PEDAGOGY APPROACHES AND TEACHING STRATEGIES FOR INNOVATIVE TEACHING

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Abstract
Innovation in teaching and learning has become a significant growth area in recent years. Innovative teaching strategies have evolved to transform the way teachers teach from the traditional 'chalk and talk' method to creative and lively teaching methods. The use of innovative methods in teaching has been proven to be more effective learning tools in enhancing teaching and learning and improving students' motivation in learning and their academic performance. Therefore, this calls for a paradigm shift from lecture-based method to active learning strategies that focus on effective teaching and promote creative and critical thinking among the students. This concept paper seeks to inform and suggest useful innovative teaching strategies that can be employed in imparting knowledge to the students namely problem based learning and cooperative learning.
Keywords: Innovative teaching, problem-based learning, cooperative learning.

Introduction

Education equips learners with the essential knowledge, skills, attitudes and values to face the challenges in this rapidly globalizing world. Gillard et al, (2008) indicate that schools play an important role in developing the "intellectual, social, physical, emotional, spiritual, moral, and aesthetic development and well being of the learners". Education empowers people to be able to contribute to their society and thus, ensuring sustainable human and economic development and social cohesion among the nations at large. The primary reason given for schooling is to widen and deepen their knowledge base across various disciplines and subjects. These not only include the basic reading, writing, and mathematics, but also literature, science, humanities, as well as foreign languages. With vast knowledge in these areas, it may produce individuals who are highly knowledgeable and competent and could contribute to the nation's productivity. Additionally, Sachou (2013) asserts that education is a key for the development of a society. It does not only impart knowledge, skills and values, but it is crucial in the development of human capital. Due to this reason, there is a need for an innovative approach to education that empowers students to succeed in this globalized world.

West & Farr (1990, p. 9) define innovation as an "attempt to bring about beneficial change" (as cited in Waters, 2009). On the other hand, Thompson's (1965, p.2) states that "innovation is the generation, acceptance, and implementation of new ideas, processes products or services". A rather similar definition of innovation was put forward by West & Anderson (1996), "Innovation can be defined as the effective application of processes and products new to the organization and designed to benefit it and its stakeholders" (Baregheh et al, 2009). More recently, Carless (2013) portrays innovation as "an attempt to bring about educational improvement by doing something which is perceived by implementers as new or different". Examples of innovation in education include new pedagogy approaches such as problem based teaching, different types of teaching aids and materials, integration of technology in classroom as well as alternative assessment methods.

According to Bruce (1989), innovation in teaching approach refers to learning that involves interaction between the learner and the learning environment and when teacher infuses classrooms with technology, making it as tools to enhance learning. Meanwhile, Wu (2002) in Lee (2011) points out that teaching innovation is inferred to as when teachers apply a variety of teaching strategies and integrate diverse and rich content in the classrooms. Through diversified and lively teaching methods, it stimulates students' inner interest and motivation in learning, which in turn, increases students' learning ability. This paper will discuss pedagogy approaches and teaching strategies for innovative teaching namely problem based learning and cooperative learning, both innovative and participative teaching and learning approaches that challenge the conventional teaching method.

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Problem-Based Learning

The conventional teaching methods are basically teacher-directed and abide solely by the text books. Though it is being practiced over the past decades, this approach has not provided students with valuable skills and a body of knowledge that lasts a lifetime (Udovic et al, 2002). This is the case because in traditional method, teachers assume the role as the primary source of knowledge, while learners solely sit and listen to the teacher, thus, serve as passive receivers of knowledge throughout the learning process (Abdullah, 2007). Students are expected to listen attentively and they generally play very little part in their learning process and students become passive knowledge seekers. Therefore, to enhance the quality of teaching and learning in the classroom, teachers need to utilize innovative teaching strategies that promote active and authentic learning experiences such as problem-based learning.

