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Improving Teaching Practices and Repertoire using the Cognitive Coaching Approach for 21st Century Teachers: A Call for Action

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Abstract
The teaching and learning enterprise require several inputs and a framework upon which the teacher's practice and repertoires are put into action and one such input is cognitive coaching. It is important to note that schools that are known to be successful have a distinction and ability to enhance teaching practices, where teachers can collaborate among themselves in designing subject materials and other professional undertakings .Additionally, the ability to inform and critique each other in an honest way has a long lasting feature to ensure growth and improvement in the individual teacher and also in the ability to sustain an effective organization. This paper provides a platform upon which the construct of cognitive coaching can be examined. The paper embodies a critical analysis of chapters two, five and seven of Newell-McLymont (2015). In Chapter two, Collaboration in the classroom context is seen as a critical component in the teaching/learning environment, bringing benefits to both teachers and the students at their disposal. Collaboration has been proven to be the panacea for eliminating teacher isolation and encourages problem solving approaches. An analytic perspective on generating the cognitive coaching approach, while bearing in mind, the power of teacher networks, is the thrust of chapter five. Chapter seven in examining the cognitive approach through application presents several studies that looked at the environment and culture as essential consideration for collaborative learning. Given the benefits of cognitive coaching, the reviewers have sounded the call for this to be fully embraced especially during the COVID 19 period of crisis.

Keywords: Cognitive coaching; Professional Learning Community**;** teacher collaboration**;** Inquiry-Based Methods**;** Mediatory Process**;** Reflective Coaching Discourse

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Newell-McLymont, E. F. (2015). *The Coaching approach for teaching and learning*. (Draft of Unpublished Book). Northern Caribbean University, Mandeville, Jamaica W.I.

Introduction

Over the years, job-entrenched proficient growth has expanded to include a variety of formats in response to the additional one-shot workshop approaches to which many educators have been exposed. The coaching approach has percolated well through the years and has been popularized in both educational and business circles. Coaching is a system of development in which an experienced person, called a coach, supports a learner in attaining a precise personal or specialized goal line by providing training and guidance (Passmore, 2016). There is a consensus among several writers that coaching as an slant to specialized progress augurs well for strong relationships, feedback, care, conversation, collaboration, answers, and bonding between veterans, experts and novices (Thornton, 2007; Knight, 2007). Others like Sullivan and Glanz (2013) claimed that cognitive coaching is as good as supervision of instruction and have long been appearing in literature as an alternative to what has always been held by professionally trained supervisors. Examining Chapters two, five and seven of Newell-McLymont (2015), *The Coaching approach for teaching and learning* will provide the platform for an analytic view of several coaching related constructs, while interpreting and evaluating the value of those chapters.

Collaboration in the Classroom Context

Chapter two elucidates on the context of classroom collaboration and emphasizes that the classroom

context begins with teacher collegiality. With it comes fostering of change and improvement of relationships among "subject-teacher collaborative learning communities, one which takes place during professional learning experiences" (p.17).

Subject-Teacher Collaborative Learning Communities

A study by Battersby (2019) argued that music educators are continually seeking new ways to better their practice and improve student learning. He described Professional Learning Communities (PLC) as a type of collaborative community that when administered successfully provide a forum for music educators to become active participants in both their own learning and that of their students. The study found that while the idea of professional learning communities has been advanced since the 1990s, they have acknowledged new consideration of late owing to the edition and execution of Danielson's popular *Framework for Teaching*, which has been applied in some educational systems of the world. Teachers are thought to be encountering a restructuring of the culture of their educational programs hence seeing their inventiveness continued will create elements that will become entrenched in a given school culture. He named features that can contribute to student learning and professional development of collective learning by teachers as; (a) supportive and collective leadership, (b) common values and vision, and (c) collective learning. The study observed that as a group, they reflected on their teaching practices, knowledge, experience and population of students and ultimately agreed on the appropriate time in the curriculum to introduce new information.

The evidence from a study by Danielson (2013) suggested that teacher collaboration and development are recognized as an attribute of a highly effective teacher, suggesting that it is an essential professional obligation. It was also shown that teachers who participate in PLCs have acquired the evidence required by administrators and evaluators to receive a highly effective rating in this category and hence PLCs can be implemented in any department. They do not need to be initiated or approved by an administrator (although including the PLCs as part of a teacher's schedule secures one's commitment). It was proposed that music teachers can initiate their own PLCs by using free software such as Google Docs or Moodle.

The results of an investigation by Goods (2018) claimed that school leaders face increasingly high demands to increase student achievement and that the professional learning community (PLC) model supports the collaboration of all stakeholders through collective vision, linguistic training, and supportive settings. School leaders were thought to be the 'catalytic agent' for initiating and supporting PLCs. Collectively, the results disclosed that the increased levels of teacher answerability were engrossed on improving student accomplishment echelons for students in all of America's public schools, which in turn has shaped an instantaneous need to foster collaboration among teachers and eventually teachers who collaborate innately improve their own and each other's capacity to practice in a professionally accepted manner.

A study by Kafele (2017), elucidated that …there are schools where collaboration among teachers either doesn't occur or A study by Kafele (2017), elucidated that …there are schools where collaboration among teachers either doesn't occur or are sometimes simply done because they are embraced with brilliant, expert educationalists, equally experienced and new. It was observed that when they embrace all their pedagogical knowledge within themselves, no one else among staff profits from their existence. The study observed that each has their own exceptional experiences in the classroom as they prepare, and each has something distinct and unique to give. The assertion brings into line with that of related research on teacher collaboration and better-quality student achievement. Teachers who collaborate can share their knowledge, skills, and their personal resources for both school and student growth. It can thus be suggested that, it is not the presence of these communities that offers the outlook for effective professional development, but the relations among teachers, together with relationships of trust and distinctiveness, thereby making communities meaningful for inspiring and shifting teachers' professional knowledge and practice (Vangrieken, et.al, 2017).

