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**TEACHING HIGHER ORDER THINKING SKILLS IN MEDICAL
ASSISTANT EDUCATION: AN EVALUATION OF
CURRICULUM MANAGEMENT AND
DEVELOPMENT**

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**DISSERTATION SUMMITTED TO FULFILL
THE REQUIREMENT TO OBTAIN
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AND MANAGEMENT)**

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DECLARATION

I hereby declare that the work in this dissertation is my own except for quotations and summaries which have been duly acknowledged

12.09.2009

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ABSTRACT

This case study research aims at giving a description of whether the written curriculum and the operational curriculum provides scope and opportunity for the development of higher order thinking skills among students enrolled in Medical Assistant Training Program. The study proceeds with an evaluation of curriculum coherence between the written and operational curriculum on the infusion of higher order thinking skills by using Stake Countenance Model. The nature of problem evolves around the inability of fresh graduates to function in real life situations that leads to questioning the effectiveness of the training model which presents a gap between the learnt and written curriculum. The study explores the curriculum's content for the infusion of higher order thinking skills, whilst lecturers' understanding, planning and delivery of higher order thinking skills is done through interview, content analysis of the instructional plan and observation of classroom activities. Students' performance at the level of higher order of thinking is gauged through content analysis of answer scripts of their summative examination.

The study reveals that the written curriculum caters for the development of higher order thinking skills in Medical Assistant education, but this was not reflected in the operational curriculum. While, some structural dispositions like compact content, time limitations on content coverage, hierarchical form of cognitive arrangement from lower order to higher order thinking, and assessment which places emphasis on lower order thinking skills was noted in the written curriculum which affects the development of higher order of thinking; this is further compounded by lecturers' belief system, pedagogical literacy and approach towards teaching of thinking, and utilization of teacher-centered approach which deters the development of thinking in Medical Assistant education. There is a need for collaborative effort between curriculum planners and lecturers to realign the written and operational curriculum in providing learning experiences which will enhance the development of higher order thinking skills. This involves curriculum mapping and reorganizing of content, shifting learning focus from teacher-centered approach to learner-centered practice in promoting active academic engagement and early infusion of higher order thinking skills in the training program. Together with this, the assessment techniques and tools should facilitate the development of higher order thinking skills through reorganizing the Assessment Specification Schedule which need to focus on a range of higher order of taxonomy in ensuring learners are developed and tested at higher order of thinking. In addition, there is a need for embracing continuous development of pedagogical literacy in teaching thinking skills with the fusion of content mastery among teaching personnel which will enhance the development of higher order thinking skills in the teaching and learning process. Future studies need to further explore the area of infusing higher order thinking skills in clinical practice and the ability of students to bridge theory and practice in clinical settings which will ensure that the product delivered meets the educational goals.





ABSTRAK

Kajian kes ini bertujuan memberi penjelasan mengenai adakah kurikulum bertulis dan kurikulum operasi memberi ruang dan peluang bagi perkembangan kemahiran berfikir aras tinggi dikalangan pelajar yang mengikuti program latihan Pembantu Perubatan. Kajian ini berfokuskan kepada penilaian koheren kurikulum diantara kurikulum bertulis dengan kurikulum operasi berhubung infusi kemahiran berfikir aras tinggi dengan menggunakan '*Stake Countenance Model*'. Masalah kajian berkembang daripada isu kegagalan graduan untuk berfungsi dalam situasi kerja sebenar yang membawa kepada persoalan keberkesanan model latihan yang mempamirkan jurang diantara apa yang dipelajari dengan kurikulum bertulis. Kajian ini melibatkan analisis kurikulum Pembantu Perubatan bagi menentukan tahap infusi kemahiran berfikir aras tinggi; manakala kefahaman dan persepsi pengajar terhadap konsep kemahiran berfikir aras tinggi serta perancangan dan penyampaian kemahiran berfikir aras tinggi dilaksanakan melalui temuramah dengan pengajar, analisis dokumen pelan pengajaran, dan pemerhatian aktiviti pengajaran dan pembelajaran di bilik kuliah. Disamping itu, prestasi pelajar dikaji melalui analisis dokumen skrip jawapan pelajar.

