

Chapter I

Introduction

Background of the Study

Assessment has taken centre stage in the world of education today. Assessment should be done in tandem with teaching to ensure meaningful learning. The objectives of an assessment should be derived from the subject's objectives. What the students need to master and what is to be assessed, needs to be clear to both teachers and students, since this would allow teachers to provide guidance while the students can prepare themselves adequately before the assessment is carried out. The assessment evaluation of students' progress in learning needs to be addressed carefully in order to continuously motivate students to become lifelong learners. The concept underlying assessment of learning is that students become motivated learners when the processes and the purposes of assessment become meaningful, and are able to assist in developing human capital (Tognolini, 2005).

It is universally agreed that assessment should be more authentic, accessible, flexible and humane in nature as learners have different styles of gaining knowledge, skills and values in education (Brown & Hatie, 2005; Dunlop-Roberts, 2005). More humanistic forms of measurement are required in order to support teaching and learning, hence the need to practice assessment for learning at all levels of the education system.

The present system of assessment practiced by the Malaysia Examinations Syndicate (MES), aims at testing students' knowledge and skills mastery level in a certain field. This linear form of assessment assesses students' performance and is reported holistically in the Malaysian Certificate of Education. Reporting done in the

Malaysian Certificate of Education does not provide detailed information on actual performance. The method of certification does not inform a candidate whether he/she has fulfilled the minimum requirements or standard required by institutions of higher learning, or other concerned parties (Ministry of Education, 2002a).

As in most Asian countries, our educational system may be typically characterized as a bottleneck schooling track, with pressure or tension points at the end of primary, lower secondary and upper secondary or pre-University levels. For years, educators have repeatedly voiced their concern over this typical scenario and the authorities concerned are well aware of these problems. As a result, school and educational reforms were initiated on a large-scale, at the primary and secondary levels by the Ministry of Education (MOE) in the early 1990s. In 2002, the Ministry of Education restated the need to rely more on school-based assessments to measure students' performance, specifically in vocational subjects (Ministry of Education, 2002a).

A more transparent and holistic assessment is needed to complement such testing and to capture some qualitative aspects of students' achievement. Students' performance should be assessed with reference to a determined standard, for it to be recognized as an effective and qualified one. The certification system should also report more descriptively, to show mastery in a particular field of learning. In other words, assessment and certification should be able to give precise information on what students have learnt, mastered and could be used by them to progress in life.

Realizing the weaknesses in the present system, the Malaysia Examination Syndicate began to focus its attention on creating a new assessment system, to better evaluate students' performance. In 2002, several relevant vocational subjects were

introduced to secondary school students, in Form 4 and 5. The main purpose of this introduction was to produce skilled and semi-skilled individuals in the technical and vocational fields (Ministry of Education, 2002b). Together with the introduction, a new system of assessment and certification was introduced. Subsequently, twenty-two vocational subjects were identified and introduced in secondary schools in stages, from 2002 to 2005 (Ministry of Education, 2002a). These vocational subjects continued from 'Living Skills'– subjects which are taught at the lower-secondary level. The introduction of these new subjects, thus, provided an opportunity for the technically and vocationally-inclined students to further enhance their skills and become skilled personnel, who would then contribute to nation -building.

In order to achieve this objective, a more comprehensive, effective and practical method of assessment has been introduced. A modular approach is being used in the teaching and learning process for all the vocational subjects. Competency Assessment and Modular Certification (CAMC) was introduced by the Malaysia Examinations Syndicate (MES) to enable learners to possess sufficient knowledge and skills in their respective disciplines, so as to become effective and productive, skilled employees of the future. Competency Assessment and Modular Certification (CAMC) is an innovation in educational assessment with special characteristics such as flexibility, individualization and learning enhancements.

Competency Assessment and Modular Certification (CAMC) is different from the existing assessment system in that it is a module-based assessment compared to the latter, syllabus-based assessment. CAMC applies a modular approach as opposed to the previously-used linear system. In contrast to the present norm-referenced assessment,

CAMC is a criterion-based assessment, where learners' achievements are compared to specified criteria and not to other learners' achievements. Thus, CAMC is more learner-centered assessment unlike the system-centered assessment practiced at present. Learners were no longer tied to rigid assessment schedules and they now have the option to be assessed whenever they were ready. As an alternative to the current approach to assessment, where assessment is done only at the end of a learning process, CAMC offers an assessment conducive to better learning as it helps enhance learners' achievements. In addition to the Malaysian Certificate of Education (SPM), CAMC provides another certification with positive remarks on learners' level of competency accomplished in specific modules.

Teachers who were selected to teach the vocational subjects offered in their respective schools, attended workshops and training sessions at the Curriculum Development Centre (CDC), to learn how to use the modules and approaches needed to teach the new vocational subjects. They were also trained by the Malaysia Examinations Syndicate (MES) to adopt the new assessment strategy. These teachers who would be implementing Competency Assessment and Modular Certification (CAMC) learned how to use the CAMC modules, and to integrate these assessment strategies while carrying out the lessons according to the competencies specified in the modules.

According to Cheung, Hattie, Bucat, and Douglas (1996), allocation of human and other resources were usually biased towards the development phase of school-based assessment schemes and few efforts have been made by developers to monitor the degree of implementation of those schemes at the school level. Adi Badiozaman Tuah (2006), noted that the level of effectiveness of the school-based assessment to measure students'

learning, since its introduction in the 90s, depended on the assessment strategies adopted by teachers in schools. Since the mandated competency assessment reform in Malaysia required teachers to assess competency as outlined in the assessment modules, the Malaysia Examinations Syndicate (MES) expects that teachers' instructional practices will also change – to focus more on developing students' independent learning capabilities and to help students learn, how to learn. Efforts were directed to balance and broaden the curriculum that would work with diversified learning, teaching and assessment strategies. This included changing the focus on textbooks to diversified learning and teaching materials such as modules, changing from transmission of knowledge to 'learning how to learn', and providing more opportunities for students to explore their interests and abilities. Yoong (2006) stated that despite a well planned educational reform, there did not seem to be any significant change in the examination-oriented pedagogy in the school. He suggested that many factors relating to the concepts of an examination-oriented environment acted as barriers to school or policy reform in most Asian societies.