Kilroy (2004) describes problem based learning or PBL as an approach in learning and instruction which suggests that learners need to be stimulated by presenting them problems that need to be solved in order to ensure effective acquisition of knowledge. In solving the problems, learners will reorganize information they already know to gain new knowledge and then elaborate on the new information they have learned by discussing it in a small group or by writing a report. A rather similar definition of problem based learning is proposed by Chen (2008), "problem-based learning is a curricular design and pedagogical method which focuses on the learner, using real-life problems and situations to stimulate students' learning". In addition, Barrows (2000); Torp & Sage (2002), concur that PBL is "focused, experiential learning organized around the investigation, explanation, and resolution of meaningful problems" (Hmelo-Silver, 2004). In PBL, students usually tackle the problems in small collaborative groups and discover knowledge needed to solve the problem.

There are various benefits for students participating in PBL. Problem based learning encourages students to be actively engaged in their learning process, unlike the traditional instruction discussed earlier. Students learn to take responsibility for their own learning, learn how to manage their time effectively, seek needed resources to solve the problems and evaluate validity of the sources and thus, promote better learners (Karabulut, 2002). In addition, since there is no single correct approach or solution to the problems, students are required to apply a wide variety of skills in solving the problems. Kvapil (2009) affirms that newly acquired knowledge that is dynamically used is most likely to be stored in students' long term memory. This is in line with the research conducted by Duffy & Cunningham (1996) & Stenberg (1998) which found that information gained through problem-based learning is retained longer and transfer better (Eggen & Kauchak, 2006). Apart from being active learners, students involved in problem-based learning also tend to interact more with their peers and apply higher level thinking skills as the students seek numerous ways to utilize sources compared to students in lecture-based course.

Eggen & Kauchak, (2006) outlined three characteristics of problem-based learning models. First, PBL begins with a problem or question that acts as the focus for the students' investigation (Duffy & Cunningham, 1996; Grabinger, 1996). In a lesson, questions given by the teacher to the students provided a focus for the students' inquiry and become a framework to students' investigation. Second, students assume primary responsibility for investigating the problem and become an active learners in the learning process (Slavin, et al 1994) and lastly instead of lecturing, the teacher takes on the role of a facilitator and facilitates the problem solving process by guiding the students' efforts and provides support when necessary (Stepien & Gallahger, 1993). In regard, learning to design and complete investigations is the ultimate focus in problem-based learning lessons.

Theoretical Foundations of Problem Based Learning

Problem-based learning is essentially derived from two conceptual and theoretical foundations. One of these is the theory of pragmatism by John Dewey, who emphasized the importance of learning through experience. Meanwhile the second theoretical foundation is sociocultural learning theory by Vygotsky, a cognitive view of learning that challenges the traditional teaching method where it emphasizes student participation in authentic learning activities

John Dewey's Pragmatism

John Dewey (1859-1952) is presumably the most influential educational philosopher in America. His views particularly about teaching and learning and the place of schools in society had a major impact on educational thinking in the early part of the twentieth century and are still influencing teaching and learning today. Dewey strongly believed that "children are socially active learners who learn by exploring their environments" (Dewey, 1902, 1916), therefore, in order to maximize learning, schools should cater to this natural curiosity by bringing the outside world into the classroom. By doing so, students are able to acquire various skills and apply the knowledge they have gained. The knowledge, instead of being inert as obtained from text books and lectures, becomes more useful when it is applied to the solution of problems, thus knowledge obtained is meaningful to the learners. Hence, to improve the quality of teaching and learning, a person's education should incorporate actual life experiences or what is known as 'authentic learning'. Authentic learning describes learning that focuses on real-world problems and their solutions. Among authentic learning activities that can be carried out in the classroom are role-playing exercises, problem-based tasks, case studies, and participation in virtual exercises. Lombardi (2007) also concurs that students are generally more motivated by solving real-world problems and they often express a preference for *learning by doing* rather than listening to lectures.

Dewey (1916) in Eggen & Kauchack, (2006), emphasized that in studying the natural world, students should be involved in active inquiry which has the following characteristics:

- Learners are involved in a real-world experience that intrigues them.
- Through this realistic experience, learners encounter a problem that stimulates their thinking process.
- In solving the problem, learners acquire essential information.
- Learners develop appropriate solutions to the problem.
- Learners test these solutions. The application helps the learners validate their knowledge.