Teacher Isolation

Newell-McLymont (2015) also claims that teacher isolation tends to contribute to teacher's reluctance to explore and embrace pedagogical approaches that may challenge their expertise. That being the case, collegiality and collaboration can play a huge role to minimise teacher isolation. Cognitive coaching would therefore nurture better working relationships and offer essential support for teachers to improve their instructional effectiveness

even as they are encouraged for teachers' professional learning sessions.

Recent research has suggested that teacher isolation contributes significantly to teacher burnout—especially among beginning teachers—and is not conducive to school or educational improvement (Battersby, 2019). A study by Akinyemi, et al (2019) considered how collaboration and mutual support as the processes reputable in communities of practice can advance on-going professional teachers' development in high schools. The study can help teachers to see the importance of working in teams through mutual support assumed to each other in the enhancement of their professional development. They found that teachers contributed effectively and had mutual association in collaborative learning activities in communities of practice. The findings indicated that teachers are to be encouraged to collaborate and mutually engage in learning activities in communities of practice to enhance their professional development. The study finding revealed that participating in communities of practice helps in gaining and acquiring (a) growth in terms of content knowledge, (b) learning new methods of teaching and handling learners, (c) positive attitude to work, (d) new skills, (e)improved methodologies, (f) awards, (g) improved students' achievement, (h) teamwork and (i) correction in teachers' practices. This enables teachers to acquire more knowledge which helps them to develop as professional teachers.

Another likely explanation for communities of practice is that they enhance teacher's professional development, and hence there is need for mutual support among the teachers in such communities of learning. It is also suggested that school administrators and teachers alike, need to give mutual support to one another in dealing with matters of isolation in schools (Hord, 2016; Runhaar, 2017). Mutual support is seen to augment teachers' development in the learning communities. Teachers working in isolation are likely to inhibit professional development; therefore, shared effort from teachers with leadership provision can be of help to teachers in developing their content and pedagogical knowledge (Vangrieken, et al., 2017; Benedict, et.al, 2016; Jita & Mokhele, 2014). This is seen as a common practice in schools as teachers are willing to assist each other in which case the teachers know the meeting time, so they can make themselves available and show interest in assisting their colleagues. Ostovar-Nameghi and Sheikhahmadi (2016) explain that what one teacher considers isolation, may be seen to be individual autonomy by others and therefore means that isolation within classrooms may be construed as protection from outsiders in the class by others. On the other hand, they note that this state has two adverse consequences for both teachers and students. The first one is that whensoever a teacher is grumpy about a feeling of isolation, it is reasonable to assume an adverse impact on one's analysis and energy levels. Isolation then can result in exhaustion and state of extreme helplessness which subsequently affects students' consequences. Secondly, because of professional isolation, teachers sense that no one cares about what is to be done, henceforth they become unsatisfied at work and misplace their energy. The sensitivity of burnout that is caused by being isolated will in turn result in distressing the psychological, mental and physical health of the person. Ostovar-Nameghi and Sheikhahmadi (2016, p.204) took account of the negative effects of isolation on teachers' professional life and the inherent potential of collaboration for teacher development and growth into account, and suggested that:

- School supervisors should structure schools in ways that promote teacher collaboration and schedule classes in a way that maximizes professional interaction.
- Teachers should be able to collaborate to improve efficacy and hold regular meetings to share their problems and suggested solutions; and
- School systems should ensure that there is a movement away from the once-popular teacher training courses towards teacher study groups, peer observation of teaching and mentoring, which are conducive to constructing knowledge; rather than stick to the applied science model of teacher education which encourages teachers to passively wait for externally imposed change initiatives.

Problem Solving in Collaborative Learning

Another discussion in Newell-McLymont (2015) pertains to the understanding that collaboration is seen as a democratic way of doing things. The book names behaviours that are inherent in collaboration as including "(a) clarifying, (b) listening, (c) reflecting, (d) presenting, (e)problem solving, (f) testing, (g) advocating, (h) brainstorming, and (i) negotiating" (p.19). Collaboration is hence seen in

instructional supervision as appropriate when similar levels of expertise, involvement, and concern are shared by teachers and supervisors with a problem at hand. The emphasis in this vein is on problem solving and its consequential importance in a collaborative undertaking.

Admiraal, et al, (2019) established that in order to support professional development of teachers, there is need for schools to develop and implement a sequence of interpositions and noted that the concept of School as Professional Learning Community (PLC) can be used to frame school programmes through these interventions. In this study, data were collected through project documents, interviews with school principals and project leaders, group interviews with teachers and focus groups with project leaders and were grouped into five clusters: (a) Shared school vision on learning; (b) Professional learning opportunities for all staff; (c) Collaborative work and learning; (d) Change of school organisation, and (e) Learning leadership. These interventions were meant for teacher-leaders, team leaders and school principals who were comparatively rare. The study findings concluded that interventions resulting from professional learning communities and collaborative work and learning were frequently mentioned. These interventions included formal and informal teacher groups working and learning together. At large, the conclusions pointed to the fact that the more embedded an intervention is in the organization and culture of a school, the more sustainable it appears to be.

To understand the school level of collaboration, Schleifer, Rinehart and Yanisch (2017) undertook several studies by use of various types of data focused on school level collaboration and bore in mind the realities and limitations of the reform. The researchers showed that schools in which teacher collaboration is encouraged tend to have higher student achievement than less collaborative schools and have stronger student academic outcomes than schools that are less collaborative. Analysis of nearly a decade of data from schools in an urban North Carolina district in the United States of America showed that teachers achieved greater increases in their students' standardized test scores in schools with supportive professional environments—especially those with more peer collaboration and a positive school culture—than did teachers in schools with less supportive professional environments. Still in another similar research, an analysis of two years of data on more than 9,000 teachers in 336 Miami-Dade County public schools showed that "schools with better-quality collaboration—meaning teachers reported that their collaboration in instructional teams was both "extensive" and "helpful"—had higher student attainment advances in math and reading" (p.9).