According to Brown (2004a), the need to understand basic matters before getting into a new dimension of assessment is critical to avoid any misconceptions which can cause ineffectiveness in the implementation of the assessment. This in turn can affect the implementation of government policies which are beneficial to those who are interested in the vocational field. Therefore it is crucial to understand factors that influence the implementation of school-based assessment of Competency Assessment and Modular Certification (CAMC) in order to ensure a smooth and effective implementation of policies related to the school-based assessment.

Statement of the Problem

Over the past decade or so, there has been criticism that the most widely-used traditional, multiple-choice tests failed to measure important aspects of learning such as, the ability to perform real world tasks nor did it provide enough information for teachers' instructional and diagnostics purposes (Resnick & Resnick, 1992; Wiggins, 1998). This growing concern over the heavy use of traditional multiple-choice tests has spurred interest in developing alternative assessment strategies, such as authentic assessments, performance-based assessments, portfolio assessments and competency-based assessments. These alternative assessment methods will benefit both students and teachers alike, in their learning and teaching practices. On the student's side, the new assessments will measure the kind of competency that matters in society, the workplace and in schools (Wiggins, 1998). On the teacher's side, the new methods will provide useful information for teachers to help improve student learning, by evaluating what students understood, and whether they could apply the knowledge in real-world situations (Darling-Hammond & McLaughlin, 1995).

The educational research in the United States has inspired global educators' need for more varied assessment methods in keeping with their increasing concerns with traditional multiple-choice tests. As a result, there has been an increase in school-based assessment, measuring practical work. Many educators (Buchan & Jenkins, 1992; Kempa, 1986; Pang, 1992) recommend an internal assessment of practical work, over external practical examinations or paper-and-pencil tests. They believed that school-based assessment schemes had many benefits, like the generation of more applicable and reliable information about students' practical performance, provision of formative

functions and promotion of teacher professionalism. Furthermore, the removal of central control or reporting has been found to encourage the adoption of school-based assessment. This policy has been vital in improving teaching quality in New Zealand, respecting the vital role teachers played in enhancing school effectiveness, while minimizing the negative consequences of national testing (Dixon, 1999).

Darling-Hammond (1997) observed that if the assessment tasks required students to learn actively, the students' attitude toward learning changed. Consequently, since the type of assessment played a powerful role in teachers' decision-making, about what and how to teach, reform proponents believe that changes in assessment practices could bring about changes in instructional and student learning practices. Those who advocated these changes claimed that performance assessments fostered quality instruction (Darling Hammond, 1997; Shepard, Flexer, Hiebert, Marion, Mayfield, & Timothy, 1995). Since the mandated competency assessment reform in Malaysia required teachers to assess skills, as displayed in competency assessment tasks, the Malaysia Examinations Syndicate (MES) also expects that teachers' instructional practices to change.

However, such changes, even if expected, are unlikely to occur easily nor quickly. Evidence showed that changing educational practices was not easy and became more difficult when the change involved transformation of the existing structure of schooling (Cuban, 1993; Tyack & Cuban, 1995). The performance assessment reform called for a deviation from traditional instruction and assessment practices, and thus challenged the established organizational school structure (Khatti & Sweet, 1996).

Cuban (1993) divided the reforms of the past century into incremental and fundamental changes. Incremental reforms aimed to change teachers' practices within the

existing structure of schooling, for example, by decreasing class size and adding new courses, under the assumption that the basic structure needed only a few repairs. Fundamental reforms assumed that the basic structure was flawed, and that a new one was needed. Thus, fundamental reforms were more difficult to implement.

In Cuban's terms, Malaysia's new forms of assessment (i.e. the CAMC) are fundamental reforms because they required a new paradigm. Shepard (2000) noted that in the new paradigm, curriculum, learning theory, and assessment was the direct antithesis of the principles in the old paradigm. New assessments needed to go together with new views of curriculum, teaching and learning. So, assessment reforms that sought fundamental changes were difficult to implement and sustain. Teachers who have long lived in the old paradigm found it difficult to implement these new assessments.

Despite the problems and challenges teachers faced, the current policy simply pushed them to implement these reforms, and many have struggled to implement it. An analysis was done by Kandar Selamat, Yahya Buntat, Muhammad Rashid Rajuddin and Ramlee Mustapha (2007) on the issues and challenges of implementing the CAMC for the vocational subjects as dictated by the MOE. They felt that this educational innovation was drastic, and needed a support mechanism in order to achieve the master plan. They further stated that the infrastructure required, such as laboratories, workshops and other equipment would be very costly and could in turn, affect CAMC implementation in schools. There could be many other issues that influenced the implementation of CAMC, and a comprehensive study needed to be conducted, in order to further facilitate its implementation (Kandar et al., 2007), who also pointed out that research was needed to

identify the key factors that would encourage teachers, who were central to this initiative, implement CAMC with excellence.

Fullan (1992) submitted that in order to achieve substantial education reform, educators must understand problems faced at the level at which change actually occurs. Cheung (2001) noted that many attempts at educational change had failed due to various reasons, but an important one – teachers’ concerns about the advocated innovation – was neither monitored nor addressed throughout the attempted educational change process. This change process can be analyzed on two levels, that is, the individual and the organizational (Zaltman, Duncan, & Holbek, 1973). Hall and Hord (2001) explained the significance of the individual level as follows:

Although everyone wants to talk about such broad concepts as policy, systems, and organizational factors, successful change starts and ends at the individual level. An entire organization does not change until each member has changed. Even when the change is introduced to every member of the organization at the same time, the rate of making the change and of developing skill and competence in using it will vary individually.....One implication of this principle is that leaders of organizational change processes need to devise ways to anticipate and facilitate change at the individual level. (p. 7).

