environment and embrace student centred approaches more where learners can construct knowledge for themselves.

This paper discusses selected characteristics mentioned below on teacher effectiveness proposed by Cheng, Tsui and Medley (in Cheng et al., 2001). Pre-existing teacher characteristics (i.e., the set of knowledge, abilities and beliefs that a teacher possesses on entering into the teacher education program):

- Teacher competence (i.e., the set of knowledge, abilities, and beliefs that a teacher possesses and brings to the actual teaching environment on completion of the teaching program);
- Teacher performance: (i.e., the behaviour of a teacher that may change differently when teaching environment is changing);
- Student learning experience (i.e., the experience from interactions between teacher and students in the process of teaching and learning.);
- Student learning outcomes:(i.e., the progress that a student makes toward a defined educational goal);
- External teacher education: (i.e., education or training provided by external teacher education institutions for building up teacher competence) (p. 30).

The above mentioned structures of teaching effectiveness are important if pre-service and in-service teachers can use them effectively in their profession. It is reality that pre-service teachers enrol in the teaching programs with prior knowledge as their minds are not empty, the learning experience of their school years prior to training have made them to assimilate information. According to Piaget; a constructivist, assimilation is the process where by individuals use their existing schemes to interpret new knowledge. And they ought to use it in their work. When pre-service teachers complete the teaching program, they should bring knowledge and skills that they have to share effectively with learners.

Since 2009 or even before, Botswana has been facing challenges of low performing students from primary, junior and senior secondary schools. There are higher percentages of students falling than passing. The head of state President, Dr. Seretse Ian Khama addressed

the nation in 2011, he was concerned: “I must candidly report that the exams performance of pupils in our public schools continues to disappoint ... in moving forward there must be enhanced teacher motivation” (Republic of Botswana Gazette, 2011, p. 2; Makgapha, 2011). The President talked about the Botswana General Certificate of Secondary Education (BGCSE) examinations’ results, which have declined in five years. Thus, students should be assisted to develop critical thinking as they develop cognitively.

Currently, the 2015 Junior Certificate examination results show a decrease of performance when compared to 2014 (The Monitor, 2016). Therefore, when pre-service teachers are equipped with relevant skills they become more effective in their teaching profession. Cognitive Enrichment Advantage approach could be added as an additional model to assist them to become more effective.

Cognitive Enrichment Advantage (CEA) is “a comprehensive teaching method of practices in cognitive education and have been demonstrated as effective” (Greenberg, 2005, p.2). CEA model was developed in 1984 by Dr. Kathrine Greenberg and was first used in American Schools in 1988. The model assists teachers with skills to help low performing students in learning how to learn. Cognitive Enrichment approach is founded on the theory of Reuven Feuerstein, an Israeli clinical psychologist and Lev Vygotsky a Russian and a socio-cultural psychologist. Accordingly, CEA assists students to acquire individual learning tactics based on “explicit knowledge” of twelve cognitive process that help their effective thinking, as well as eight affective- motivational strategies of learning encourages them to be independent and interdependent in the learning settings (Greenberg, 2005).

Cognitive Enrichment Advantage provides a description on the major role of teachers, families, and their function as mediators in the learning journey. And the role they play in creating a learning culture that promotes “reflective and critical thinking” (p. 2). This writer argues that, CEA can help teachers to be more effective in their profession, particularly because as mentioned above students who are underachievers can have the opportunity to improve their learning. The other purpose of CEA is “a family-school partnership that helps family members and school staff to work together more closely to meet specific community needs and ensure learners success;” (p. 14). Parental involvement is still a concern particularly in public schools of Botswana. Most parents do not attend Parents and Teachers Association meetings. And such poor participation of parents make teachers to be the ones involved in students’ learning. Hence parents should assist their children with school work, and cooperate with teachers. Mannathoko and Mangope (2013) reported that, some parents in Primary schools were ignorant of their involvement as parents in attending Parents and Teachers Association meeting. They also had a strained relationship with teachers due to poor results hence shunned their involvement at schools. Parents in English Mediums schools in Botswana are actively involved in the education of their children (Republic of Botswana, 1993).

Incorporating CEA in the curriculum will benefit the students more because its applications in classrooms are different from other cognitive education methods. CEA methods of teaching enables the students to acquire the knowledge they want in constructing their individual style of learning.

Contrary, cognitive teaching methods have been viewed as emphasizing on the student’s acquiring learning strategies proposed by professionals, in application of particular assignments in reading comprehension or mathematical problem solving. Research evidence has proved that, students who learn from such models and may experience challenges is using such approaches in other learning environments, even with same classroom activities. Ashman and Conway (in Greenberg, 2005) stated that the “strategies may not have a personal relevance for students; hence students use them only under supervision” (p. 2.).