Hasil kajian menunjukkan bahawa kurikulum bertulis ada menyediakan ruang dan peluang bagi perkembangan kemahiran berfikir aras tinggi, tetapi perkembangan ini tidak dicerminkan dalam kurikulum operasi. Sedangkan, struktur kurikulum bertulis menggambarkan ciri-ciri kurikulum yang padat, kesuntukan masa dengan liputan yang luas, susunan kognitif berhieraki daripada pemikiran aras rendah kepada pemikiran aras tinggi, dan format penilaian yang berfokuskan kepada kemahiran berfikir aras rendah, kurang membantu dalam perkembangan kemahiran berfikir aras tinggi; ianya dikukuhkan dengan sistem kepercayaan pengajar, literasi pedagogi dan pendekatan pengajaran kemahiran berfikir, dan penggunaan pendekatan '*teacher-centered*' yang menghalang perkembangan kemahiran berfikir aras tinggi dalam pendidikan. Keperluan kolaborasi diantara pemimpin kurikulum dengan tenaga pengajar untuk mengkaji dan menstruktur semula kurikulum bertulis dan kurikulum operasi serta menyusun dan menyediakan pengalaman pembelajaran akan pemantapan perkembangan kemahiran berfikir aras tinggi. Ia melibatkan pemetaan kurikulum dan penstrukturan semula kandungan kurikulum, anjakan fokus pembelajaran daripada '*teacher-centered*' kepada '*student-centered*' dan penekanan kepada infusi awalan kemahiran berfikir aras tinggi dalam program latihan. Teknik dan instrumen pengukuran dan penilaian perlu mencerminkan perkembangan kemahiran berfikir aras tinggi dan dibangunkan melalui Jadual Spesifikasi Ujian yang mempamirkan taxonomi kemahiran berfikir aras tinggi bagi membolehkan pelatih dibangunkan dan dinilai pada peringkat kemahiran berfikir aras tinggi. Disamping itu, keperluan untuk memupuk pembangunan berterusan literasi pedagogi dalam pengajaran kemahiran berfikir dengan masteri konten dikalangan pengajar dapat memantapkan perkembangan kemahiran berfikir aras tinggi dalam proses pengajaran dan pembelajaran. Kajian ini perlu diperkembangkan kepada explorasi infusi kemahiran berfikir aras tinggi dalam praktis klinikal dan keupayaan pelajar untuk menghubungkan teori dengan praktis dalam kawasan kinikal yang akan memastikan produk yang dihasilkan memenuhi kehendak matlamat pendidikan.



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CHAPTER 1

INTRODUCTION

1.1 Introduction

The terminology ‘thinking’ had long been in existence since the time of Socrates teaching to the era of contemporary psychologist. Human being’s attempt to think speculatively, reflectively and systematically have enabled human life to adapt and adopt to changes and challenges for the survival of mankind. The need for thinking skills in today’s personal, social, economical, and political environment is relevant to foster the development of human life that is full of possibilities (Brookfield, 1987; Kamisah Osman et al., 2009). Teaching of thinking skills in the educational process not only prepare individuals to interact meaningfully and capitalize their potentials in problem solving and decision making, it also enhances academic performance and as well as promote intellectual growth (Meece et al., 2003; Pasnak et al., 2008; Rajendran, 2008). The degree of cognitive development and intellectual adaptation is influenced by the extent in which an individual had been natured and nurtured in the educational processes.

The importance of higher order thinking skills in the field of medical and nursing education, especially component of critical thinking and problem solving skills had been



underscored by numerous studies (Banning, 2008; Bridger, 2007; Salvage, 1993; Wong, 2005). Changing modality of health care practice, particularly in addressing the concept of quality in health, requires a new way of thinking, a different approach to professional work, and an expanded role in health care provision. Health care providers and practitioners were required to critically appraise evidence and make clear clinical judgments in the prevention and management of diseases, and the promotion of health (Ismail Merican, Rohaizat Yon & Ranjit Kaur, 2007). According to Pogrow (2005) higher order thinking skills develop confidence, open-mindedness, flexibility, inquisitiveness, intellectual integrity and reflection while, in clinical management of patients, higher order thinking skills fosters effective clinical problem solving and decision making skills (Banning, 2008; Bridger, 2007; Edwards, 2004).

