

COMPUTER TECHNOLOGY COMPETENCIES PERCEIVED AS NEEDED BY
VOCATIONAL AND TECHNICAL TEACHERS IN MALAYSIA

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

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2005

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ABSTRACT

The purpose of the study was to explore and describe the perceived competencies, importance, and educational needs in computer technology among vocational and technical teachers in Malaysia. The study was also to investigate the relationship among the selected demographics characteristic of vocational and technical teachers in Malaysia with perceived computer technology educational needs.

A survey was conducted. The population studied involved Malaysian full-time vocational and technical high school teachers (N=284) employed by the Ministry of Education, Malaysia, during the 2003-2004 academic year. Two hundred and eighty-four teachers from nine vocational and technical schools were selected to participate in this study. Data were gathered via a mailed questionnaire and the questionnaire consisted two parts that measured the teachers' perceived importance and competence, and demographic information on the sample.

The study showed that over 50% of the Malaysian vocational and technical teachers had not had formal computer technology training. Only 63% of the Malaysian vocational and technical teachers had a bachelor's degree or higher. The lowest computer technology educational needs of Malaysia vocational and technical teachers were

computer operating skills. Media communication and telecommunication were the top two areas of educational needs among the eight domains of computer technology. The educational needs increased when the computer technology skills were more complicated.

Demographic characteristics such as age, gender, years of teaching, and having a computer at home had low to negligible relationships with computer technology educational needs. Teachers' degree held and computer technology educational experiences had negligible to low relationship with educational needs.

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CHAPTER 1

INTRODUCTION

Technological advances and the accelerated transfer of information, along with related computer knowledge, skills, and abilities, have been of paramount importance in an information society. Many changes have occurred in this arena, and these changes have been especially important to vocational and technical programs in supporting workforce development. Computers have been pervasive in the work place, and in the home. The changes have shown how important the technologies have become to our daily life. The technologies have been not only for people in the computer science field, but also to all people to enable them to have a better quality of life.

The growth and use of computers and computer-related technology have been limited only by one's imagination in how they can support human resource development, and the preparedness of individuals for the workforce. Preparation may begin at home. A linking of formal and informal education has impacted professional educators and these related responsibilities in instructional design and delivery in educational settings. The teacher has been the change agent between the learner and technology, and plays a critical role in the process of teaching and learning. Therefore, the teacher should

stay abreast of changing technology and current opportunities in order to assure his/her place of leadership in instructional technology. Superior programs, in turn, have been supported by the needs from business and industry for better prepared individuals for the global workforce.

Technology also has affected the way education is delivered for preparing workers. To be more specific, technology affects career and technical/vocational education (CTE) or CVE. According to Wanocott (2001), information and communication technology (ICT) has become a powerful technology tool in delivering CVE program around the globe. Before that, in 1998, McKenzie also noted that computer and information technology would be used broadly in delivery the CVE programs in the future, in response to technology changes, particularly in the educational system. Many scholars support using computers in educational activities. Zirkle (2002) noted that new technologies such as a computer promise us rich education experiences. Goldberg (1996) also supported the argument. He reported that students who were taught using both traditional methods and the internet performed better than those who were only exposed to the traditional methods. Day, Raven, and Newman (1998) also found that students who were taught using computer application with a laboratory achieved at a higher level than those students who were taught using the traditional classroom approach.

The scenario also has happened in the Malaysian Educational System. In the last ten years, information and communication technology (ICT) and computer technology application have become widely used in secondary and postsecondary educational institutions. ICT has become the first choice among technology tools.

Schools started to receive computers and ICT equipment to enable them to utilize computer technology and the Internet. Computers and ICT equipment would be the important technology tools for delivering education to all Malaysians. The future also will involve vocational and technical education programs to ensure workers are effectively prepared for the changes in the work place.

Educational System in Malaysia

The Malaysian educational system has accepted the challenge of globalization by changing not only the content of curricula and programs but, more importantly, the delivery system. Information technology-enhanced teaching and learning have already been applied in schools through distance learning, and the Internet. Malaysia, as a developing country, has had to accelerate change to achieve a significant transformation of its educational system in order to meet the needs of workers in a technologically competent and scientifically adept society. Malaysia, therefore, primed the educational system to enable the education of a pool of well-educated, highly skilled and strongly motivated professionals.

Malaysia has provided 11 years of free schooling, and 20.4% of the annual National Budget has been allocated for education. Malaysian children generally have begun their formal education at the pre-school level, for children of four, five and six years old. After finishing pre-school, they go to the elementary school until 12 years old and their high school education starts at 13 years old and continues until 17 years old.

Excellence has been sought through a carefully designed system that allows flexibility for individual approaches. The situation has been apparent at the pre-school

and again at tertiary level. However, primary and secondary education has been highly structured, with a curriculum that enables the sound acquisition of fundamental knowledge and skills that are required for further education or to go to work.

