

Title: A New Pedagogical Model Catalyzing 21st Century Skills to Facilitate Professional Development on ODL Platforms

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Introduction

At present the National Open School of Trinidad and Tobago (NOSTT) continues to operate many centres in several parts of Trinidad and Tobago. From 2010, however, its place as an independent Department of the Ministry of Education (MOE) has been threaten and by 2012 it was placed under the duties and responsibilities of another department, The Curriculum Department. From its inauguration in 2007, the author has been a part of NOSTT in two different sections – first as a Mentor/tutor of Mathematics and afterwards as a Learner Support Officer for central schools in Trinidad. During the summer vacation of each year, NOSTT commences a new cycle of registration for new learners in all its centres. Teachers are identified by the Centre Coordinator based on the courses to be offered at that particular centre. The teachers who will be given the mantle to facilitate in the NOSTT programmed are given some training in terms of Open and Distance Learning (ODL) teaching and learning modalities and what NOSTT's philosophies, vision, mission and goals are and what NOSTT expects of them as facilitators to the different types of learners it attracts. Facilitating in an ODL environment is different from operating in a face-to-face classroom setting. The time allotted for implement training of new facilitators is a challenge for the Centre Coordinators and the administrators of NOSTT. It is because of this reason that using a pedagogical model to facilitate teacher training via a professional development structure and using an ODL platform was conceptualized. The training is expected to include the teaching modalities of wikis, blogs, and synchronous Skype interactions or alternative Web 2.0 resources. The main feature of the pedagogical model will be the inclusion of 21st century skills in the training. The topics to be infused will be communication skills, cooperative and collaborative learning, high-order thinking skills, self-efficacy and the integration of technology in teaching and learning. It is hoped that this paper will begin to assist in teacher training: catalyzing 21st century skills; and improving the quality of instruction of Open Schools to its clientele, firstly in Trinidad and Tobago and elsewhere where such training is required.

Background

The Ministry of Education's (MOE) website of Trinidad and Tobago states that NOSTT represents an educational system which uses a blend of conventional and distance education methods and allows learners to choose how to learn, when to learn, where to learn and what to learn using a wide range of educational media. It continues to say that it is complementary to the formal education system and play a vital role in providing people of all ages with learning opportunities that are diverse, flexible, accessible, inclusive, learner-focused and responsive. It facilitates those who may have missed out at an earlier stage or those who may simply wish to further their career goals or personal development by offering more diversified curricula.

In March 2008, at a Regional Meeting of Focal Point in Jamaica, the Director of NOSTT outlined accomplishments and plans of NOSTT till 2012. However, from 2010 to present, the independent administrative structure of NOSTT was transformed and the department placed under the Curriculum Department of the MOE. The activities of NOSTT have continued but the training of facilitators and its foundation vision, mission and goals have been discontinued or suspended. The following were included as new perspectives of NOSTT: to pursue collaborative activities that can build on synergies between the Preuniversity Programme (PUP) of the University of Trinidad and Tobago (UTT) and NOSTT; continue capacity building activities in the following areas: Course Writing; Computer Literacy Training; Continue the writing of self-study modules in 8 academic and 3 technical vocational areas (print format).

It is important that NOSTT as a department continue to train its facilitators and equip them with the tools and resources to posit them with the skills and competencies to perform their tasks as ODL practitioners. For the most parts NOSTT presently delivers a traditional teaching and learning methodology and has plans of revolutionizing this system from September 2010. It has now become necessary to have professional development sessions to furnish facilitators with the needed skills and competencies to perform their duties in an ODL environment.

21st Century Skills

Friedman (2007) and Wagner (2008) states that companies in the twenty-first century stipulate that employees be critical thinkers, effective collaborators, innovators, and excellent communicators. Bellanca & Brandt (2010) also agrees that twenty-first century companies, organizations and countries are interested in finding the most qualified human capital to contribute to the advancement of knowledge creation. Hence, there is a challenge for educators to transform how they prepare learners for the inevitable and impending workforce. In other words, educational institutions have to approve and permit the empowering of learners to obtain twenty-first century skills and knowledge to meet the demands of higher educational institutions, a knowledge-base economic workforce and the society in which they reside.