In addition, the society's expectation on graduates to perform efficiently and confidently is becoming more and more evident over recent years. Era of consumerism fueled by advancements in medical knowledge and technology are driving changes in the expectation of society and clients demanding towards an equitable and quality health care. With the incoming notion of health as a commodity and the country capitalizing on health tourism (Ismail Merican, 2009; Rohaizat Yon, 2007) has been a driving force for knowledge economy. In earlier statement, the Malaysian premier, Abdullah Ahmad Badawi (2004) pointed out that the nation requires human capital who will be able to adapt and adopt to globalize challenges, being highly skilled, productive and competitive to render excellent services. Learners were required to be equipped with relevant knowledge, skills and capabilities designed to help them anticipate change and plan accordingly to thrive in a world characterized by rapid changes and challenges, and in the provision of professional services. These changes required the infusion of thinking skills in the educational processes to develop individuals with knowledge, problem solving skills, cognitive processes, and intellectual dispositions to develop individuals who can be self initiating, self modifying

and self directing. As such, the infusion of higher order thinking skills in Medical Assistant's education is seen essential and relevant for the preparation of health care practitioners toward rendering safe and quality clinical practice.

1.2 Background of Study

The dawn of the 21st century has heralded changes in the society's view of health and diseases and consequent changes in society's expectation of health care services. Changing disease pattern and emerging modality of life style diseases have placed great demand on health care providers to seek new approaches and strategies in the promotion and prevention of diseases. Under the 9th Malaysian Plan, the primer focus of the health care delivery system was to strengthen its primary care; to prevent and reduce the burden of disease, improve access to health services, optimization of resources, strengthening of research activities, management of health information system and the development of human capital (Ismail Merican, Rohaizat Yon & Ranjit Kaur, 2007). The changing medical fraternity along the dimensions of technological changes, changing disease pattern and society's views of health and diseases, and expectation of the health care services has warranted demands on the role of Medical Assistant in the delivery of quality health services.

Medical Assistant forms part of the health care team in the delivery of health care services in Malaysia. They are envision to complement and supplement medical practitioners in the delivery of health care services through promotion of health, prevention of diseases, managing diseases, and rehabilitative services; functioning at the primary, secondary and tertiary level of care (KKM, 1988). Their wide spectrum of roles and responsibilities that involved history taking, listening to patient's complaints, asking questions, performing physical examination, performing tests, analyzing results, and making a determination as what the problem is and how it should be managed requires higher order

of thinking. The ability to engage in carefully, reflective thought that has been viewed in various dimensions and decisions of good choice requires effective thinking (Pogrow, 2005); and making the right decision in managing cases and taking into consideration of ethical issues concerning patient care require higher order thinking skills (Bridger, 2007; Vrahnos, 1998; Wong, 2005).

The Medical Assistant training program was designed to meet the function of Medical Assistant, aimed to produce graduates who will be able to utilize the acquired knowledge and skills in the delivery of quality health services. The training focused on the ability to identify health problems at every level of individuals, family and society and render solutions through promotive, preventive, curative and rehabilitative services in an effective and efficient manner. They are expected to function as team leader and team player in the health care teams; internalize religious values and social norms in the delivery of health care; deliver health education and patient education towards achieving health for all; and appreciate the importance of providing complete care towards the realization of Ministry of Health's and the country mission (KKM, 2008). The curriculum that places emphasis on producing a 'knowledgeable, competent and safe practitioners' highlights the need for the development of higher order thinking skills among students of Medical Assistant training program. Brady & Kennedy (2003) postulated that any curriculum that incorporates thinking skills, positive attributes of learning, inculcation of positive attitude and values, and in the making of skilled and productive human capital is deemed relevant to current times in meeting the challenges of the new millennium. The inclusion of higher order thinking skills in the medical assistant curriculum will not only enable graduates of this program to function efficiently and effectively in rendering quality health care services but also provide a pathway for continual learning. The question is how well does the medical assistant training program respond to the challenges of teaching higher order of thinking?