In an attempt to develop transferable problem-solving skills, Wismath and Orr (2015) noted that problem-solving and collaborative communication are amongst the key 21st century skills educators should inculcate in students to develop. Their study presented results from collaborative work forms of 133 participants from a university level course intended to develop transferable problem-solving skills. To this end, the utmost of class time in the course was spent on solving puzzles, with negligible unswerving instruction; students were allowable to work either autonomously or in small groups of two or more, as the ideal, and to move back and forth amid the two modes as they wished. The study observed an idiosyncratic student-driven pattern amalgamating collaborative and independent effort, steadily over four course offerings in four years. The factors which appeared to be related to this variable pattern of independent and collaborative enterprise, included (a) the thinking and learning styles of the individuals, (b) the predilection of the individuals, (c) the types of problems being worked on, and (d) the stage in a given problem at which students were working. This study considered inferences of these factors for the teaching of problem solving, in conflict with the development of collaborative problem-solving aptitudes as an important metacognitive skill.

A study by Adolphus, Alamina and Aderonmu (2013) investigated the effects of collaborative learning on problem solving abilities on senior secondary physics students in Simple Harmonic Motion (SHM). Their findings showed that: (a) mathematical calculations involved in SHM make students recede from the topic, (b) students are motivated when they accommodatingly solve problems in physics, (c) there was a significant difference in problem solving abilities among students that were taught by means of collaborative learning approach and those taught with the unadventurous method, and (d) there is no significant difference between boys and girls in their problem solving abilities using the collaborative strategy. Based on the findings, they submitted that teachers should inspire group learning, group projects, tasks and assignments which enable

collaborative learning and expands problem solving abilities among the students.

Mutual trust and respect in teacher collaboration

Newell-McLymont (2015) citing da Costa (1993) further observes that the "process involved in collaborative relationships between teachers that is non-hierarchical, is predicated on mutual trust and respect, and should provide an environment that is supportive so that a teacher can implement and evaluate new teaching strategies"(p.20).

For Akinyemi, et al (2019), collaborative learning activities with mutual support are imperious in communities of practice to advance teachers' professional development. Their study showed that most teachers contributed to collaborative learning activities in their schools' communities of practice. These are processes recognised by communities of practice to improve Continuing Professional Teacher Development (CPTD). Teachers' participation in communities of practice tends to help them improve on their professional development. The study further found that there were good and supportive relationships among teachers in communities of practice in most of the high schools. Teachers enjoyed mutual relationship with one another and worked as a team instead of working in isolation. They were of the view that collaboration and mutual support enable them to gain and acquire growth in their content knowledge, where they can learn new method of teaching, have positive attitude to work, develop new skills, and thereby improve their methodologies.

In other instances, reform efforts are said to help increase the promotion of collaboration – cautioning school leaders to embrace both teachers and parents in democratic decision processes and inspiring teachers to work toward greater collaboration with their colleagues. Studies have shown that there is a significant link between (a) collaboration with the principal and trust in the principal, (b) collaboration with colleagues and trust in colleagues, and (c) collaboration with parents and trust in parents (Tschannen-Moran, 2001). This canonical correlation strengthened the standing of trust in envisaging the inclusive level of collaboration within a school. Among the set of trust variables, the study dealt with trust in clients as most significant in predicting the set of collaboration variables. Collaboration with parents was said to have been the most compelling of the collaboration variables and hence the findings argue in favour of the importance of trust in nurturing collaborative relationships.

Brewster and Railsback (2003) saw a "connection between improved educator trust and student success and concluded that the relationship between trust and collaboration should not be seen as one of simple cause and effect but that they are mutually supporting each other as the more work together, the greater the opportunity they have to get to know one another and build trust" (p.10). In the same vein, studies examining the level of trust already existing in the relationship necessitates the influences of individuals' preparedness and ability to work together; hence, the greater the trust between teachers and principals, the more likely it is that true collaboration will take place. Studies show that groups have a tendency to revolutionize faster, see errors more quickly, and find better results to problems (Tschannen-Moran, 2001).

Similarly, Bryk and Schneider (2003) pointed to schools as full of cases of teachers working together to develop the most effective learning experiences for students. In a study of 400 elementary schools in Chicago, they found that schools with high interpersonal trust were more likely to make noticeable improvements in student learning. Darling-Hammond (2014), in reporting the results of the Teaching and Learning International Survey, wrote that Organization for Economic Co-operation and Development (OECD) studies show that higher-performing countries intentionally focus on creating teacher collaboration that results in more skillful teaching and sturdy student achievement. He argues that school achievement must be seen to be much stronger where teachers work in collaborative teams and also from those that plan and work together in a systematic and deliberate manner. In an atmosphere of trust, the teachers are passionate to take the risks that new learning necessitates and once they experience the value of this kind of collaboration and they instigate the use of new strategies in their own classrooms with their students.

Modoono (2017) reported that principals can also build trust with staff members in smaller moments and gestures—through inquiring about sick family members and acknowledging life events, for instance. If teachers are seen to show compassion for their students and each other, then leaders, need to show compassion as well. Every teacher has a year that is difficult for personal reasons; whether

it involves a sick parent, a marriage in crisis, or a child with issues, there are times when teachers are not as focused on work as they would like to be. Therefore, the way leaders respond and how a community supports the individual speaks volumes about the organization and the trust that people feel.

Inquiry Based Methods

Teacher collaboration is also said to have the positive advantage in preparing teachers to use teaching techniques and inquiry based methods of teaching and providing the teacher with a means of recognising and acting upon the connections among students' experiences in the classroom (Newell-McLymont, 2015).