Spellings (2007) believe that meeting the challenge of a changing world by creating the support structures to infuse twenty-first century skills and guarantying that learners have practical problem solving skills is vital to deal with the demands of a changing world. Wagner (2008) further suggests that this separation between what schools are teaching and what students are learning, and what is required for dynamic societal involvement in a changing world has created a “global achievement gap”. In the end this is leaving graduates unprepared to live and function competently and easily in the twenty-first century.

The Partnership for 21st Century Skills is an organization founded in 2002 in collaboration with the U.S. Department of Education and various businesses, such as Microsoft and the National Education Association, to restructure classroom learning experiences by instructive means whereby students can be involved in collaborative inquiry and problem solving activities. They have become one of the preeminent leaders of twenty-first century skills education. They have outlined the following competencies as being twenty-first century compliant: information and communication skills (information and media literacy skills; communication skills); thinking and problem-solving (critical thinking and systems thinking; problem identification, formulation and solution; creativity and intellectual curiosity); interpersonal and self-direction skills (interpersonal and collaborative skills; self-direction; accountability and adaptability; social responsibility); global awareness; financial, economic and business literacy, and developing entrepreneurial skills to enhance workplace productivity and career options; and civic literacy (Partnership for 21st Century Skills, 2004).

High-order Thinking Skills

The ability to reason at higher levels is accepted and considered as a major instructional goal of education and is regarded as a motivating force behind efforts to reform education over the past two decades (Costa, 2001). However, teaching using higher-order thinking (HOT) is complicated and difficult (Ravitch, 2010).

In general, thinking skills is opposed to precise forms of definitions, but as Marzano et al. (1988) illustrated, LOT and HOT can be identified when each occurs in practice. It is therefore necessary to differentiate between LOT and HOT. LOT is often categorized as the remembering of information or the application of concepts or knowledge to well-known and familiar situations and concepts. LOT can be characterized as solving tasks where the solution requires applying a well-known algorithm, often with the student having no justification, explanation, or proof required, and where normally only a single correct answer may be meant to be possible. In contrast, HOT requires subtle judgment and is non-algorithmic which means that the solution is not known or specified beforehand. Thus, HOT is used when complex, non-algorithmic thinking to solve a task in which there is not a predictable, well-rehearsed approach or pathway explicitly suggested by the task, assigned instruction, or a worked out example.

Self-efficacy

Self-efficacy is an important concept in social cognitive theory, which has been widely recognized as one of the most prominent theory about human learning. First developed by Albert Bandura (1993), self-efficacy refers to learners' beliefs about their ability to accomplish certain tasks. Many researchers, including Bandura, have demonstrated that self-efficacy affects human motivation, persistence, efforts, action, behaviour, and achievement.

Due to the fact that there are subtle differences between self-efficacy and attitude, it is important to distinguish between these two terms. As stated above, self-efficacy is a person's self-confidence about their ability to accomplish a task. Attitude is a person's feelings about a task, such as whether or not they believe the task is important, enjoyable, or difficult. Students with a positive attitude may believe that doing well is important. Even though they may believe that they cannot do mathematics, for example, it is important they may not believe within themselves that they can solve a math problem. It follows then that a student with a positive attitude may have a low self-efficacy. Quite the reverse, if they believe that mathematics is important they may develop persistence toward any subject area and will subsequently develop higher self-efficacy. It is therefore important that students as well as teachers possess positive self-efficacy to accomplish the tasks they are called upon to accomplish.

Collaborative and Cooperative Learning

Interaction and dialogue are key components of learning according to social learning theory (Bandura, 1993). Social constructivism emphasizes the conciliation of meaning and construction of shared understanding through dialogue. Vygotsky's (1978) view learning as a social process that occurs within the zone of proximal development (ZPD) also position's interaction as crucial to the development of thought and behaviour. The cooperative and collaborative approach to learning provides and enables a framework for social learning as depicted by Bandura and Vygotsky.