Therefore, changing of policy or improving teaching practices, should start with understanding the problems and challenges teachers faced when they implemented the reform. In a preliminary study on vocational subject teachers, the researcher identified certain issues that affected the implementation of school-based assessment of CAMC.

These were logistics, teachers' knowledge and skills, teachers' attitudes, their conceptions of CAMC and their receptiveness to it, and CAMC's quality assurance measures.

Hall (1994), in his review of research into competency-based training and assessment, found that there was a marked lack of such research and that policy decisions were often made on flimsy, non-existent, or even negative research evidence. In addition, the empirical evidence of the degree of success of the implementation program was equally limited (Ruiz-Primo, 2006). While there has been much emphasis in Malaysia, on expanding the school-based assessment, specifically the Competency Assessment and Modular Certification (CAMC) in vocational subjects, relatively little research has been conducted on its implementation in schools.

A review of various local sources of records of research on assessment, such as the Educational Planning and Research Division (EPRD), MOE, University of Malaya (UM) and other local universities, showed that there were hardly any documented studies on the implementation of Competency Assessment and Modular Certification (CAMC). Therefore it is crucial to understand all factors that could influence the implementation of school-based assessment of Competency Assessment and Modular Certification (CAMC), in order to ensure a smooth and effective carrying-out of related policies. The findings from this study will provide input to making decisions, by policy makers, curriculum developers, the Malaysia Examinations Syndicate, vocational teachers, the Technical Education Department and researchers.

Theoretical Framework

This study adopts four aspects relevant to measuring the implementation of CAMC by vocational subject teachers, in secondary schools. The models adopted are— Degree of Implementation (DOI) (Cheung et.al, 1996), Teachers’ Receptivity to System-wide Educational Change (Waugh & Godfrey, 1995), The Role of Classroom Assessment in Teaching and Learning (Shepard, 2000) and Quality Assurance in Assessment (Toop, Gibbs & Worsnop, 1994).

The Degree of implementation (DOI) has been defined as the determination of how close the implemented program is, to its original design or as intended (Dusendury, Brannigan, Falco & Hansen, 2003; Snyder, Bolin & Zumwalt, 1992). Studying the DOI helps us understand how the accomplishment of a program can affect the manner in which goals are achieved, and more importantly, how the implementation can be improved when the program is disseminated or scaled up. Most educational implementation has been studied from this perspective. The best program in education will still fail to have the intended impact if its essential elements are not implemented properly. The Degree of implementation (DOI) is critical for drawing a valid conclusion to program outcomes (Scheirer & Rezmovic, 1983). Cheung et al. (1996) suggested five dimensions in their conceptual framework for measuring the degree of implementation of school-based assessment schemes. The five dimensions are (i) logistics arrangements, (ii) use of assessment activities, (iii) quality of relationship between assessment, teaching and learning, (iv) knowledge of the characteristics of the assessment scheme and (v) attitude towards school-based assessment. These dimensions were said to be applicable to a wide

range of school-based assessment schemes, providing a common perspective to facilitate comparative analyses of findings from different studies.

Implementation is successful when the teachers carry out the curricular change as directed, which allows for the curricular change itself to be fairly evaluated (Snyder et al., 1992). According to Cuban (1992), curriculum knowledge is primarily created outside the classroom by the experts, who design and develop the curriculum innovation. Change is conceived as a linear process when teachers implement it in the classroom. He stated that the curriculum was evaluated to determine whether the planned outcomes have been achieved, with the teacher's role differing depending on one's perspective. From the fidelity perspective, the role of the implementing teacher is one of a consumer – who should follow the directions and implement the curriculum as designed by those possessing curriculum knowledge (Cuban, 1992). Being the deliverer of the curriculum to students, the role of the teacher is recognized as being critical to the success of the curriculum. The curriculum cannot achieve its aims or be fairly evaluated, unless the teacher implements as planned.

On the other hand, Waugh and Godfrey (1995) suggested that planned educational changes, when successful, have a life-cycle that could be divided into three stages: initiation, implementation and routinization. According to them, initiation referred to the processes and planning which lead up to, and include, the decision to proceed with the change. Implementation referred to the first use of the change on a system-wide basis in the classroom. Routinization referred to whether the change became part of the system. They developed a general model which could be applied to any system-wide educational change in its implementation stage under the centralized educational system.

Teachers' receptivity, in terms of their perceptions of the important variables affecting receptivity, could provide important insights into the way teachers relate to system-wide change (Waugh & Godfrey, 1995). They suggested six variables to measure teachers' receptivity; 'perceived cost benefit of the change', 'practicality in the classroom', 'alleviation of fears and concerns', 'participation in decision-making at school', 'perceived improvements of the new system compared with the previous system' and 'perceived support from senior teachers and the principal'.

Shepard (2000), is of the opinion that any attempt to change the form and purpose of classroom assessment, to make it a more fundamental part of the learning process, must acknowledge the power of enduring and hidden beliefs. She suggested that a dissonance between instruction and assessment arose because of the misfit between the old views of testing, and the transformed vision of teaching. However, even reformed versions of instruction have only begun to be implemented. According to the many documented studies of teacher change and attempted educational reform, all three parts of the old paradigm that is, social efficiency, behaviorism and scientific measurement continued to provide a mutually reinforcing set of ideas that shaped current thinking and practices (Shepard, 2000).

Clearly, the abilities needed to implement a reformed vision of curriculum and assessment, are challenging. Cremin's (1961, in Shepard 2000) earlier observation showed that progressive education required "infinitely skilled teachers", who would ask the right questions at the right time, anticipate conceptual pitfalls and have a repertoire of tasks that would help students take the next step to acquiring deeper knowledge of the subject matter. Teachers would also need help in learning to use assessment in new ways.