It is vital for students to know how to learn, so that what they learn is relevant to them. And can use it in everyday life not only when the more knowledge other is present. The learning environment can be conducive if teachers could be aware of or be exposed to some approaches like Cognitive Enrichment Advantage that advocates for mediated learning. The four qualities of effective mediators can facilitate effective instruction and enhance the learner's cognitive development. For example:

- Reciprocity: establishing a positive connection of acceptance, trust and understanding.
- Intent: and focusing attention catching
- Meaning: energizing awareness and making the experience personally relevant
- Transcendence: expanding understanding beyond current learning context. (Greenberg, 2005, p. 36).

Therefore, when teachers accept learners despite of their academic and cultural backgrounds and focus on assisting them, making the learning experience meaningful, learners can transcend the routine methods in the classrooms from the known to the unknown. They can value such learning, rather than the frustrations they experience on daily basis as they learn. This writer is convinced that the four qualities of effective mediators embedded in Cognitive Enrichment Advantage helps us to understand more how learning, instruction can be useful for the cognitive development of learners and the learning environment becomes a collaborative journey for both teachers and learners.

THEORETICAL FRAMEWORK

The discussion in this paper is guided by the theories of Feuerstein, Piaget (1976), and Vygotsky (1978) and has a major impact in Cognitive Enrichment Advantage. Piaget and Vygotsky have developed theories of cognitive development, and are constructivists. Constructivism is a “view of cognitive development that emphasizes the active role of learners in building their own understanding of reality” (Slavin, 2012, p. 32). Learner centred approaches are part of the ideas of the mentioned above theorists. Vygotsky though he is constructive, defined cognitive development from the socio-cultural perspective, a theory that stresses the impact of social interactions and language in cultural setting, in relation to cognitive development. Vygotsky suggested the mentioned below ideas:

- At birth we can in some ways interact with others but can do little practically or intellectually for ourselves
- Then later we grow towards self-sufficiency and independence, and by participating social activities our capabilities become transformed.
- This process is facilitated by people that a person come into contact with, initially parents, siblings, but later classmates and friends (Mcilveen & Gross, 1997, p.56).
- Social Interaction is seen as foundation determined by different social worlds and individual cultures. According to Vygotsky, when learners interact with their worlds, for example, people, objects and institutions their thinking can be transformed. Hence such interactions of “interpersonal (social), cultural-historical, and individual factors” play a major role to human development (Schunk, 2012).
- Psychological process starts as social process which could be distributed among people such as children.

LANGUAGE ROLE IN COGNITIVE DEVELOPMENT

Language is perceived as one of the main ways in which people communicate with each other through social interactions. And social interaction is seen as a foundation of cognitive development. Therefore language is a useful tool of cognitive development.

Socio-cultural theory stresses the importance of language in relation to cognitive development. According to Vygotsky (1978), language also serves three purposes. Firstly, it gives the learner the opportunity to use the knowledge he/she already have. Secondly, it is viewed as a “cognitive tool” that humans use to interpret or understand their experiences. Thirdly, language is vital because humans regulate and reflect on their thinking (Eggen & Kauchak, 2013).

The zone of proximal development (ZPD) is another central concept of Vygotsky’s work. Assisted performance defines what a child can do with the help and support of the environment of others and the individual’s capacity. ZPD consists of two developmental levels. The first is the actual developmental level, which, which can be tested from the child’s mental operations. For an example, if it is assumed that, a child’s mental age can be assessed by test; it is an implication that “ the level of development of a child mental functions has been established as a result of certain already completed developmental cycles” (Vygotsky, 1978, p. 85).

The second level of (ZPD) is defined as what the child learns through a helper or facilitator. Thus when the child does the work alone, the actual development can be said to be in operation. However when the child works with an adult, it is the potential development of the child under the tuition of a capable educative mediator, and may be able to accomplish more than what could be done alone.

According to Vygotsky, cognitive changes will occur from the knowledge that is “transformed” among people to the knowledge within an individual. Vygotsky (1978) writes “Every function in the child’s cultural development appears twice: first on the social plane and later on the individual level; first between two people (interpsychological) and then inside the child (intrapsychological)” (p. 57).

Scaffolding is another term that Vygotsky used, it is defined as “the role played by adults, teachers and so on by which children acquire their knowledge and skills” (Mcilveen & Gross, 1997, p. 56.). During the scaffolding process the role of more knowledgeable others, which according to Vygotsky are, parents and teachers, decreases when the child has masters the tasks and are left alone to do work independently. During scaffolding, more knowledgeable others assist children to complete activities that they cannot do them alone (Eggen & Kauchak, 2013).