Slavin (1995) defines cooperative learning as an instructional method whereby students carried out as a team, in small groups of two or more individuals, with specific common learning goals and objectives. All of the members of a group are expected to be actively committed to working mutually to achieve the established objectives in order for the activities to be called cooperative learning. Cooperative learning encourages the use of higher reasoning strategies and greater thinking capabilities as students participate and work as a team. Thus a corollary of collaborative and cooperative learning is communication and teamwork; which are essential tenants of 21st century skills. It is possible to have collaboration and cooperative learning using online learning

Technology Integration

Technology is an ever-progressing component of our global society and has become ubiquitous in classrooms as a learning resource. Studies on the effects of integrating technology in teaching have begun to provide evidence on students' achievement. Simplico (2002) believes that this should gain the attention of teachers to transform their teaching methodologies as it is a major ingredient in the lives of youths all over the world.

Learning and teaching higher-order concepts and skills are main goals of newly developed performance based instruction. Memorizing facts is no longer the most effective approach to learn. Making connections from the classroom to the real world is more of what teaching today encapsulates. The infusion of technology can assist in bridging this gap.

Technology provides students with the opportunity to simulate different complex scenarios, processes and phenomenon, to generate visualizations and explorations, and to connect dynamic notations, linked representations, and operations with symbols. Therefore, integrating technology in an ODL setting should not be simplistically perceived as using computers; rather it is a tool for mind, representation and modeling.

Theoretical Framework

The constructivist theories stand out clearly as the most suitable to examine the infusion of twenty-first century skills simultaneously with content of any subject area, such as mathematics and science. The cognitive learning theory and the social learning theory of constructivism and how its well known proponents, Piaget, Vygotsky, Papert, Bruner, and Ausubel demonstrates its importance in the process of learning will be used as the foundation for the proposed pedagogical model. Teachers and learners will therefore be guided via active, collaborative and cooperative measures and strategies to accomplish high-order thinking, self-efficacy, technology competencies, and communication skills, through real-world problem solving tasks, in the form projects, to attain the skills related to twenty-first century skills and competencies.

The dynamic workforce that awaits today's graduates of secondary schools and universities demands competencies in mathematical understanding (Moore, 2005). This means that skills for analyzing and solving problems, communication skills, and the ability to work on flexible and cooperative teams become major competencies. Studies have continued to demonstrate that using constructivism increases achievement, intrinsic motivation, and self-efficacy (Bandura, 1993; Brooks & Brooks, 1993; Fosnot, 1996; Olson, 1999).

It follows therefore, that the theoretical framework, Active Collaborative Cognitive and Social Learning (A3CSL), of the pedagogical model of this paper, which is the conjectural representation of how one posit the relationships of the various issues is shown in Figure 1.1

Active Collaborative Cooperative Cognitive and Social Learning – A3CSL Model

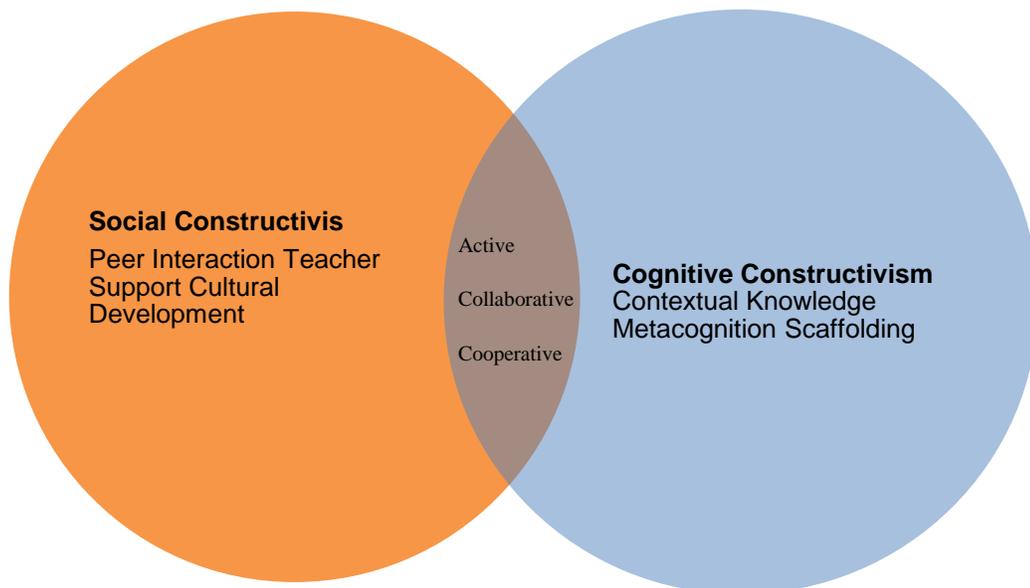


Figure 1.1: A3CSL Model – Active Collaborative Cooperative Cognitive and Social Learning