Shepard, (2000) stated that given the likelihood that the new ideas about the role of assessment would be at odds with prevailing beliefs, teachers would need assistance to reflect on their own beliefs as well as those of students, colleagues and school administrators. She says, this was because the teachers' beliefs, knowledge and skills were key to bringing about change in assessment practices.

Toop et al. (1994) established a framework for quality assurance in assessment system that included elements of a comprehensive quality assurance strategy, such as screening and training of assessors to ensure assessor competency, verification of assessment decisions (both internally and externally), appeal mechanisms and process, and monitoring and review of the assessment systems. The level of expertise required in carrying out assessment in vocational and technical education has been well acknowledged. Evaluating vocational and technical education assessment demanded a substantial amount of knowledge and judgment about the student's performance (Smith, 2000). The inconsistencies in assessment practices, limitations in assessor training and the lack of ongoing professional development could influence assessment outcomes.

Proposed Model of the Study

The proposed model of this study is an *a priori* model based on the literature review. Figure 1.1 below shows the proposed model of factors influencing the implementation of Competency Assessment and Modular Certification (CAMC) of vocational subjects in secondary schools. The proposed model consists of the inter-relationships and the causal effect of four latent variables on the implementation of CAMC. This model was postulated based on knowledge related to educational change theory and on empirical research in the area of this study.

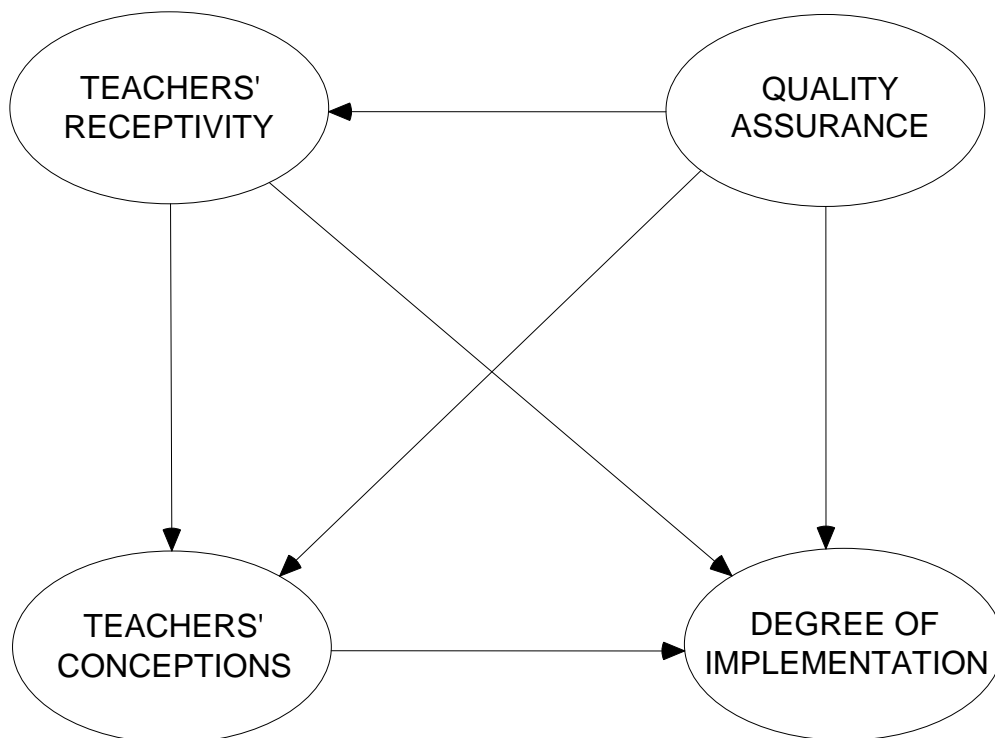


Figure 1.1. A priori model factors influencing the implementation of Competency Assessment and Modular Certification (CAMC) of Vocational Subjects in Secondary Schools.

Degree of Implementation (DOI)

Scheirer & Rezmovic (1983), stated that the Degree of implementation (DOI) was critical to drawing valid conclusions on program outcome. Even the best program in education will fail to have the intended impact if its essential elements were not implemented properly. Like other constructs (e.g., intelligence, self esteem), the Degree of Implementation (DOI) cannot be directly observed; it can only be inferred from the measurement of some pre-defined observable human behaviors (e.g., the use of certain teaching strategies), psychological processes (e.g., implementers' attitudes towards the curriculum), physical environment, administrative procedures and so on (Cheung et al., 1996).

In reviewing this model, Cheung et al. (1996) stated that the DOI was represented as a multidimensional construct, consisting of three hierarchically related concepts. Each dimension of this construct was broken into attributes, and these into content areas. Attributes are those relatively independent features that need to be considered in order to measure the DOI along a particular dimension. They further explained that the content areas were the basic domains of specification, for measuring an attribute and were the ultimate theoretical basis for the construction of the instruments.

A total of five dimensions were found to be necessary and sufficient, for conceptualizing the construct to measure the degree of implementation (Cheung et al., 1996). They are 'logistics arrangement', 'use of assessment activities', 'quality relationship between assessment, teaching and learning', 'knowledge of the characteristics of the assessment scheme' and 'attitude towards school-based assessment'. These dimensions will be used and modified for the present study. The rationale for

choosing these dimensions is discussed as follows.

The first dimension is ‘logistics arrangement’. This dimension refers to the supply of teaching aids, the filing of written records by teachers and students, and the extent to which certain important aspects about a given school-based assessment scheme, has been discussed in class (Cheung et al., 1996). One of the most important dimensions of the implementation support system is the technical support provided. According to Greenberg, Domitrovich, Graczyk and Zins (2005), this support includes the structure, equipment, training, content, funds and any on-going support required for a successful program implementation. They also included additional technical assistance or materials to be provided in the implementation process. Thus, this dimension focused on the organizational structure of the local setting, as well as teachers’ access to information and technical support to implement the CAMC.