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Vygotsky's Sociocultural Theory

Sociocultural theory is a "cognitive view of learning that emphasizes student participation in communities of learning" (Vygotsky, 1978, 1986 in Eggen & Kauchack, 2006). Vygotsky stressed the importance of social interaction in learning process and suggested that teachers need to create learning environment whereby students will be able to learn by exchanging and comparing their ideas with one another. Through discussions, students become active participants in the learning process. In addition, Vygotsky (1978) also proposes that learning is not only an individual matter, but rather develops within social development (Hall, 2007). Therefore, social environment is regarded as focal point of learning, and without which, the "development of the mind is impossible" (Cole & Wertsch, 2001 in Hall, 2007).

Central to sociocultural theory is the concept of cognitive apprenticeship, which is "an approach to instruction in which students works with an expert to learn both how to perform cognitive tasks and why they perform certain tasks in certain ways" (Lave, 1990 in Eggen & Kauchack, 2006). This concept generally indicated that complex learning tasks are mastered by students working with someone who is already good at the tasks. Students work together to solve problems in learning communities. As with John Dewey's Pragmatism, sociocultural theory also points out authentic environment as the learning context. Through authentic activities, students develop their cognitive skills and motivation that enable them to function as a community (Hall, 2007). Social interaction is an essential component of the process, and the students are involved in cognitive apprenticeships as the teacher guides their efforts, which is in accordance with problem-based learning.

The Problem Solving Model

Problem Based Learning (PBL) follows a simple cycle. The teacher must ensure that students know the stages of the problem-based learning to ensure effective learning takes place. Figure 1 below shown problem-solving model as outlined by Eggen & Kauchack (2006).
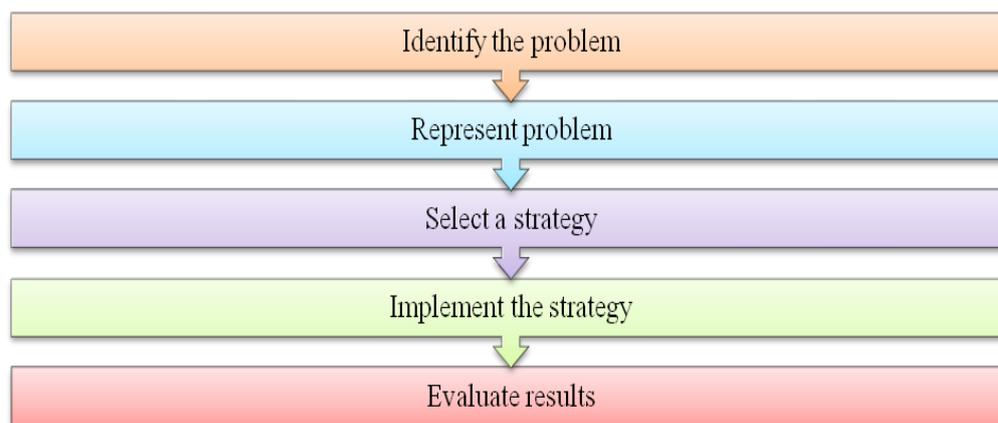
Figure 1: Problem-Solving Model

Problem-based learning process begins with the students identifying the problem, which is intended to draw students' attention towards the lesson and present them with a sense of challenge. The second phase of the process is intended to activate their background knowledge by using mind maps, list of what is known or what is unknown or analogies in order to represent the problem. By doing so, it assists students in linking the conceptual gap between defining the actual problem and selecting the best strategy. The third phase of the process involves selecting appropriate strategies to solve the problem. It is imperative to note that at this point students are more likely to select the first strategy that comes to mind and thus disregard the alternatives. Therefore, teachers can encourage students to be more reflective at this stage of problem solving. After selecting the best strategy, students implement the strategy and evaluate the results. In the final phase, students examine the validity of their solutions.

Cooperative Learning

Apart from problem-based learning, another important component of reform in teaching and learning is to change the traditional instruction into cooperative learning. In the traditional classroom, students assume the role of passive learners and recipients of the educational content transmitted by the teacher. The traditional lecture method is largely teacher-centered, with the teacher act as the sole information giver in the classroom. Learning assessments also greatly depends on their individual tasks such as quizzes, examinations and tests, which indicate that students have little in-class interaction during the learning process.