Conceptual Framework

A conceptual model for the infusion of twenty-first century skills using a new pedagogical model is thus proposed as in Figure 1.2

A Pedagogical Model using Professional-development to Train Teachers in Odl Strategies – PMP2TOS

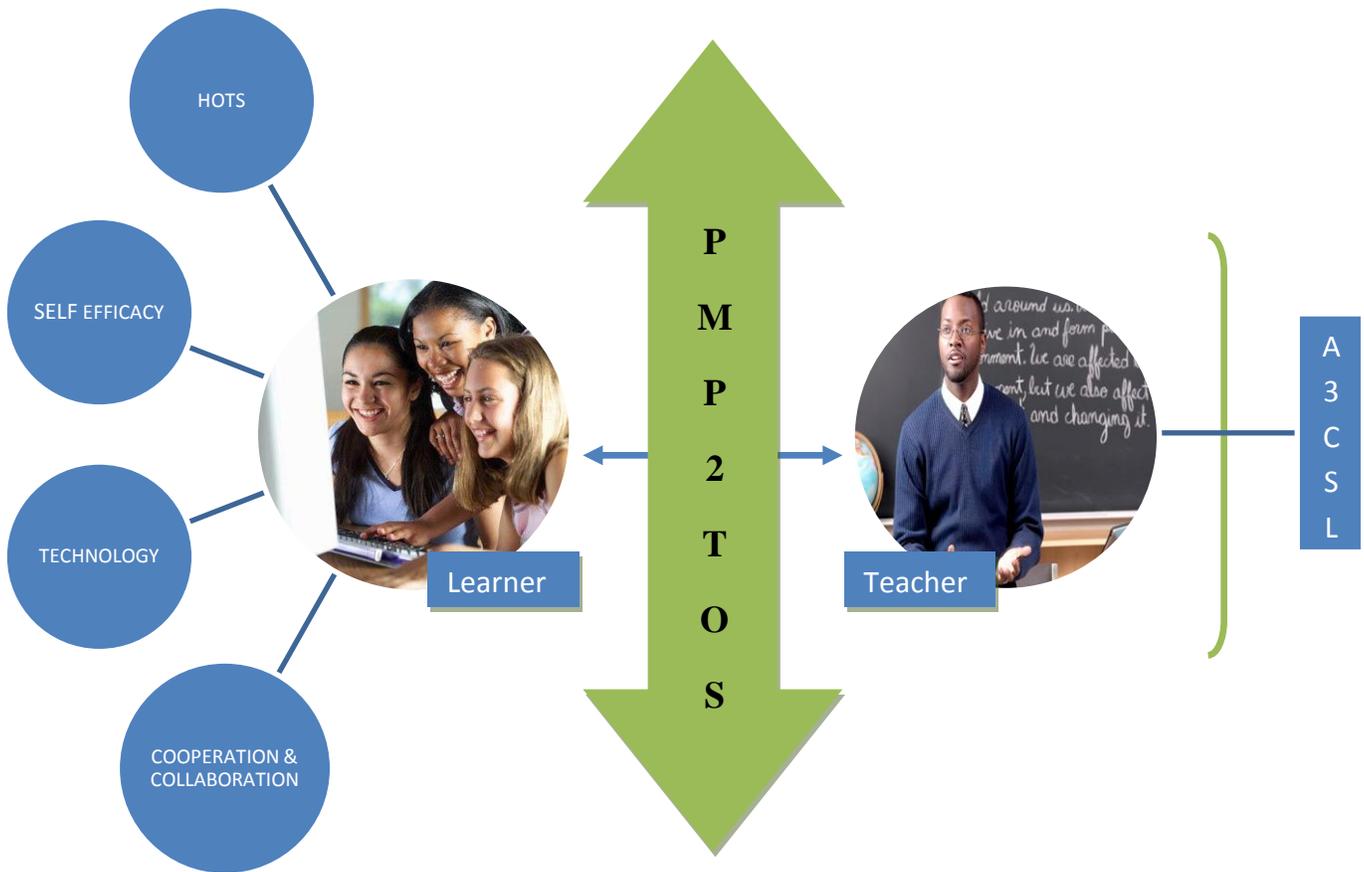


Figure 1.2: PMP2TOS (A Pedagogical Model using Professional-development to Train Teachers in Odl Strategies)