The second dimension is ‘use of assessment activities’. This dimension referred to the degree of the teacher’s use of different assessment methods and grading strategies, as well as their participation in various assessment activities. Extent of teacher knowledge, gender and teaching experience were found to be significant predictors of usage (Cheung et al., 1996).

The third dimension is ‘quality relationship of assessment, teaching and learning’. This dimension considered how teachers implemented school-based assessment during the normal teaching and learning process, according to the curriculum developers’ concepts and ideologies. The DOI was inferred by measuring the extent of unity of assessment with curriculum and pedagogy, and the presence of any adverse effects of the implementation of internal assessment, on teaching and learning (Cheung et al., 1996).

The fourth dimension is 'knowledge of the characteristics of the assessment scheme' of the CAMC. The teachers' comprehension of the requirements and philosophy of a given school-based assessment scheme is considered in this dimension (Cheung et al., 1996). According to Greenberg, et al. (2005), indicators of implementer readiness included the fact that teachers had adequate skills to carry out the new educational reform, felt positive about a program, valued what it contributed to the educational setting and were committed to its goals. The confidence teachers displayed in the effectiveness of a new program, and in their own knowledge and skills affected their ability to implement a program successfully (Cheung et al., 1996).

The final, fifth dimension is 'attitude towards school-based assessment'. This dimension is concerned with teachers' opinions on the continuous assessment of practical work they do in schools, their attitudes towards it based on the evaluation of how the school-based assessment is managed, and the outcomes expected of the school-based assessment (Cheung et al., 1996).

Factors influencing the Degree of Implementation

In this study three variables were chosen and considered to have an influence on the Degree of implementation (DOI) of CAMC. The selected variables are 'teachers' receptivity to CAMC', 'teachers' conceptions of CAMC' and the 'quality assurance measures of CAMC'. The rationale for choosing these variables are discussed as follows.

Teachers' Receptivity to CAMC

Teachers' receptivity to system-wide change, that is, CAMC was chosen as one of the major factors that could have a strong influence on the degree of implementation (DOI). Waugh and Godfrey (1995) noted that teachers would not implement major curriculum and assessment changes if they are not receptive to the reform. Collins and Waugh (1998) study found receptivity to be related to teachers' general beliefs. In addition, in Datnow and Castellano's (2000) study, they found that teachers supported and accepted reform when they believed it beneficial to students.

This study investigates six variables that measured teachers' receptivity to system-wide change which was thought to influence the degree of implementation (DOI). These six perceptions could offer pointers to educational administrators and policy-makers on how best to tailor system-wide change, so that teachers will be more receptive to the changes at the implementation stage (Waugh & Godfrey, 1995). Waugh and Godfrey (1995) applied the variables in this model to centralized certification, the curriculum and the implementation of system-wide assessment changes in the centralized educational system. These variables were modified for the present study as considered appropriate. The rationales for choosing these six variables are discussed, as follows.

The first variable is the 'perceived cost benefit of CAMC' to the teacher. Waugh (2000) viewed the cost benefit variable as a ratio of the amount of return against the amount of investment, relating to the effects of the change on the teacher and the students, as perceived by the teacher. That is, the teacher will have a positive cost benefit if the work involved in implementing the change at the school level is thought to provide benefits such as increased student learning and increased satisfaction in teaching, and

vice versa. In the Waugh and Godfrey (1995) study, it was suggested that the administrator tailor their change proposals so that teachers perceived a non-monetary cost benefit as a result of implementing the change. This benefit could be in the form of increased satisfaction with their teaching, better student learning, better matching of courses to student needs, interests and abilities, and easier school administration, besides enhancing the implementation CAMC.

The second variable, the 'practicality of CAMC in the classroom', is to measure the extent to which the teachers perceived the course outlines or syllabus, to be practical in the classroom. This variable was suggested by Doyle and Ponder (1978) and was used successfully in the study of the Certificate of Secondary Education in Western Australia by Waugh and Punch (1987). Waugh and Godfrey (1995) found that sufficient resources should be allocated to allow teachers to implement the change in each subject, and at each school, as faithfully as possible to the new plan. Teachers also need to be able to manage the day-to-day running of their classroom and any new plan needs to allow them to do so with minimum problems – otherwise the teachers were likely to compromise it. Thus, the practicality of the CAMC in the classroom is hypothesized to be of great advantage, resulting in better implementation of CAMC.

The third variable is the 'alleviation of fears and concerns'. Following an idea proposed by Giacuinta (1975), Waugh and Punch (1987), noted that aspects such as knowledge, understanding, clarity of the change proposal, lack of feedback and meetings could all be grouped under the variable, 'the alleviation of fears and uncertainties', because they either aided or hindered the implementation of change through the mechanism of communication. They found that this variable was related to teachers'

receptivity to the Certificate of Secondary Education System in Western Australia. That is to say, as changes were being implemented, teachers would be more receptive to it if school administrators provided a means whereby fears and concerns could be raised and addressed. Waugh and Godfrey (1995) thought that administrators should set in place strategies and mechanisms through which teachers could raise their concerns about the plan, and to have those concerns answered, in order to attain the faithful implementation of educational reform.

The fourth variable is 'participation in decision making at school'. This variable was identified in a major review of the literature by Conley (1991) as playing an important part in teachers' attitudes to change. She found that teachers examined such aspects as authority versus influence, actual outcome versus expected outcomes, and classroom decisions versus administrative decisions, in relation to changes that had to be implemented in their schools and their classroom. According to Waugh and Godfrey (1995), the school principal and senior staff should arrange for teachers to take part in decisions about the change which would affect the school and, in particular their classrooms. It would seem that teachers were more likely to implement a new plan with less compromise, if they had a say in how the CAMC was to be implemented in their classrooms.