PIAGET’S VIEWS ON COGNITIVE DEVELOPMENT

Piaget, a cognitive development theorist, focused much on studying the child as knowledge constructor. His theory of cognitive development suggested that children’s cognitive capability develop through four different stages. Piaget also proposed other terms, *Assimilation*: “is the process in which people understand an experience in terms of their current stage of cognitive development and way of thinking” (Feldman, 2012, p. 27). Thus, an individual incorporates new experiences into the existing schemes. *Accommodation*: implies that, an individual modify their existing schemes for example, changing schemes and creating new ones in response to the experience. Feldman (2012) stated “accommodation refers to changes in existing ways of thinking in response to encounters with a new stimuli or events” (p.27).

These terms implies that children can think for themselves and their thinking should be acknowledged and be exposed to methods of teaching that will develop more their intellectual abilities. The stages of cognitive development as proposed by Piaget are discussed below:

- *Sensory—motor stage* (birth up to 2 years). It is the first stage in cognitive development. Infants and younger children discover their environments by using their “senses and motor skills”. The baby knows about the world through actions and sensory information (Slavin, 2012).
- *Pre- operational* (2-7 years) Children learn to think, and use symbols in their minds to represent objects. They also develop language and concepts fast (Slavin, 2012). Children in the pre-operational stage have not matured much cognitively and they do not fully understand the concept of conservation.
- They do not realise that, though liquids can take the shape of any container the volume is still the same. For example, if milk is poured in a tall glass, and then to a shallow container; the pre- operational thinker believes that the tall glass has more liquid.
- *Concrete operations* (7-11) from the age of 7 the child’s thinking processes change again as they develop a new set of strategies. These strategies are concrete because the child can still only apply them to immediately present objects. Piaget calls them mental operations. The concrete thinker cannot think like adults, they also depend on objects that are familiar with situations. Slavin stated that “they are very much rooted in the world as it is and have difficulty with abstract thought” (p. 36).
- *Formal operational*: Is a “stage at which learners can deal abstractly with hypothetical situations and reason logically” (Slavin, 2012, p. 37). It is a final stage of cognitive development from the age of 11 to adulthood. Children in the mentioned above stage start to think like adults. It has happens usually when they reach puberty. Eggen and Kauchak (2013) proposed that, the ability of formal operational thinking permits them to study concepts like, algebra and physics.

Each stage of cognitive development comprises of new abilities that can process information (Slavin, 2012). Accordingly, Piaget suggested that, at birth children have an inborn ability for interacting and making sense of their world. Infants also display behaviour characteristics called schemes. Schemes as defined by Slavin (2012) are “mental patterns that guide behaviour” (p. 31),

It is an implication that cognitively children can think and their thoughts processes can provide guidance to behaviours they display. And there should not be regarded as empty vessels that teachers, parents and significant others ought to fill. Piaget was aware of those mental abilities of infants and children and categorized their cognitive development in four stages. Accordingly development is the process of four stages.

FEUERSTEIN’S THEORY, MEDIATED LEARNING

In Feuerstein’s views on cognitive development are similar to of Vygotsky. They held to the belief that knowledge originates from social interaction. They also emphasised that culture have an impact in an individual’s cognitive development. Their beliefs, in regard to the construction of knowledge are centred on the responsibility of available to the learner” Greenberg (2005) p. 3). the “mediator who intercedes in the direct exposure to the stimuli to provide meaning that otherwise would not be Mediated learning experience (MLE) the theory

of Feuerstein states that “individuals construct a meaningful world through the reciprocal interactions they have with more knowledgeable others who share a system of cultural meanings and values (Feuerstein et al. in Greenberg, 2015, p. 31). MLE describes the importance of social interaction that lays in the zone of proximal development (ZPD) Thus, teachers, parents and experienced peers have an important role to play in facilitating learning.

Accordingly, mediated instruction happens when a more knowledgeable person provokes a least knowledgeable individual to “label, compare and categorize” and provide meaning to the current situation and its relation to other past and future knowledge. Learning becomes more effective when individuals associate the ideas communicated by their mediator, and then they excel hence moving their zone of proximal development further. (Greenberg, 2005). Learners need to be exposed to an advanced mediated learning experience; they can be flexible in their thinking and increase their learning needs in relation to at more advance levels. The instruction of effective teachers can be conceived as “scaffolded” instruction that support learners in benefiting from objectives. Learners may not achieve this benefit without the support of effective teachers (Ashman & Conway, 1997).

Cognitive Enrichment advantage uses Building blocks of thinking and tools for learning and are categorised in five groups. The three categories focus on cognitive needs, one on affect and the other motivation. The cognitive categories assist the student’s memory in relation to learning. Greenberg, (2005). Students ought to come to learning experience prepared, therefore the Building Blocks of approaching the learning experience is useful as it entails three aspects:

Exploration: to search systematically for information need in the learning experience.