On the other hand, the cooperative learning model is an instructional strategy that involves students working collaboratively in small learning groups to complete a task given by the teacher (Johnson & Johnson, 1986; Johnson, Johnson & Smith, 1991; Slavin, 1983 in Neo, 2005). Cooperative learning is developed as an attempt to increase learner involvement in classroom activities by working together on academic tasks. Numerous research also has indicated cooperative learning can develop students' social interaction skills, inculcate leadership skills and decision-making experiences, and present them with the opportunity to interact and work together with peers from different cultural and socioeconomic backgrounds (Eggen & Kauchack, 2006). In addition, this pedagogy approach also enhances students' interpersonal competencies such as "oral communication, group leadership, active learning, the ability to examine assumptions, and the ability to tolerate ambiguities". (Tribe, 1994 in Neo, 2005).

A study carried out by Mohammed Abu Hasheesh et al (2011), found that students' motivation and achievement are significantly improved when they are engaged in cooperative learning as compared to the traditional method of teaching. The study indicates that by exchanging and comparing their ideas within the learning situations, students become highly engaged in their own learning, and thus, improve their academic performance. This finding is consistent with previous research conducted by McMaster & Fuchs (2002), which shows positive effects of cooperative learning on the academic achievements of students with learning disabilities.

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In the mean time, Yamarik (2007) examines the effects of cooperative learning in improving students learning outcomes by applying cooperative learning to one lesson and taught another lesson using a traditional lecture format. From multivariate regression analysis, the data indicated that students in cooperative learning groups achieved greater academic performance based on their examination scores. Apart from that, Johnsen (2009) investigates the effects of cooperative learning strategy in improving students' attitude towards mathematics and he discovered that there is an improvement in students' attitude towards the subject after working in groups. The study also highlights the importance of teaching the students how to work cooperatively together in a group because some students might face difficulty contributing to a group atmosphere. Based from literature review cited above, this calls for paradigm shift from lecture method to active learning strategies that focus on effective teaching and promote creative and critical thinking among the students.

Theoretical Foundations of Cooperative Learning

Interest in the role of social interaction as an instructional tool derived from a Russian psychologist, Lev Vygotsky (1896-1934). In his work, Social Development Theory, Vygotsky emphasized the role of social interaction in student learning. It is through social interaction and language, embedded within a cultural context, that students learn from each other. Therefore, social interaction is fundamental in a cognitive development process. Fogarty (1999) stated, "Vygotsky's theory suggests that we learn first through person-to-person interactions and then individually through an internalization process that leads to deep understanding" (p. 77) cited in Blake & Pope (2008). Thus, according to Vygotsky, the essence of learning is social interaction, a concept that is first presented to a child either by their parent, teacher, or peer, and from the interaction learners gain understanding from the process of internalization. Due to this reason, educators need to create conducive learning environment that can enhance social interaction among the students.

In addition, central to this theory is Zone of Proximal Development (ZPD), which uses social interaction with more competent others to move development forward. He proposed that knowledge is constructed as more knowledgeable others interact with and share their expertise with others. Vygotsky defined this zone as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86 in Bunce, 2003). In other words, Vygotsky's concept of the zone of proximal development is based on the notion that development is established by what the learners are able to do on their own (the actual development) as well as by what they can do with the help of their teacher or more skilled peers (the proximal development).

Slavin (2005) asserts that these levels indicate where is the child is at the current moment and where the child is progressing. Therefore, knowing both levels of Vygotsky's zone is useful for teachers as it can help teachers to plan learning activities that encompass what the learners are able to do independently and also what they can achieve when assisted by others. Besides, teachers can assign students with different abilities in cooperative learning groups so they can help each other. These theories of social learning and zone of proximal development suggest the significant of social interaction in developing cognitive skills of the students. Cooperative learning provides learning environment that can foster social interaction through sharing and exchanging ideas among the students.