The fifth variable is 'perceived improvements of CAMC compared with the previous system'. Regarding system-wide change, Waugh and Punch (1987) found that teachers' attitude to the preceding system was positively related to attitudes to the new system, when the new system focused on demonstrated improvements. This variable was used in the study conducted by Waugh and Godfrey (1995) to elicit teachers' feelings

when comparing the systems. They found that teachers were more likely to have a positive attitude towards change if it was perceived to be offering clear advantages over the previous system. Thus, when teachers' believed CAMC to be an improvement as compared to the earlier system, it was thought to positively influence the implementation CAMC.

Lastly, the sixth variable is 'perceived support from senior teachers and principal'. According to Waugh and Godfrey (1995), teachers were more likely to have positive attitudes towards a change, if the principal and senior staff publicly supported the change, in their communications and actions at the school. This meant that, when the senior staff communicated the advantages and benefits of the change, they should do so in an objective way without making exaggerated claims. Cheung (2001) found that administrative support, particularly from the school principal, to be of primary concern in implementing change. Fullan's theory of educational change also highlighted the importance of working relationships among teachers in implementing change: collegiality, open communication, trust and support were all closely interrelated (Fullan, 2001).

Teachers' Conceptions of CAMC

Teachers' conceptions of CAMC were considered an important factor in influencing the Degree of Implementation (DOI) of CAMC. This variable was important because evidence showed that teachers' conceptions of assessment, that is the CAMC, influenced the conviction with which they taught, what students learnt or achieved and how learning was evaluated (Brown, 2003; Calderhead, 1996). The implementation of

any new assessment policy, tool or practice, whether at the national or local school level, needed to take into account the teachers' conceptions of assessment to ensure its success.

According to Cohen and Hill (2000), teachers' beliefs could be influenced by manipulating elements of instructional policy in educational reform. This would in turn help improve students' performances. Studies also showed that the relationship between teachers' beliefs and their practices was significant in educational reform (Basturkmen, Loewen, & Ellis, 2004; McAllister & Irvine, 2002; Tardy & Snyder, 2004; Yung, 2002).

Mander's (1997) study demonstrated that teachers' personal and biographical factors, the school's support, the role of the principal and teachers' participation in decision making shaped teachers' practices. Educational reform and the use of new curriculum material and activities also played a significant role in changing teachers' practices (Powell & Anderson, 2002). According to Powell and Anderson in most educational reform, substantial professional development effort, such as training, needed to be provided to the teachers on the usage of the new curriculum materials and activities. The role of professional development could not be ignored because the adoption of a new curriculum entailed changes in teaching practices resulting in improved student learning and attitudes. There was a complex relationship between knowledge, practices and beliefs. Guskey (1986) found that professional development activities were most effective at changing beliefs when it helped teachers to adopt a new practice, and so it could be argued, changes in belief would be followed by changes in practice.

Kahn (2000) pointed out that teachers appeared to assimilate new assessment practices into long-standing transmission, teacher-oriented, accountability-type assessment and learning frameworks. Certainly the implementation of new standards

mandated by professional bodies or state authorities, while well intentioned, could actually reduce effectiveness, if the teachers' conceptions of CAMC remained unchanged or unchallenged, or if teachers remained unaware of their own conceptions (Brown, 2003). Thus, teachers who are aware of their conceptions of CAMC are hypothesized to have greater influence in implementing CAMC.

The Quality Assurance Measures of CAMC

The quality assurance measure of CAMC is an important factor that could influence the Degree of Implementation (DOI) of CAMC. There are two quality control variables in the implementation of the competency assessment and modular certification (CAMC) framework – the monitoring and the moderation processes. These variables are vital because they form the quality control strategy of the CAMC framework. (Ministry of Education, 2002b). Thus, these variables that measure the quality of the CAMC and which could influence the degree of implementation (DOI), are included in this study.

'Monitoring' helped ensure that internal assessment is challenged regularly. It provided a clear and comparable analysis of the quality of vocational and technical education through grading systems and reports (Smith, 2000). Toop et al. (1994) suggested that the quality of monitoring could influence the quality of implementation of an assessment process. They went on to suggest that monitoring was the main tool in the quality assurance mechanism, in improving educational assessment. They found that monitoring increased teachers' commitments, and also improved the assessment processes besides raising the standards of the assessment outcome.

Toop et al. (1994) noted that moderation involved a moderator examining a sample of evidence of students' performance to determine whether they agree with the judgment of the assessor. Feedback to the assessors included advice on improving their assessment procedures or evidence gathering, and adjusting the assessment standards that constitutes competence. They also stressed that the overall purpose of both internal and external moderation was not just to adjust marks and settle disputes, but equally to improve the quality of assessment implementation process.

In reviewing other factors that may be related to quality assurance, Gift and Hutchinson (2007) examined the outcomes of quality assurance programs, and found that the academic staffs were receptive and increasingly implemented the recommendations of review teams, when facilitated by the university's monitoring mechanism. In Hargraves, Palmer, Orav & Wright, (1996) study, they found that there were differences in medical practitioners' receptiveness to a new design of intervention. Many of them preferred an internal review to an external one, for them to be more receptive to the change. In addition, a number of studies showed that quality assurance measures in education shaped teachers' conceptions of the educational reform (Farrugia, 1996; Kember, 1997; Stevenson, MacKeogh & Sander, 2006).

Rationale of the Study

Although current assessment reform studies emphasized the significance of teachers' receptivity, teachers' conceptions and the quality assurance measures of the implementation (Brown, 2003; Toop et al., 1994; Waugh & Godfrey, 1995) some critical gaps remain. First, although the three factors were always advocated as the most important factors for implementation, few studies have examined whether they directly or

indirectly affected the implementation. In addition, in assessment reform literature, few studies have examined the moderating effects of demographic variables. Among those few, Mok's (2005) study yielded information that teachers' gender and teaching experiences moderated their concern and educational innovation. His study among Hong Kong primary teachers indicated that females and teachers with longer years of teaching experience were more likely to adapt to educational innovation.

To the researcher's knowledge, no local study has yet empirically tested the moderating effect of gender, teachers experience, training and field of specialization on teachers' receptivity, teachers' conceptions or quality assurance measure outcomes. Hence, testing of the moderating and mediating effects of the selected variables aimed to fill these gaps in the literature.