1.3 Statement of Problem

There was a general outcry by end users that graduates of paramedical training do not perform as expected in real life situations. A preliminary discussion on the performance of freshly graduated Medical Assistants revealed critics from stake holders and end users with regards to lack of confidence, poor thinking and reasoning skills among Medical Assistants. In addition, an unpublished report on student's performance in the summative examination have highlighted a lack in the higher order thinking skills and had questioned the effectiveness of the training model that presented a gap between learnt and intended learning outcomes (MOH, 2007). Performance of an individual is reflected by his ability in applying acquired knowledge and skills confidently and consistently in varying situations. A demonstration of confidence and competence, problem solving and decision making skills and logic reasoning are key components of academic excellence that reflect quality of education (Banning, 2008). Learning is a social construct that comprises many processes ranging from simple learning of facts and memorizing to a complex process of learning to think and finding interconnection and meanings. The educational processes should strive for the capability of adapting and adopting thinking paradigms in expanding the use of minds to look across discipline and across the knowledge aimed at providing cognitive nourishment, dexterity enhancement and affective formation that fosters understanding, strengthened judgment, improves reasoning, and imparts a clear sense of relevancy of inquiry to the enlargement of humanity. Lack of confidence, poor thinking and reasoning skills reflects an inadequate preparation of an individual to hold office in performing his role and responsibilities. A rehabilitation program of retraining incurs surge in the expenditure and proven unproductive.

Medical Assistant education is aimed at producing knowledgeable, competent and safe practitioners who will, with their wide repertoire of duties and responsibility, provide total commitment towards holistic health care and community oriented practice (KKM,

2008). They were expected to apply acquired knowledge and skills to investigate, examine, analyze, evaluate and plan promotive, preventive, curative or rehabilitative care in an effective and safer perspective. The ability of an individual to apply, analyze, interpret, draw conclusions, solve problems and make decision requires higher order thinking (Baron & Sternberg, 1987; Pogrow, 2005). As such, teaching of thinking and infusion of thinking skills in the curriculum was seen relevant in enhancing cognitive development and promotes intellectual growth of an individual.

Fostering higher order thinking skills in medical and nursing education have become more evident and been given importance over the years (Bridger, 2007; Vrahnos, 1998; Wong, 2005). Findings of this studies have led to the shift in the operational curriculum from factual delivery of 'static cold storage knowledge' (Rajendran, 2008) to the development of thinking through problem based learning, simulated learning and experiential learning. However, in Medical Assistant education, there has been hardly any study that addresses issue on higher order thinking. Questions on whether the written curriculum and operational curriculum provides scope and opportunity for the development of higher order thinking skills need to be explored. According to Posner (2004), a variation between the written curriculum and operational curriculum might produce the lag in the development of higher order thinking skills. Exploration of this factors using triangulation design would enable to rectify lags and congruence between the curriculum design and implementation process.

1.4 Statement of Purpose

The purpose of this study was to explore whether the written curriculum and the operational curriculum provided scope and opportunity for the development of higher order thinking skills among students enrolled in Medical Assistant Training Program.



1.5 Research questions

Two major research questions were explored, namely:

1.5.1 To what extent the written curriculum catered for the development of higher order thinking skills?

- a. Do the curriculum's philosophy, aim and objectives address the development of higher order thinking skills?
- b. Does the content coverage provide scope for the development of higher order thinking skills?
- c. Does the learning outcome address higher order thinking skills?

1.5.2 To what extent do the teaching learning process provided scope and opportunity for the development of higher order thinking skills?

- a. Does the instructional design development provide the learning experience in meeting the expected outcome?
- b. Does the delivery of the teaching learning process provide scope and opportunity for the development of higher order thinking skills?
- c. Does the assessment methods employed by the lecturers able to measure students' higher order thinking skills?