Recent evidence by Admiraal, et al (2019) suggests that in schools, it is customary for teachers or teacher teams to have relationships with teachers in other schools, which permitted them to share knowledge and experiences, attending workshops and seminars. The study found that three types of knowledge networks had a more formal organisation; (a) some teacher groups functioned as a PLC in school; (b) they collaboratively designed educational materials for their subjects, studied literature, shared knowledge and experiences about a particular topic and performed collaborative action research; (c) they were involved in networks with teachers from other schools, organised by one of the schools or a teacher educational institution. Olsson (2019) also proved an important genre when several benefits with PLCs were pointed out. It is recorded that the benefits include (a) perceptions of increased professional learning and enhanced teaching efficacy among teachers, (b) actual changes of teaching practices, (c) overall movements toward more collaborative school cultures, and (d) improved student learning. Taken together, this suggests that there are good reasons to pursue the development of PLCs, not the least in other school system where empirical evidence suggests that the type of collaborative professionalism facilitated by PLCs is underdeveloped.

A study by Lepareur and Grangeat (2018) explored the issue of teacher collaboration on inquiry-based science teaching methods and used the common models applied for understanding professional activity. In that particular study, the emphasises was on the importance of teachers' professional knowledge and development of constructs (otherwise outlined as teacher process knowledge, activity systems and the six-dimensional model), which supports in understanding the implementation of a specific teaching activity (i.e. inquiry-based science teaching).In the study, collaborative activities are seemingly there to modify the stated three teachers' professional knowledge, content-centred approaches and practices progressively focused more on student learning and on conditions favourable to knowledge acquisition. The study further states for an additional caveat: inquiry-based teaching as only part of a larger set of practices constituting "high-quality" or "effective" teaching in general. Teaching strategies practices could offer an interesting tool for teachers since, by reflecting on it, they may become aware of their current focus and their possible lack of attention to other dimensions. This, the study argues, should enable them to discuss their diagram with other teachers as part of determining how to overcome gaps and for sharing their "best practices" (p.375).

Lai, Guo, and Tsai (2014) examined the effects of a particular intervention that used a collaborative teaching approach and inquiry-based learning (IBL) on the development of grade six students in information literacy (IL) as well as information technology (IT) skills in Taiwan. What was found from this study was that teachers played indispensable roles in the preparation of students with IL and IT skills as they collaborate and engage in instructional content design. This ultimately improved the score of students' IL and IT skills after employing the IBL. The students reported this encouraging impact of collaborative teaching and IBL on the development of their information literacy and IT skills. There was also found some evidence from Magee and Flessner (2012) who examined the effect of promoting inquiry-based teaching (IBT) by means of collaboration between a science methods course and mathematics methods course. During the collaboration, Preservice Elementary Teacher (PST) candidates are said to have experienced different types of inquiry to foster augmented understanding of Inquiry-Based Teaching (IBT). These experiences comprised of a PST driven science inquiry and a mathematics inquiry where PSTs were learners and a science inquiry were PSTs teachers. It is reported that student work and teacher field notes were able to recognise, challenge and wrestle with the intricacies of IBT.

Byker et al (2017) used a case study method to examine the impact of an inquiry-based learning

program among a cohort of a large public university in the south-eastern United States who are aspiring to become teachers. The Boyer Commission (1999) is cited as having asserted that inquiry-based learning should be the foundation of higher education curricula. However, even if the inquiry pedagogies are emphasized in teacher education, it is said that many prospective teacher candidates have limited experience with inquiry as a constructivist practice from their K-12 settings. The research was grounded in Knowledge Building Theory. Scardamalia and Bereiter (2006),posit that knowledge building is comprised of three components: (a) inquiry driven questions, (b) epistemic artifacts, and (c) collective spaces for collaboration. The study found that inquiry projects had positive effects on participants' understanding of: (a) the complexity of educational issues; (b) the overall inquiry process; and (c) a future career in teaching. Regarding the use of Knowledge Building Theory, the findings were discussed and scrutinised to postulate a conceptual model of the whole inquiry process, called the Inquiry Processing Cycle.

Cantalini-Williams, et al (2015) examined a collaborative inquiry process, enabled by university faculty in an elementary school, with the intention of developing a research community, foster knowledge mobilization, and enhance student engagement. The study's findings indicated that the collaborative inquiry process with enablers of time, flexibility and support from university faculty, increased educators' research acumen and student engagement in classrooms. It is believed that inquiry-based instructional approaches are an effective means to actively engage students with science content and skills (McKeown, et al, 2016). Their study examined the effect of ongoing professional development programs on middle and high school teachers' efficacy beliefs, confidence to teach research concepts and skills, and science content knowledge. Findings across different times pointed to suggest that participation in the professional development program strongly influence participants' fundamental beliefs about their capacity to provide effective instruction in ways that are closely connected to the features of inquiry-based instruction.

Tal, Levin-Peled, and Levys' (2019) study confronted science teachers' views of inquiry-based learning as being simply investigational, causal, and controlled. Other themes that emerged from the study included the place of collaborative learning, the use of technology, and the role of the outdoor environment. The study found a somewhat clear shift in teachers' views about inquiry which ranged from imprecise explanations and accounts of inquiry as merely student-centered learning, to views that are sophisticated. The teachers cherished the outdoor environment exceedingly for learning and provided interesting acumens into how to integrate in-school and out-of-school learning. Collaborative learning reinforced by technology was alleged to be an effective vehicle for meaningful learning. An incomplete move into the highest epistemic explanations is explained by deficient opportunities for face-to-face explicit discussions about scientific inquiry and inquiry-based learning.

Student Collaboration

As it relates to student collaboration, the book under review argues that in classrooms that are collaborative in nature, students feel that their classmates want them to learn and hence afford them to the opportunity to talk with each other as they work together on classroom activities. Newell-McLymont (2015) cites Brown (1997) who maintains that effective learners operate best when they access their own repertoires of strategies for learning and insights into their own strengths and weaknesses. Such an environment therefore helps them to generate thinking about their thinking, problem solve, and reflect. This metacognitive environment, in which students are engaged in reflective practice most of the time is said to generate an atmosphere of wondering, querying, and worrying about knowledge (Brown 1997) as cited in Newell-McLymont (2015).