In addition, Slavin (1995) has developed a model of how cooperative learning might improve learning, as shown in Figure 2 below.
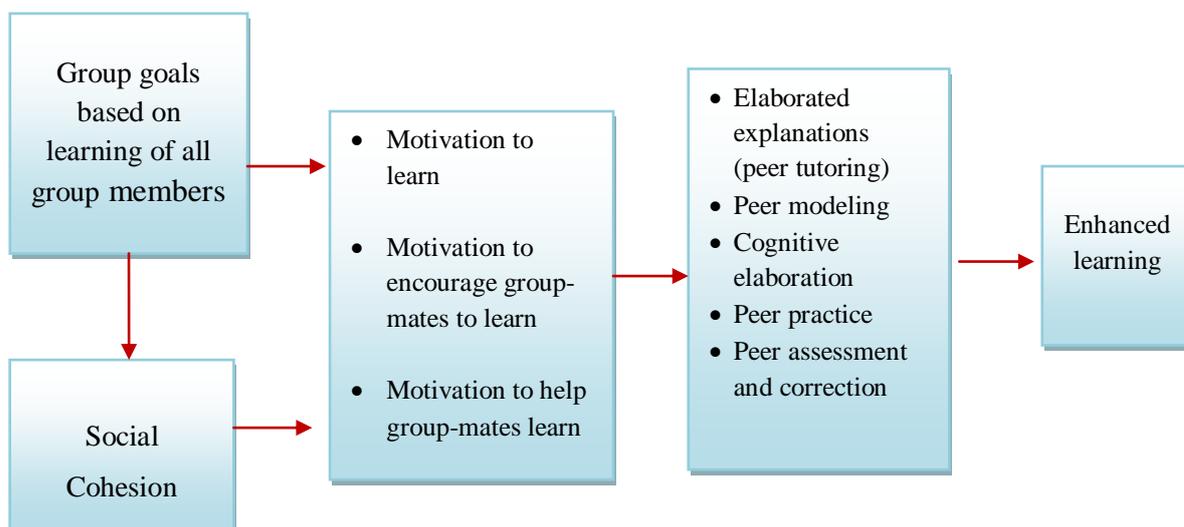
Figure 2: How Cooperative Learning Improves Learning (Slavin, 1995).

Figure 2 depicts the fundamental aspects of group learning interaction and the relationships among the different theoretical approaches. This model of how cooperative learning can improve learning advocates that the goals of the group of all group members are vital in ensuring the effectiveness of the cooperative learning. Slavin believes that motivation to learn and to encourage and help others to do so stimulate cooperative behaviours that lead to better learning among the students. Moreover, cooperative behaviours will result in group cohesion, which in turn facilitates the dynamics of group interactions such as peer tutoring and modelling, cognitive elaboration, peer practice, and peer assessment and correction that generate better learning and academic achievement (Slavin, 2005).

There are several cooperative learning models that have been extensively developed and researched where teachers can apply in the classroom. One of them is Student Teams Achievement Divisions (STAD), by Robert Slavin (1994) which is designed to teach facts, concepts and skills. Slavin (1990) identifies five fundamental components of STAD namely; class presentations, teams, quizzes, individual improvement scores, and team recognition (Van Wyk, 2010). In STAD, students are assigned in small groups, preferably four members, with varied performance level, sex and ethnicity. In implementing this model, first, the teacher introduces and explains the content, and then students are involved within their groups to master the lesson. As students work in their groups, teacher monitors and guides their work to ensure they are functioning smoothly. Eggen & Kauchack (2006), highlights the risk of early intervention from the teacher. Teacher needs to be careful about intervening too soon as it may be counterproductive because students often need more time and freedom to work through problems. However, if crisis arises among the group members, for instance one is dominating a group, or someone is not contributing, intervention is deemed necessary. In addition, interventions that focus on positive practice can help students understand different roles in the groups and thus, foster productive and effective cooperative learning.