Purpose of the Study

This study aimed to test whether the proposed model of factors influencing Competency Assessment and Modular Certification (CAMC) of vocational subjects in secondary schools, fitted the empirical data collected from the teachers. It also intended to test if selected demographic variables such as gender, experience, training and field of specialization moderated the proposed model, to modify the proposed model for a better-fitted, parsimonious model, and to determine issues and challenges in the implementation of CAMC. Specifically, this study examined factors that influenced teachers' implementation of this reform. The objectives of the study are outlined as follows.

Objectives of the Study

1. To test if the proposed model of factors influencing Competency Assessment and Modular Certification (CAMC) of vocational subjects in secondary schools fits the empirical data collected from the teachers.
2. To test if the selected demographic variables such as gender, experience, training and field of specialization moderated the proposed model of Competency Assessment and Modular Certification (CAMC) of vocational subjects in secondary.
3. To modify the proposed model for a better-fitted, parsimonious model based on the data collected.
4. To identify issues and barriers faced by the vocational teachers in implementing Competency Assessment and Modular Certification (CAMC) and to obtain information and suggestions from the teachers on how to improve the implementation of Competency Assessment and Modular Certification (CAMC).

Research Questions

- (1) To what extent does the *a priori* model fit the data collected?
- (2) To what extent do teachers' conceptions, teachers' receptivity and quality measures have significant direct and indirect influence on the degree of implementation of CAMC?
- (3) To what extent does gender moderate the proposed model?
- (4) To what extent do teachers' experience moderate the proposed model?

- (5) To what extent does training moderate the proposed model?
- (6) To what extent does field of specialization moderate the proposed model?
- (7) What is the parsimonious model of factors influencing the degree of implementation of CAMC?
- (8) What are the issues and barriers faced by the vocational teachers in implementing Competency Assessment and Modular Certification (CAMC) and what are suggestions from the teachers on improving the implementation of Competency Assessment and Modular Certification (CAMC)?

Significance of the Study

This study attempts to provide policy-makers, school administrators and teacher educators with information on what is needed to help teachers successfully implement an assessment reform by examining factors influencing the implementation. Investigating teachers' enacted practices, as translated from the policy's intended practices, is important for understanding the progress of the reform. Based on a diagnosis of the current progress of the reform, policy-makers, especially the Malaysia Examination Syndicate (MES), and teacher-educators can design future plans to help teachers successfully implement assessment reform. According to Dusenbury et al. (2003), studying implementation is important for a variety of reasons, all of which are related to gaining an understanding of how the quality of implementation can be improved when new programs are disseminated. One of those reasons was that it allowed researchers identify what has been changed in a program and how those changes impacted outcomes. Hence, understanding the relationship of the factors--(chosen for this study)--to the

degree of implementation of CAMC is important for making decisions on the part of policy-makers, such as curriculum developers (CDC), the Malaysia Examinations Syndicate (MES), teacher-educators, vocational teachers, school administrators and implementation researchers.

The Ministry of Education (MOE) undertook a major revamp of the vocational curricula, beginning 2002. The new vocational subjects used the modular approach in the teaching and learning process. The variations offered in this program was accompanied by a variation in the assessment system - the modular approach needed a different assessment system to the one currently practiced by the Malaysia Examinations Syndicate. Otherwise, initiatives or innovations introduced may fall back on normal practice with the emphasis on examination. Therefore, this study is important as it would provide input, especially to the Malaysia Examination Syndicate (MES) for this assessment reform.

The structural model will reflect the inter-relationship between the selected factors, their direct and indirect effects, and their mediating and moderating effects on the degree of implementation of school-based assessment of CAMC. This study also attempts to expand upon previous studies that examined the effect of teachers' receptivity, teachers' conceptions, and quality assurance measures of assessment, on the degree of implementation. Although there is a large body of literature that described teachers' receptivity, teachers' conceptions, quality assurance measures of assessment and degree of implementation, relatively little research has been conducted to examine their effect on the degree of implementation (DOI). This study does so, by examining their effect on DOI and providing such evidence.

In addition, most of the current literature on teachers' receptivity to change, teachers' conceptions, teachers' practices, quality assurance measure of assessment and the degree of implementation of educational assessment reform, gives a western view of phenomena and very little is known of the Malaysian perspective. The extensive statistical methodology, Structural Equation Modeling (SEM) which takes a confirmatory approach to the analysis of a structural theory bearing on a phenomenon (Byrne, 2001) was used, and the findings of this study provide evidence to the Malaysia Examinations Syndicate (MES) on the effect of the selected factors to the degree of implementation (DOI). It also provides useful information that will help at all levels involved in implementing CAMC, in designing or planning for training, monitoring and moderation strategies according to the factors that influence the degree of implementation of CAMC in particular, and for all the school-based assessment in general. The instrument developed in this study also could be used to investigate the implementation of new assessment schemes.

Limitations of the Study

Studies conducted in the form of a survey research in a natural setting are normally accompanied by multiple limitations. One of the limitations was the reliance of the research on self-reported measures in the form of a questionnaire survey method as the main source of gathering data. The current study depended and presumed mostly on teachers' openness and sincerity when responding to the questionnaire. Another limitation specific to the current study is in relation to representation of population. The samples of this study were teachers implementing CAMC, chosen from academic schools

offering vocational subjects from 2002 to 2007. Thus, the sample was from a population of academic schools that had been selected to offer the twenty-two vocational subjects nation-wide. Conclusions drawn from this study could therefore be generalized to all teachers teaching vocational subjects and implementing the CAMC in the secondary schools in Malaysia.