Basing their study on grounded theory analysis, Le, Janssen, and Wubbels (2018) identified four common impediments to collaboration namely: (a) lack of collaborative skills among students, (b) free riding, (c) competence status, and (d) friendship. The results showed three interconnected experiences that contribute to these hindrances and central to these experiences is the strong focus of the teachers on the cognitive aspects of collaborating Learning (CL), which ultimately lead to the contributing teachers neglecting the collaborative aspects of CL. These experiences were established in the ways teachers set CL goals, provided instruction, and assessed student collaboration. Within the higher educational situation, Popov, et al. (2012) showed that communication problems, caused by a deficiency in collaborative skills, may constrain first-year students

in their master's programme from engaging in group work and contributory to group outcomes. Collectively, these studies suggest that lack of collaborative skills may possibly be antecedents of the collaborative problems students often experience during CL. It is thought by Le, Janssen and Wubbels (2018) that feeling unrecognized can cause one to reserve their responsibility for and effort in doing group work. Their study demonstrated an overtone between the second antecedent (instruction) and the obstacles, for example, students' lack of collaborative skills and friendship. When teachers do not emphasise on instructing collaborative skills, students find problems engaging in collaborative work. Therefore, inexpert group members may be incapable to perform collaborative tasks effectively, such as not being able to argue positively as well as critically. The third antecedent (assessment) could be connected to the obstacles, for example, competence status. It has been observed that when teachers predominantly concentrate on group output without concomitantly assessing the collaborative performance, group members may not be urged to reinforce social interaction and mutual help for anyone to benefit from collaboration. Consequently, low-status students may feel unconfident to participate in collaborative work, thereby not benefiting from the collaboration. These links between antecedents and obstacles emphasise the need to examine whether and how the manipulation of these antecedents as well as obstacles can influence student collaboration.

Generating the Cognitive Coaching Approach

Chapter five of Newell-McLymont (2015) is based on the generation of the cognitive coaching approach in which professional learning experiences are thought to be designed to "help teachers from the dependence of the traditional ways of teaching to accommodative approaches that maximises student learning in as far as the regular mathematics classroom is concerned, by use of the cognitive coaching" (p.64). The chapter describes how teachers drew from their experiences of their professional learning process and decisions on generating alternative approaches. The interaction from professional learning experiences is said to have led to a network of interactions among teachers they collaborate with, a mediatory process that ensures that various teachers bring to the table different perspectives in the approaches used in teaching, and learning in mathematics.

Network of Interactions among Teachers

Talking about network of interaction among teachers, Vuorikari, et al (2012) considered teacher networks as simply learning networks: technology-supported communities through which learners share knowledge with one another and jointly develop new knowledge. The purpose of teacher networks is henceforth to contribute the quality of the teaching profession and also the learning experience of students in their varied stages, by encouraging collaboration and knowledge conversation at both teacher and student level. They note that the unparalleled opportunities fetched by networking tools empower teachers to network and collaborate with other teachers from anywhere, at any time. Such development in the profession of teachers is a significant aspect which cannot be ignored when discussing the future of education. The author laments that teachers tend to "feel isolated in their own schools and are often confined to a single school experience because tight timetables and overloaded curricula do not allow them much time to be innovative" (p.16). It is interesting to note that much of the literature sources in education have explored a vast array of research addressing teachers' professional development and some focus on alternative approaches of addressing professional development to which the cognitive coaching approach is one of them.

Gerdeman, Garrett, and Monahan (2018) emphasise that teacher practice networks have emerged as a potential mechanism to support teacher professional learning and supplement other types of professional development available to teachers and can largely be conducted by the cognitive coaching approach. They argue that Network organizations can take many forms, but in general, they support teachers and their instructional practice by (a) the provision of access to instructional materials, (b) provision of adequate training and support in the use of instructional resources and strategies, and (c) empowering teachers to connect with a network of fellow teachers to support instructional advancements. A study by Krutka, Carpenter and Trust (2016) explicated that Professional Learning Networks (PLNs) are "uniquely personalizedand complex systems of interactions consisting of people, resources, and digital tools that support ongoing learning and professional growth" (p.35) that have improved in acceptance with the rise of social media. They presented a model for teacher educators and teachers considering key elements of

PLN experiences: engaging, discovering, trying out, reflecting and sharing. They argue that this model could make provisions to educators both as a window of possibilities and also as a mirror for reflection as they build and improve their PLNs.

Newell-McLymont's (2015) study revealed that direct teaching, being one of the traditional approaches to teaching has not done much in optimizing learning in schools because teachers do not lack subject content knowledge. The study makes these assumptions after an analysis of the Caribbean Secondary Education Certificate (CSEC) which suggested that for "an approach that would bring about learning to understand and also overcome some of the aspects that make it hard for students to have an ideal learning experience especially in mathematics" (p.65). This ideal learning experience would then help students understand basic concepts based on their responses to mathematical problems. What therefore is needed is a well understood program that can describe and demonstrate precise illustrations of instructional discussion and other types of cognitive coaching; identifying instructional provisions that are used to promote active learning by students; models questioning techniques and student interactions, including the means by which cognitive coaches keep student conversation focused and productive; and considers the role that authentic and ongoing assessment plays in cognitive coaching.

Ideal Learning Experience

The ideal learning experiences ensure that good teaching, like good coaching, is considered as an instructional conversation in which the participants exchange ideas, build motivation, and develop strategies for improvement. This would see to it that teachers encourage students to employ strategies for success by providing cognitive coaching or "active teaching" by communicating with their students, focusing on development, motivating their students and sharing in their students' performance. Additionally, the teaching methods used by teachers make students unable to perform well in their learning environments, in which case students were exposed to too much teacher talking without showing the how and letting students have hand-on type of learning experiences. This is where the exposure to mediatory process comes in, to be able to enhance interactive use of the various tools of cognitive coaching approach, as learners would be given the opportunity to analyse the teaching and learning implication in the subject.