1.6 Significance of study

The findings of this study will provide a description on the level of inclusion of higher order thinking skills in the Medical Assistant Education and the need for the infusion of higher order thinking skills in the following areas of concern:



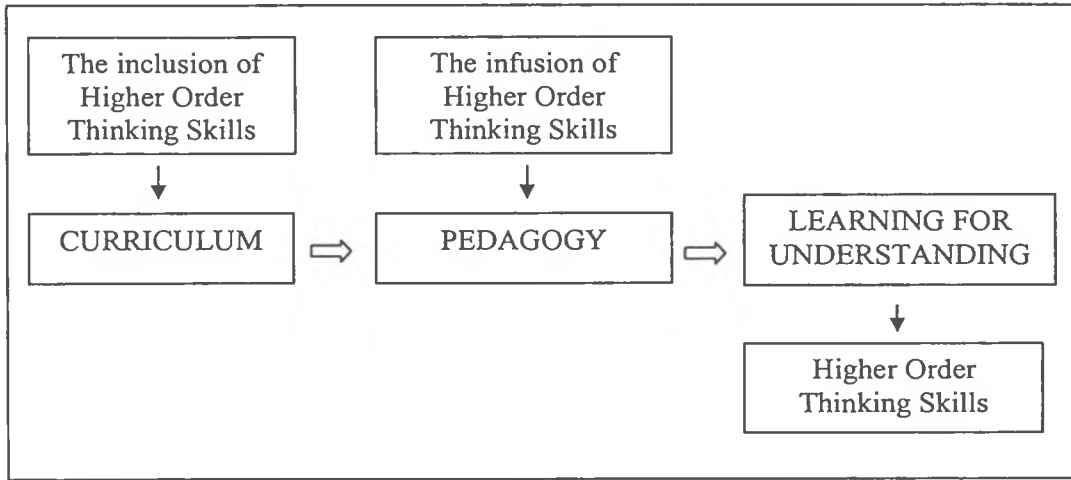
- 1.6.1 Provide a theoretical frame work for the infusion of higher order thinking skills in medical assistant education.
- 1.6.2 Assists curriculum managers and coordinators to realign or redesign the curriculum to include the infusion of higher order thinking skills.
- 1.6.3 Provide college administrators to better manage the implementation processes of the curriculum.
- 1.6.4 Assists the educators to understand the utilization of appropriate teaching and learning strategies towards the development of higher order thinking skills among students.

1.7 Theoretical and Conceptual Framework

The conceptual framework for this study was organized on the principles and assumptions that the written and operational curriculum will provide scope and avenue for development of higher order thinking skills. It is postulated that the inclusion of higher order thinking skills in the curriculum and the infusion of higher order thinking skills in the pedagogical process will bring about learning for understanding and hence, nurturing the development of higher order thinking skills among the learners. Bloom’s taxonomy (Bloom et al., 1956), is used to delineate cognitive activities at the level of application, analyzing, synthesizing and evaluating to gauge higher order of thinking. To support the conceptual framework, the theoretical framework of this study was developed based on evidence that there is a positive relationship between higher order thinking, education, and performance (Nickerson, 1987; Pasnak et al., 2008). This conceptual framework for teaching higher order thinking skills is reflected in Table 1.1.

Table 1.1

Conceptual framework for teaching higher order thinking skills



1.7.1 Higher order thinking skills

Higher order of thinking skills is defined as the ability to think about and articulate problems, inference from context, generalizing ideas and information from one context to another; and information synthesis (Baron & Sternberg, 1987; Pogrow, 2005). Higher order thinking involves combining of ideas and information to hypothesize, generalize, synthesize, explain and arrive at interpretations or conclusions that can lead to the discovery of new meanings.