After finishing high school, the students can go to a college preparation program, such as matriculation programs that prepare students for entry into local and foreign universities. At the same time, the high school graduates can also go to certain universities to enroll in the diploma and baccalaureate program. Alternatively, they can choose to attend public vocational and technical education training institutions, such as polytechnic and community colleges, or attend private vocational and technical education training programs.

Vocational and Technical Education in Malaysia

Vocational and technical education programs in schools have been administered by the Technical Education Department, Ministry of Education. The department was established in 1964. The major role of this department has been to ensure the continuity of educational policies and stimulate progress of technical and vocational education in Malaysia. In managing technical education, the Department of Technical Education provides services in research, planning, implementation, coordination, and supervision as well as monitoring the development of vocational and technical education as a central agency to cover both the lower secondary level and the polytechnics.

The vision of the department has been that technical education can help in developing an excellent person. The Technical Education Department also stated their mission was to develop a world class vocational and technical education system to meet

the current needs of the nation. The Technical Education Department's function normally includes the conceptualization of policy and the direction of vocational and technical education development, to determine the implementation and streamlining of vocational and technical institutions, and to plan, draft and evaluate the effectiveness of technical and vocational education. To be more specific, the objectives were to provide opportunities to students who were interested and have special inclinations toward science and technical education: who at the same time could be streamed to become highly technical and skilled workers that were required for nation building. They also aimed to offer more rigorous technology-oriented programs to students who have the potential to become semi-professional workers in various technical and engineering fields. Through these programs, Malaysia would be better able to produce a highly knowledgeable and competent workforce who possess good work ethics and excellent values.

To achieve these objectives, the Department of Technical Education and the Malaysia Government established vocational and technical schools, polytechnics, community colleges, and technical universities around the country. The advance in computer technology provides a promise that technical education programs can achieve the objectives effectively.

Statement of the Problem

The rapid growths in the use of the computer and computer-based technologies during the past two decades have similarly had an impact on the educational system around the world. Knowledge and skills in computer technology have become

progressively more important as instructional tools in schools, and higher educational institutions. The vocational and technical teacher development program becomes an important component in this new delivery system to ensure they can cope with new technologies in preparing students to enter the work place.

The computer has become an important tool for teaching and learning in the Malaysian Educational System. In 1996, the Ministry of Education launched the Smart School (Sekolah Bestari) project to ensure Malaysian students can compete in the global economy. Computer technology was one of the most important instructional technology tools used in this new educational project. Currently, this project has been only directly involved with the subjects of math, science, and language. In the future, the new initiative will also be expanded to all subjects in the Malaysian Educational System which will include vocational and technical education programs. Computers and computer-based technology will become common tools used in teaching and learning in vocational and technical schools. Since the development, Malaysia needs to explore and describe the current competence, the perceived importance and the training needs in computer technology among vocational and technical teachers.

Purpose and Objectives

The purpose of the study was to explore and describe the perceived competencies, importance, and educational needs in computer technology among vocational and technical teachers in Malaysia.

To be more specific, the objectives of this study were to determine:

1. The perceived competence in computer technology possessed by vocational and technical teachers in Malaysia.
2. The perceived importance of the competencies in computer technology possessed by vocational and technical teachers in Malaysia.
3. The perceived needs for the competencies of computer technology education among vocational and technical teachers in Malaysia.
4. The relationship among the selected demographics characteristic of vocational and technical teachers in Malaysia with perceived computer technology educational needs.

Definition of Terms

Perceived competence

The perceived competence of vocational and technical teachers in computer technology was defined as the mean score on 5-point Likert scale statements from vocational and technical teachers. The scale was rated as 1 (none), 2 (very little), 3 (somewhat), 4 (very) and 5 (a great deal). A score above the mean showed that teachers perceived they possessed a higher knowledge in a specific computer technology field (Lu, 2002).

Perceived importance

The perceived importance of vocational and technical teachers of computer technology is defined as a mean score of 5-point Likert scale. Each statement is rated 1

(none), 2 (very little), 3 (somewhat), 4 (very) or 5 (a great deal). The score above the mean of the scale would show that teacher indicates they possessed a high importance on getting knowledge and skill in a specific computer technology field (Lu, 2002).

Educational Needs

A need is the difference between the current level of knowledge and skills and what it should be (Borich,1980). Borich operationally defined educational needs as subtracting the perceived knowledge score from the perceived importance score, and then multiplying the result by the average perceived importance score:

$$\text{Equation: Cal En}=(\text{In}-\text{Co})(\text{Ig})$$

Figure 1: Equation of Educational Need

Cal En=calculated educational need,

Co=perceived competence of the item reported by the respondent,

In=importance of the item reported by the respondent,

Ig=average importance of the item as rated by all the respondents.

Limitation of Study

The study was limited in that it was carried out within and was limited to the geographic region served in Peninsular Malaysia. Inquiry was limited to those technical and vocational teachers within this region. The subjects were selected from technical and vocational schools within the regions. The researcher did not include the vocational and technical teachers in regular high schools and the findings cannot be generalized to them.