Costa, et al (2016) indicated that cognitive coaching is grounded on some central views about teaching and human growth and learning. They believed that human beings have capabilities to change, that everyone continues to grow in a cognitive manner in one's lifetime and that all hold a vast reservoir of unused potential. They further believe that teaching should not be reduced to a formula or a recipe. There is a vast amount of evidence today about explicit instructional behaviors which are able to produce particular student learnings. The authors however, explained that in such process-product research studies, there were always found certain teachers who did not make use of these behaviors but obtained good results in student learning. Still other teachers who did use all the behaviors produced poor results. Thus, they concluded that while we have knowledge about teaching, we do not have certainty about teaching.

A study by Gonzalez-Del (2015) used data from semi-structured interviews and coaching conversations to identify some emergent themes: the elements of reflective practice, creation of new instructional applications possible, embracing the diversity spectrum, facilitation of teacher-driven learning, and promoting shared responsibility. The results of this study indicate that teachers who contributed in cognitive coaching believe that they (a) are able to reflect on their practice more and on a deeper level, (b) they usually and intentionally plan their instruction, (c) are capable of adjusting their instructional plan in response to their students' needs by using supplementary formative assessments, and (d) had a tendency of valuing their work with the cognitive coach. In addition, cognitive coaching is connected to more responsive teaching, especially with lingually diverse students.

Model of the Mediatory Process

The study by Newell-McLymont (2015) also shows that teachers, after observing the model of the mediatory process, may be introduced to a similar concept, which may show the role of a mediator in the didactic mode of teaching. A study by Mahdi and Alsaadi (2013) which aimed at finding out the consequence of the mediator on scaffolding among fourth year student-teachers' teaching competencies and their self-efficacy found that when scaffolding and self-efficacy are blended by the use of a mediator on scaffolding, students affect teaching competencies and self-efficacy. The model was thought to affect their teaching competencies and led them to be aware of the needs of their

pupils and themselves. They claim that the mediation model is proved to be dynamically working model because it both guides and develops by means of the social interaction occuring during the learning activity. It has also been suggested that during this process, the teacher makes and uses action applicable knowledge personalised to the learning context. It is taken that people around learners act as mediators who would be the parent, facilitator, teacher, or any identifiable significant other who plays the deliberate role offering explanations, emphasis, interpretations, or extension of the environment so that the learner is able to build a meaningful core model of the framework or the world that has been experienced (Cheng, 2011) as cited in Mahdi & Alsaadi (2013).

A study by Copriady (2015) which examined teachers' motivation as a great mediator for teachers' willingness in applying ICT during the teaching and learning process found that teachers' motivation is a mediator on their willingness to apply ICT during their teaching experience. The study found that teachers' motivation is seen as the most important factor in ICT readiness and a positive correlation between self-motivation and ICT readiness was identified. General, the result of the study can be used as a framework to develop and popularise ICT usage especially during cognitive coaching at all levels of education and across disciplines. The study further argued that technology readiness and the process of adaptation is positively correlated with the type of teacher's attitude and their motivation towards new technology. Therefore, the preparation and training of teachers in this way ensures that they embrace technology with paramountcy importance which needs to be taken into account by all stakeholders. Technology could be one of the tools that Newell-McLymont (2015) emphasised when it was claimed that "the use of tools of cognitive coaching can possibly serve as a vehicle for addressing the need for an alternative approach for the teaching and learning as an approach, due to its level of reflection what is usually generated to make meaning of someone's action and in the learning and teaching environment one is found" (p.74).

Reflective Coaching Discourse

The study by Newell-McLymont (2015) further found that "the coaching approach induced reflection in which students are able to make meaning of their thoughts and experiences together with the provision of continuity to the development of ideas where reflective coaching discourse are usually generated" (p.78). When discussing reflective coaching discourse, Cushion (2018) emphasised that reflection and reflective discourse should be a reputable part of coaching and coach education practice that is vital to learning. He claims that it has become a 'taken-for-granted' part of coaching that is rightly accepted enthusiastically and whole-heartedly and is presumed to be 'good' for coaching and coaches. The study drew on numerous sociological concepts, a principally Foucauldian lens, to provide a critical analysis of reflection and to unpack some of the assumptions that underly it and problematize the seemingly unproblematic. This investigation challenged the current dominant cognitive assumptions about reflection (and coaching) as an individual, a social, a historical process and explores through concepts such as power/knowledge, discourse and the self, the extent that reflection is discursive and constructs coaches' subjectivities. The analysis considers unintentional consequences of reflection as a form of scrutiny that standardises coaches' practices through the act of admission. It's worth noting that although coaching is used in many schools to facilitate teachers' professional learning, few studies look closely at coaching discourse.

Additionally, Heineke (2013) explored how coaching facilitates teachers' professional development and used tape-recorded coaching sessions and individual post interviews to scrutinise the one-on-one coaching interactions with four elementary coach/teacher pairs. Coaching roles, relationships, and authorised testing arose as dominant circumstantial factors. Teachers attributed changes in their instruction to their literacy coaches and suggested that coaching can lead to teacher learning in an effective manner. However, the author admitted that coaches need to become more knowledgeable about and skilful in their use of verbal moves and coaching deportments.

Experiencing the Cognitive Coaching Approach

The seventh chapter of Newell-McLymont (2015) examines the application of cognitive coaching approach experience in which the professional experiences were translated to generate student collaboration and the Mathematics Learning Experiences (MLE). To this end, the book argues that the teachers and students are said to have shared their experiences including having their voice apprehension in approving the MLE. It is argued that the formal application of the tools of cognitive

coaching serves to generate an experience for teachers that deal not only with the instantaneous principles and the techniques of the cognitive coaching experience but also with those who exceeded the borders of cognitive coaching. This, therefore, tends to generate similar learning experiences for students and teachers as they internalize these tools and measure them as the main pillars of their own experiences upon which the environment and the culture for collaborative learning among students should be built.