Bloom et al. (1956) have classified cognitive domain into 6 classes namely knowledge, understanding, application, analysis, synthesis and evaluation (Refer Schedule 1.1). Higher order thinking skills involves level of application, analyzing, synthesizing and evaluating processes of the taxonomy. *Application* level involves applying previously learned information or knowledge to new and unfamiliar situations. It involves the ability to expand the use of mind to meet new challenges by putting knowledge and comprehension to work. *Analysis* involves breaking into components in order to make a clear understanding of how ideas are related and connected. Bloom noted that analysis deals with both forms and content. The form involves examining structures or principles, observing relationship of

logic and ability to break down elements into its component. The content component orders the components to distinguish between dominant and subordinate ideas; between evidence and hypothesis and sees assumptions with presuppositions. *Synthesis* focused on the ability to build ideas and other information together of that has been analyzed. Synthesis invokes the creativity to compose, invent or imagine, revise or transform, and present different ways of problem solving. *Evaluation* involves ability to connect evidence with conclusion to bring about judgment. The cognitive processing of higher order thinking occurs when a person takes new information and information stored in memory, and interrelates and rearranges and extends this information to achieve a purpose or find possible answers in perplexing situations.

1.7.2 Relationship between Higher Order Thinking and Education

The infusion of higher order thinking in education processes is becoming more and more evident in recent years. Positive correlation between higher order thinking and academic achievement has been well documented (Meece et al., 2003; Pasnak et al., 2008; Rajendran, 2008). Higher order thinking is teachable and learnable, and the impetus for incorporating thinking skills was the need to enable students to focus on 'knowing how' as well as 'knowing what' on learning how to learn. The concept of higher order thinking allows students to think meaningfully of issues and problems in real life situations and device strategy to encounter such problems effectively and efficiently through problem solving and critical thinking approach (Lewis & Smith, 1993; Nickerson, 1987). Curriculum that is responsive to the development of higher order thinking requires the arrangement of cognitive processes embedded in the body of learning, where learners are capable to create, utilize and apply learned experiences in solving problems and making decisions in real world situations (Baron & Sternberg, 1987; Fennimore & Tinzmann, 1990). Hence, the

educator's role involved developing a nurturing environment to build and structure experiences, participatory culture that foster active learning and sharing, and the development of new pedagogies that recognizes active learning as central to student development and in meeting educational goals.

1.7.3 Relationship between Higher Order Thinking and Medical Education

The importance of higher order thinking skills in medical and nursing education especially components of critical thinking and problem solving skills have been underscored by numerous studies (Bridger, 2007; Green, 2007; Salvage, 1993; Wong, 2005). Health care providers and practitioners were required to critically appraise evidence and make clear clinical judgments in the prevention and management of diseases, and the promotion of health. Higher order thinking skills not only develop confidence, open-mindedness, flexibility, inquisitiveness, intellectual integrity and reflection (Pogrow, 2005); it fosters effective clinical problem solving and decision making skills in the clinical management of patient (Banning, 2008; Bridger, 2007; Edwards, 2004). Nurturing cognitive abilities and enhancing clinical competencies involves engaging learners with active mental processes that stimulates organization of ideas, exploration of experiences, inductive and deductive reasoning in reaching a conclusion. Fostering higher order thinking skills in medical and nursing education focusing on teaching and learning strategies, and educational technologies have become more evident and been given importance (Bridger, 2007; Vrahnos, 1998; Wong, 2005). Findings of this studies have led to the shift in the operational curriculum from factual delivery to the development of problem based learning, simulated learning and experiential learning.

1.7.4 Relationship between Higher Order Thinking, Education and Performance

Thinking in education involves the capacity of the curriculum and pedagogy to bring about improvement of thinking that fosters understanding, strengthening judgment and improves reasoning (Lipman, 2003) which leads to improve academic achievement and performance (Meece et al., 2003; Pasnak et al., 2008; Rajendran, 2008). Student's performance is the reflection upon their ability to demonstrate learning experiences and transfer of knowledge that is measured through systems of evaluation. Student's capacity to answer questions at higher order thinking level is very much dependent on the meta-cognitive skills; that is, the ability to think about and articulate problems. Studies have shown that students who perform well on difficult and complex task, who are perseverance in problem solving and apply intellectual skills are those who have meta-cognitive skills (Chang & Goh, 2002; Pogrow, 2005). In contrast, underachievers and low achievers have been found not lacking in cognitive skills but meta-cognitive skills. Low-achieving student students were often chronically engaged in lower order thinking assignments, in contrast higher achieving students, having mastered the skills were viewed as prepared to handle more complex learning task.