Planning: to prepare and use an organized approach in the learning experience.

Expression: to communicate thoughts and actions carefully in the learning experience (p. 55)

BUILDING BLOCKS: MAKING MEANING OF THE LEARNING EXPERIENCE

The learning environment should be a conducive so that learners can derive meaning in what they learn and they can be able to succeed in whatever they are learning. The characteristics of making meaning from the learning settings are discussed.

Working memory: to use memory process effectively.

Making comparisons: to discover similarities and differences automatically among some parts of the learning experience.

Getting the main idea: to identify the basic thought that holds related ideas

Thought integration: to combine pieces of information into complete thoughts and hold onto them when needed.

Connecting events: to find relationships among past, present, and future learning experiences automatically (p. 55).

The mentioned above building blocks when communicated effectively in the classrooms can assist students to learn how to learn. And if Pre-service teachers are exposed to CEA can become more effective while training. They can do the same in while in the field. Their

ability to transmit the knowledge and skills they have learned to students can increase. Students do struggle when learning because most of the times they fail to get the main idea on what they are learning from teachers.

Research conducted with pre-service in the colleges of Botswana sheds light in our understanding of the quality of teachers we produce. Moalosi (2015) findings on two colleges that train teachers for secondary school in Botswana: Molepolole and Tonota Colleges of Education reported that Tonota College of education pre-service teacher had low teacher efficacy in the three subscales of teacher efficacy, student engagement, classroom management and instructional strategies. Similar results were reported by Moalosi and Forcheh (2015) that such trainees need the discussed of building blocks of thinking. They need to explore, plan and express their thoughts during learning and then, they can be able to assist learners when they complete the teacher education program. Constructivism approach should be emphasized more in schools of Botswana. Moore (2015) commented, “Learners construct a unique mental image by combining information in their heads with the information they receive their sense organs” (p. 9).

CONCLUSION

To conclude, cognitive enrichment approach can assist pre-service teachers during training to add to their teacher effectiveness. The writer does not imply that what pre-service learn from training is not useful, it is as it prepares them to their professional functions. And there are some schools in Botswana that perform well and it shows that teachers engage students in learning. It is an example of teacher competence, the knowledge and beliefs, which is another component of teacher effectiveness.

Pre-service teachers however ought to bring wealth of knowledge to the field when they complete their training because they are trained to become teachers. One ponders why the performance of learners should declines continuously in Botswana. It is vital to add other approaches to training that can enhance teacher effectiveness. CEA encourages reflective and critical thinking which can prompt the students to be in touch with their mental process in the learning environments. For, example, intent is one of the qualities of effective mediators.

The purpose of intent is to assist students to be aware that they need to think critically, in relation to questions that they might be asked when working with others in groups before they provide answers to questions. The reasons why many students perform low in their studies is because they lack critical thinking. Responding quickly without thinking about possible answers is not right. Also, teacher centred approaches contribute to lack of intent because students are conditioned to the fact that teachers will provide them with answers for them.

Constructivism should be encouraged with students while they are training to become teachers. They can construct knowledge for themselves, and can be confident that they own knowledge and it is not facilitated by the teacher whom they should depend on. The aims of Cognitive Enrichment Advantage cannot be ignored, because it aims at teaching students to know how to learn. Thus, the principles of such teaching and learning models emphasizes that, learners who develop an understanding of their learning have the ability to develop individual learning plans that can assist them to deal with any new learning conditions. Teachers, who are effective, have information about good teaching and they should be motivated with additional models that can enhance the knowledge they have about their profession. For example, the behaviour of teachers can change particularly if the teaching environment changes positively or negatively.

Teachers who teach in remote areas may be affected by lack of resources and can develop a low teacher efficacy hence a need for approaches they add to their motivation in

their jobs. This writer concludes, let all cognitive approaches that focus on constructivism be employed as aid to learning. The Chinese proverb could be used with CEA, “I hear and I forget; I see and remember: I do and understand” (Moore, 2015, p. 9).

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ⁱ Dr. Waitshaga Tefo Smitta Moalosi is a lecturer at the Department of Educational Foundations, University of Botswana. She teaches courses in Educational Psychology. Dr. Moalosi holds the following qualifications: Diploma in Counseling Studies, Keele University, and (England). B.Sc Psychology, Bolton Institute of Higher Education (England). M.ED. Psychology of Education, Bristol University (England) and Ph.D. in Educational Psychology and Research (University of Tennessee, Knoxville (USA)). Smitta's research interests are: Teacher efficacy, classroom management, reasons for choosing teaching as a career, self- concept and adolescent development. He can be reached via Email: smitta.moalosi@ub.bw, smittamoalosi@yahoo.com.