The Environment and Culture for Collaboration

Economides (2008) observed that in a collaborative learning environment, there are always several learners with diverse values thereby needing to have a mechanism for support that should be communicated and collaboration amongst themselves underscored. It is noted that the variability of the communication and collaboration tools and approaches available to each learner would depend on his/her personal cultural background. The study proposed for an adaptation of the collaborative learning environment to the learner's cultural profile with an aim to present learner's models with respect to his/her cultural characteristics and also to present the various communication and collaboration tools and modes that would be available to the learners. Then, each learner has at his/her disposal the appropriate communication and collaboration tools and modes according to his/her cultural characteristics. The study further presented learner's cultural models across several cultural dimensions with each cultural dimension weighted differently. Also, a learner may not be in the right place strictly to a cultural extreme of a given dimension; however, it may be found that there may be characteristics from both cultural extremes of each dimension that can be considered. Built on a learner's cultural profile, the learner would then be availed with different communication and collaboration tools. The authors are of the view that those who design, develop and evaluate collaborative learning systems may benefit from these learners' cultural models and the communication and collaboration features even as they produce collaborative learning systems that are flexible in both communication and collaboration attributes to provide each learner a tailored communication and collaboration tool according to ones' cultural profile. Recent studies that focused on Western students seemingly indicate that online collaboration improves student learning achievement. Yet few empirical studies have analyzed student satisfaction and performance through online collaboration from a cross-cultural perspective. The study examined student satisfaction and performance in online collaborative learning involving students in two different cultural contexts (Zhu, 2011).

Kumi-Yeboah, Dogbey, and Yuan (2017) considered the perceptions of minority graduate students toward online collaborative learning activities. The data analysed identified six themes on the perceptions of the marginal graduate students toward online collaborative learning activities including: (a) a semblance of building and construction of knowledge, (b) a preference towards working in small-group over whole-group activities, (c) available opportunities of sharing and leading discussion in cross-cultural online setting, (d) activities that collaboratively aid in meeting their learning and communication styles, (e) challenges in dealing with existing cultural differences, and (f) a common lack of multicultural inclusion in the curriculum/course content. The findings of the study suggested that instructors who are tasked to teach online courses should consider the benefits, preferences, and challenges of students from diverse cultural backgrounds as they participate in online collaborative learning activities. According to Arvaja and Häkkinen (2010) collaborative learning is a fashionable phenomenon nowadays; however, collaboration among students in various learning settings (e.g., in classrooms) is a much more complex phenomenon than has often been thought. While aiming to understand the varied viewpoints to collaborative learning, the study measured an extremely complex set of variables (cognitive, social, emotional, motivational, and contextual ones), networking with each other in a systemic and dynamic manner concentrating particularly on the social aspects of collaborative learning.

Cognitive and Metacognitive Operations

Beyer (1987) as cited by Newell-McLymont (2015) is of the view that the engagement of teachers in coaching discourses between and among them, the kind of thinking that occurs involves the use of previous knowledge, one or more cognitive operations, and attitudes that differed from those that would have occurred if teachers had been engaged in reflective thinking alone by themselves. Two of the operations involved in thinking are said to be cognitive and metacognitive operations. Metacognition, according to Jaleeland and

Premachandran (2016), means thinking about one's own thinking. They recognised two features of metacognition: reflection (thinking about what we already know) and self-regulation (managing how we go about learning). Collectively, these progressions are thought to make up a significant aspect of learning and development. By developing these metacognitive abilities is not only about becoming reflective learners, but also about obtaining specific learning strategies as well. Areas such as metacognitive beliefs, metacognitive awareness, metacognitive experiences, metacognitive knowledge, metacognitive skills, executive skills, higher-order skills, metacomponents, and metamemory are some of the rapports that we often use in connotating with metacognition. Metacognitive awareness simply implies having a consciousness of how one thinks and the strategies one is used effect. It enables students to be more alert of what they are doing, and why, and also how skills learnt might be used differently in different situations. The authors tried to analyse the metacognitive awareness of secondary school students by using standardized awareness inventory for the usual checking of the metacognitive awareness of secondary school students and found that significant differences exist between the various sub samples studied that included gender, locality and type of management of school based on metacognitive awareness.

Fooladvand, et al (2017) claimed that the fact that there exist diverse researches on the connection between learning strategies and academic achievement indicates the constructive and effective influence of these strategies on the learning process. In their study, they used the systematic review method with the aim of investigating the effect of cognitive and metacognitive strategies on academic achievement and concluded that their findings from different researches indicated that learning strategies such as cognitive and metacognitive strategies have the most effects on academic achievement of school and university students in different programs of study. Overall, it can be said that learning strategies, from each type (cognitive and metacognitive) in all learners regardless of gender are very effective on the degree of their learning in different courses, be it social or natural sciences.

Cahayasti and Indrasari (2017) examined the association between the use of metacognitive strategy on the completion of mathematics word problems and mathematics achievement among grade three elementary students. The results indicated that there was a significant positive relationship between the use of metacognitive strategy and mathematics achievement among grade three elementary students ($r = 0.35$, $p < 0.01$, 1-tailed). Consequently, students who used metacognitive strategy in mathematics learning exhibited good mathematics achievement too. In another study by Wonu and Paul-Worika (2019), they explored the efficacy of metacognitive instructional strategy in the enhancement of the knowledge of cognition among junior secondary students with Mathematics Disability (MD) in everyday arithmetic. The findings, among others, established that the metacognitive knowledge of students tremendously improved over time; and there were significant key effects of metacognitive strategy on student procedural, declarative and conditional knowledge correspondingly. They recommended that teachers should adopt the metacognitive strategy while teaching everyday arithmetic.

In justifying the importance of problem-solving skills, Masduki, Kholid, and Khotimah, (2020) reported on students' problem-solving abilities and responses during lessons involving metacognitive strategy in learning. They claimed that performance of the students' problem-solving abilities increases after involving metacognitive strategy in learning. Students can provide a positive response while engaging a metacognitive strategy in learning. Wischgoll (2016) wanted to test whether the development of academic writing skills would be effectively reinforced by training single strategies or even collective strategies. The study stated that metacognition must be seen to be an important skill for innovative and adult learners including that there are quite a lot of benefits of collective cognitive strategies that could be noted without a metacognitive strategy. Thus, the study's results could be underscoring the standing of self-monitoring strategies in academic writing.