The conceptual model, A Pedagogical Model using Professional-development to Train Teachers on Odl Strategies (PMP2TOS), caters for the needs of learning twenty-first century skills for NOSTT facilitators. This is based on the theoretical constructs of past and contemporary constructivist learning environments. The major principles of the conceptual framework hinges on the teacher being a facilitator trained in being able to support students in gaining the confidence (self-efficacy) to believe that they can solve problems; understanding and implementing high-order thinking skills so that learners can be critical and innovative thinkers; able to use cooperative and collaborative strategies in that learners can through real-world

applications and projects gain a better understanding and meaning of the subject being taught; and using technology to communicate and assist learners in achieving the required objectives.

In PMP2TOS, the teacher (as facilitator) undergoes a training period to be equipped with the skills to function at executing the new roles to be twenty-first century skills compliant and competent. The strategies and methodologies of cooperative and collaborative learning will be given in order that the teacher understands that group work is not just placing students into groups. High-order thinking skills will be discussed and the differences between high and low order questions will be verified. The use of technology will be viewed in the context of demonstrating that its inclusion will assist students learning and understanding. Self-efficacy as a topic to be viewed to assist with how students see themselves progressing and will also be discussed and dealt with in the training sessions. After the teachers have been trained and have the skills and competencies needed to implement PMP2TOS, this will be transferred to the online learning classroom in the teaching of the different topics

Development of PMP2TOS

The conceptual model, PMP2TOS, for an ODL constructivist learning environment, was developed to provide the requirements of providing professional development training for infusing twenty-first century skills for NOSTT facilitators. The foundation of PMP2TOS pivots on the theoretical constructs of past and contemporary constructivist learning environments. The major principles of PMP2TOS hinges on the teacher being a facilitator who is trained in being able to support students in gaining the confidence (self-efficacy) to believe that they can solve problems related to any discipline; understanding and implementing high-order thinking skills so that learners can be critical and innovative thinkers; able to use cooperative and collaborative strategies in that learners can through real-world applications and projects understand the meaning of mathematics; and using technology to communicate and assist learners in achieving the objectives in ODL instructions. In PMP2TOS, the teacher (as facilitator) undergoes training in order to be equipped with the skills and confidence to function at executing the new roles to be twenty-first century skills compliant and competent.

Thus, PMP2TOS was developed in order that facilitators and learners interact in an active learning environment where content and skills are learned and developed respectively; and where learning has new meaning.

Implementation of PMP2TOS

PMP2TOS will be implemented using a blended approach using the MOODLE platform. Primarily the training will be done online; this will be appropriate for the facilitators as they will be expected to not only use MOODLE but to provide some teaching/learning sessions to learners during the performance of their duties as Mentor/Tutor.

The use of wikis, blogs and synchronous software (such as Skype) will be employed to demonstrate how learners can be connected. One of the problem of NOSTT is keeping their learners connected and thus be a part of the programmed. The possibility of mobile learning will also be exploited as a resource to enable facilitators to reach learners wherever they are and by any technological means possible. It is therefore apt to say that PMP2TOS will be facilitated during the summer vacation from once internet connectivity is available. There will be the option to re-trained facilitators. Finally, because most of the training is done online, facilitators will have the opportunity to share continuously, ask questions and receive answers at anytime, and learn at their own pace.

Conclusion

In many countries of our global village, leaders and ministries of education are struggling with creating learning curricula, instructional strategies and learning environments that will serve the needs of the 21st century. Given the rapid regularity of change in a technologically-driven world, life will be very different for our learners when they graduate from any academic institution and enter the world of work. Our current

educational system is not adequately preparing our learners for the kinds of jobs and lives they are likely to encounter in their lifetime (Friedman, 2007). Learning institutions must therefore work to prepare learning environments to infuse learners with priceless and indispensable 21st century skills. PMP2TOS will assist ODL training in institutions such as NOSTT to endow their learners with 21st century skills and competencies.

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