Finally, to assess students' learning, students are required to take individual quizzes on the lesson. At this point, they are not allowed to help one another. In order to evaluate students' achievement, their quiz scores are compared to their previous grades, and points are awarded if there is any improvement. The points of each group members are summed to form team scores, and awards are given to teams that achieve certain criteria. Team awards can be in a variety of forms, but teachers should decide on what will be the most motivating to the students. According to Eggen & Kauchack (2006), assessment serves at least two functions in the STAD model. First, it provides both the teacher and students with feedback about learning progress, and second, it can provide incentives for students' work and effort. Slavin (2005) asserts that the whole cycle of STAD activities generally takes three to five class periods.

Numerous studies of STAD have found positive effects of the model on students' learning outcomes. For instance, a recent study carried out by Tuilan, Liando & Maru (2013), found that the implementation of STAD as a cooperative learning method increases students' learning outcomes in grammar class and helps all students passed the standard score. Based from the data analysis, the number of the students that passed the standard score in cycle 1 is higher than the pre-test, and the number of students who passed in cycle II is significantly higher than cycle 1. Apart from that, Van Wyk (2010), conducted a study to investigate the impact of STAD as a cooperative teaching and learning technique on the performances of students. Results showed that the experimental group, which experienced STAD, had a statistically significant increased in economic literacy levels, with 16.13 score increased from the pretest and posttest compared to the control group. In addition, Van Wyk (2012) carried out another study on the effects of STAD on students' achievement, attitude and motivation in economics education. The study employed three research instruments namely; Test of Economics Literacy (TEL), a Motivation Scale, and an Economics Modular Test. Based on the analysis, it was revealed that STAD promoted positive attitudes among the students and increased academic achievements and students' motivation to learn in economics education.

Another recent study conducted by Tran (2013), also indicated similar findings from the previous research. In his study, Tran (2013) explored the effects of STAD on academic achievement and attitudes of grade 9th secondary school students in Vietnam towards mathematics and it was found that cooperative learning was effective in improving academic achievement as well as in fostering positive attitude toward mathematics. The literature review cited above repeatedly suggest the positive impact of cooperative learning approach in improving students' learning and their academic achievements. Their motivation toward learning was also reported to be significantly higher than before. Therefore, teacher should incorporate Student Teams Achievement Divisions (STAD) as a cooperative learning method in teaching and learning process for better learning outcomes.

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Conclusion

In conclusion, pedagogy approaches and teaching strategies that are practiced in the old curriculum is undeniably more towards teacher-centered and lecture method. Hence, teaching and learning process is regarded as a passive and mundane one-way style which limits student's intellectual development. According to the School Inspectorate report (2006) in Mohd Najib et al (2011), 48% of teachers monitored still use the "chalk and talk" method in the classroom and sadly, the finding indicates that most teachers prefer using the conventional lecture method in delivering the lesson. In spite of this, traditional teaching methods that have been used for decades have proven to be inadequate in providing holistic education and it fails to provide practical and meaningful insight for students (Novcic et al, 2012). Due to this reason, there is a need to transform the traditional instruction of lecture-based course to innovative pedagogy approaches to increase the efficiency and effectiveness of learning through instructional process. Problem based learning and cooperative learning are the examples of two innovative teaching strategies that focus on infusing curiosity and a sense of challenge to the students as well as promoting creative and critical thinking, deep understanding, and meaningful learning, and thus, contribute to improving the quality of education.

Teachers are urged to be creative and innovative in teaching as it can encourage students to participate in the class and be more engaged in their own learning process. In order to enhance students' motivation and interest in the lesson, teachers can employ a wide variety of materials and methods of teaching to cater to the diverse learning styles and capabilities among the students. Various studies on students' learning styles have demonstrated preference for a variety of learning styles namely auditory, visual, tactile, and kinesthetic. Therefore, teachers are obliged to address a variety of learning styles in their lesson plan in order to maximize students' learning. This is further supported by Dunn (1996) in her study that shows teachers who teach different learning styles obtain positive results from their students. The findings illustrated that students from Grades 3-12 have gone from D's and F's to A's after the teachers adapted to learning styles as preferred by the students. Thus, teachers should be attentive of different learning styles among the students. Apart from that, various innovative approaches can be utilized which integrate the

use of ICT in the lesson to bring the outside world into the classroom. Teachers can also obtain teaching aids from texts, audio, and visual sources to make the lesson more appealing to the students.

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