SEM cannot test directionality in relationships. The directions of arrows in a structural equation model represent the researcher's hypotheses of causality within a system. The researcher's choice of variables and pathways represented will limit the structural equation model's ability to recreate the sample covariance and variance patterns that have been observed in nature. Because of this, there may be several models that fit the data equally well. In spite of this, the SEM approach remains useful in understanding relational data in multivariate systems. The abilities of SEM to distinguish between indirect and direct relationships between variables and to analyze relationships between latent variables without random error differentiate SEM from other simpler, relational modeling processes.

The development of both the measurement model and the structural were constrained to the variables chosen in this study. There may be other factors influencing the degree of implementation (DOI) of CAMC not mentioned in this study. However, the variables and dimensions chosen in this study were deemed to be the most relevant, as supported by the literature to most affect the implementation of CAMC.

With the constraints mentioned above, the best model that could be constructed by the researcher was confined to the selected variables and dimensions considered

relevant to CAMC implementation. The result of the study was analyzed and conclusions and implications were drawn based on the proposed model.

Definition of Terms

The key terms involved in this study, as listed below are most appropriate for the context of this study only. These are as follows:

Degree of Implementation (DOI)

Degree of implementation has been defined as the determination of how close the program is implemented according to its original design or as intended (Dusenbury, et al. 2003). Degree of Implementation (DOI) of CAMC refers to the degree to which teachers implement the school-based assessment of Competency Assessment and Modular Certification (CAMC) of vocational subjects in secondary schools as intended by the Ministry of Education (MOE). There are five variables measuring DOI and are defined as follows.

Logistics Arrangement

Logistics Arrangement refers to the supply of teaching aids, filing of written records by teachers and students and the extent to which certain important information is given about a school-based assessment scheme (Cheung et al., 1996). Thus, in this study this dimension focuses on the organizational structure in the local setting as well as teachers' access to information and technical support in implementing the school-based assessment of CAMC.

Use of Assessment Activities

Use of Assessment Activities in this study refers to the degree to which the teacher uses the assessment methods and grading strategies as well as students' participation in the school-based assessment of CAMC.

Quality Relationship of Assessment, Teaching and Learning

Quality relationship of Assessment, Teaching and Learning in this study refers to how teachers implement school-based assessment during the normal teaching and learning process according to curriculum developers' conceptions and ideologies.

Knowledge of the Characteristics of the Assessment Scheme of CAMC

Knowledge of the characteristics of the assessment scheme of CAMC among the vocational subjects teachers in this study refers to whether teachers understood the requirements and philosophy of a given school-based assessment scheme. This included the question of whether they had adequate skills to carry out the new educational reform, if they felt positive about a program and valued what it contributed to the educational setting and were committed to its goals.

Attitude towards School-based Assessment

Attitude towards school-based assessment in this study concerns teachers' opinions about the school-based assessment of CAMC that they were carrying out in schools.

Teachers' Receptivity to CAMC

Teachers' receptivity to CAMC in this study refers to their perceptions of the variables that affected their receptivity to CAMC. The variables measuring receptivity offered pointers to educational administrators and policy-makers on how best to make teachers more receptive to changes at the implementation stage (Waugh & Godfrey, 1995). There are six variables measuring teachers' receptivity to CAMC in this study and are defined as follows.

Perceived Cost Benefit of CAMC to the teacher

Perceived cost benefit of CAMC to the teacher in this study refers to the ratio of the amount of return to the amount of investment relating to the effects of the change for the teacher and the students, as perceived by the teacher. That is, the teacher will have a positive cost benefit if the work involved in implementing the change at the school level is perceived to provide benefits such as increased student learning and increased satisfaction in teaching, better matching of courses to student needs, interests and abilities and easier school administration.

Practicality of CAMC in the classroom

In this study, practicality of CAMC in the classroom is to measure the extent to which the teachers believe the course outlines, syllabus, the assessment format and method to be practical in the classroom.

Alleviation of Fears and Concerns

Alleviation of fears and concerns in this study refers to teachers raising their concerns about the plan and to have those concerns answered in order to attain the faithful implementation of School-based Assessment of Competency Assessment and Modular Certification (CAMC).

Participation in Decision Making at school

This variable refers to teachers taking part in decisions about the change which affected the school and, in particular, the vocational subjects that were taught. Teachers should have a say in how they carried out the school-based assessment of CAMC in their classrooms.

Perceived Improvements of CAMC Compared with the Previous System

Perceived Improvements of CAMC compared with the previous system in this study refers to teachers' attitudes to the new system which focused on demonstrated improvements and teachers' perceptions towards the school-based assessment of CAMC as compared to the older assessment system.

Perceived Support from Senior Teachers and Principal

Perceived support from senior teachers and principal in this study refers to teachers' perceptions of the support of their principal and senior staff for the school-based assessment of CAMC, via their communications and actions at the school.

Quality assurance Measures of CAMC

The quality assurance measures of CAMC refer to the quality control strategy in the CAMC framework. (Ministry of Education, 2002b). There are two quality control variables in the implementation of competency assessment and modular certification (CAMC) the monitoring and the moderation processes. These variables that measure the quality assurance measures of CAMC are defined as follows.

Monitoring

In this study, monitoring refers to the monitoring measures taken by the Ministry of education as part of the quality assurance strategies in the implementation of school-based assessment of CAMC.

Moderation

In this study, moderation refers to the internal and external moderation done by the personnel appointed by the Malaysia Examination Syndicate as part of the quality-assurance strategies in the implementation of school-based assessment of CAMC.

Teachers' Conceptions of CAMC

Teachers' Conceptions of CAMC in this study refers to teachers' beliefs, meanings, concepts, rules and preferences of school-based assessment of CAMC. In this study, teachers' conceptions referred to their beliefs, what they understood, and how they inter-acted with the implementation of CAMC.

Competency Assessment and Modular Certification

Competency is a set of tasks which integrates knowledge, skills and attitudes in the use of equipment, materials and specific techniques to complete a task related to a certain vocation. Competency assessment is a process of obtaining information and assessing students' capability in carrying out a certain task, based on a fixed standard and criteria. Modular certification is recognition in the form of printed statements based on the level of competency achieved in a module.