Planning Collaborative Teacher Conferences

One major stride in the study is how teachers regard conferencing. Teachers are said to have suggested that the planning conferences have a way of giving encouragement through preparation of lessons, enhanced conceptualization of mathematical concepts that teachers wish to invite students to learn, encourage flexibility and openness to various solution paths students might take, and encourage

teachers to become aware of alternative strategies they might want to suggest that students utilise to arrive at a solution to problems as students continue the ripple effect among themselves using the tool of questioning (Newell-McLymont, 2015).

Anast-May, et al (2011) purported to investigate teachers' perceptions of conferencing with feedback. The findings stated that observations need to ensue recurrently and for a long period of time and ensuring that critical systematic feedback for teachers are made in improving performance, motivation and personal satisfaction. Hence, an innovation such as conferencing, is proposed to be in place to promote reflective inquiry and conversations for facilitating learning of teachers. The results reinforce that teachers often do not experience frequent and extended observations, systematic feedback and a structure to promote reflective inquiry. The process of evaluation, accordingly, should involve conferencing and feedback that will lead teachers to construct their own understandings and set professional goals that are measured in terms of student learning.

Summary and Discussion

Given the nature of the environment in which teaching and learning take place especially with the advent of the COVID-19, it has become apparent that some of the much ignored practices in the school systems that have ended up on paper without practicing them for better teacher and student achievement be revisited. Cognitive Coaching should therefore be one of the vehicles by which teachers should be able to examine how they can get the best out of it in theory and practice. Teachers should be encouraged to embrace a particular cognitive map and practice cognitive coaching principles with the spirit it deserves. School leaders and teachers should be processed in such a way that their thinking enables them to articulate clear and decisive practices so that their awareness to coaching principles is enhanced. The teaching enterprise must not be seen to have a one way of effective practicing.

We can see from the foregoing discussion that cognitive coaching encompasses several elements that have not been tapped in the school systems in ensuring effectiveness and efficiency on the part of school personnel. There is adequate information available in the 21st century about mandatory instructional behaviours in today's teaching practices. This must be emphasised to include collaboration which augurs well for effective learning. For example, De Jong, Meirink and Admiraal (2019) aptly maintained that teacher collaboration is an important aspect of teachers' professional lives, as a means to continuously reflect on and improve the practice of teaching and that in the collaboration process, teaching practitioners are able to share knowledge, critically reflect on teaching practices, provide uncompetitive support and to some extent, peer feedback, and jointly design teaching methods. They maintain also that trust is the foundation for collaboration, and collaboration is what makes organizations excel.

Other elements of cognitive coaching discussed are as important as collaboration as there is an interaction in them. Notwithstanding that such practices like cognitive coaching may have some practitioners who may not be agreeable with the use of such behaviours, it should be agreed that such practices have a way of increasing student achievement. It should also be noted that having knowledge about teaching does not necessarily imply that one is certain about teaching. Consequentially, Gonzalez (2015) contends that teachers and school leaders who practice cognitive coaching see it as an opportunity to focus on their needs, rather than contribute in regular professional development sessions which as they remark do not address their explicit needs. Teachers' proprietorship of their instructional practice increases because they can have a feeling of working on the facets that are relevant to their students and their personal and professional development. Hence cognitive coaching could grant school leaders and teachers a chance to focus on a very specific part of the initiative rather than go through a general professional development session. The other assumption about cognitive coaching is the idea of it being associated with teaching and human growth and development. This notion has to do with the fact that as human beings, we all have the capability and capacity to change in a meaningful way in so much that we continuously grow in a cognitive manner even as we live our lives. Related to that is the argument that every human being is a well of vast pool of unexploited potential thereby by implication, everyone needs to be reminded on what it is that should be done by those who may be aware of the phenomenon of life.

Another fundamental aspect that has arisen in the literature are the teachers' and school leaders' evident classroom performances which are basically

based upon core, indiscernible skills-thought processes that tend to drive explicit skills of teaching. As noted earlier on, trust is the one fundamental goal in the cognitive coaching dilemma. Trust among each other as professionals, trusting the climate and environment in which practitioners are found and trusting the coaching process is of' paramountcy. Cognitive coaching can also allow others with the expertise and skill to enlighten their fellow practitioners as mediators to enhance the teacher's cognitive processes and support teachers' line of awareness and decision-making that would ultimately produce some meaningful subsequent teaching behaviours. We therefore contend that all learning requires a particular engagement of a revolution of the mind to have a different way of teaching that requires specific thought processes which cognitive coaching tend to provide in a conscious manner.

Lastly, given the space into which we find ourselves with the COVID-19 pandemic, there are constraints in terms of time and physical space for meetings and teacher conferencing. As it were, the availability of emerging technologies could be of help if teachers and their supervisors can find ways of incorporating cognitive coaching aspects so that shortcomings like teacher isolation, negativity in professional development, and problems in student achievement can be addressed. Only then can there be fundamental changes within our school systems.

Conclusion

Success in any school venture is dependent on the type of innovations and activities that teachers and their supervisors engage in, with the sole purpose to improve student achievement and effective professional practices. Given a growing body of literature on many aspects that have to deal with teaching practices (cognitive coaching inclusive), it is imperative for teachers and school leaders to work more collaboratively in many areas that are commonly not introduced in teacher training colleges; areas that may be contributory in student achievement and improvement. The earlier school leaders and teachers realise that a focus on evolving teaching and learning by nurturing collaboration can improve teachers' practices, the better the schools will be. It is fair then to say that the reviewed chapters have struck the right chords in the whole matter of cognitive coaching and have much value for veterans and beginning teacher educators.

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