UNIVERSITI PUTRA MALAYSIA

FACTORS ASSOCIATED WITH LEARNERS' ATTITUTE TOWARDS LEARNING THROUGH CD-ROM COURSEWARE: A CASE STUDY OF DISCOVERY CENTER, BINARIANG BERHAD

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The innovation in information technology, particularly computers, has enabled a new system to deliver educational, training and learning programs. The development of the programmed courseware is based upon learning theories and principles that have been applied in traditional learning environment. On the other hand, attitude has long been recognized as important prerequisite of learning. The problem here is whether the principles and theories applied in the development of Computer-Based Training coursewares facilitate favourable learning from learners' point of view.

The main purpose of this research is to identify factors associated with learners' attitudes towards Computer-Based Training using CD-ROM Coursewares. Specifically, this research seeks to determine: (i) learners' attitudes towards learning through CD-ROM coursewares; (ii) the relationships between learners' characteristics and learners' attitude toward learning through CD-ROM courseware; and (iii) the relationships between courseware characteristics and learners' attitude towards learning through CD-ROM coursewares.

The respondents were the employees of Binariang Berhad who had taken any CD-ROM courseware at the Discovery Centers of Binariang Berhad and went to any Discovery Center during 27th July to 22nd August 1998. The research instrument was a set of questionnaire.

The results indicate that (i) all respondents have a positive attitude towards the last CD-ROM courseware they had taken. None of the respondents obtained a low score; (ii) learners' characteristics including educational achievement, working experience and attitude towards computers were significantly related to learners' attitude towards learning through CD-ROM courseware. The correlation between attitude towards computers and learners' attitude towards learning through CD-ROM coursewares is high. Working experience showed low relationship with learners' attitude towards CD-ROM coursewares. Educational achievement showed low negative correlation with learners' attitude towards CD-ROM coursewares; (iii) courseware characteristics include interactivity, individualization, textology, multimedia elements, clearly stated objectives, learning experience and immediate feedback were found to be positively related to learners' attitude towards learning through CD-ROM coursewares. The correlation for textology is the highest (r=0.85) compared to correlation of other factors. In conclusion, learning and instructional principles that have been applied in traditional mode of learning have been found to contribute in learners' attitude towards learning through CD-ROM courseware. However, in the context of computer-based learning, the human-computer interface have to be more humanised.

Several recommendations forwarded to the organisation are as follow: (i) identify learners' background in terms of language proficiency, educational qualification

and attitude towards computers while selecting or developing CD-ROM courseware; (ii) incorporate CD-ROM courseware and classroom training to maximize the benefits of CD-ROM courseware and classroom training; (iii) a checklist that is derived from the research instrument recommended for the selection and development of CD-ROM coursewares.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains.

FAKTOR-FAKTOR YANG BERKAITAN DENGAN SIKAP PELAJAR TERHADAP BELAJAR MELALUI PROGRAM CD-ROM: SATU KAJIAN KES TERHADAP DISCOVERY CENTER, BINARIANG BERHAD

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Penciptaan teknologi inforamasi, terutamanya komputer telah melahirkan satu sistem baru untuk penyampaian program-program pendidikan, latihan dan pembelajaran. Perecanaan program courseware adalah berdasarkan teori-teori dan prinsip-prinsip pembelajaran yang selama ini diaplikasikan dalam bidang pembelajaran tradisional. Selain daripada itu, sikap merupakan satu penentuan yang penting dalam pembelajaran. Maka, adakah teori-teori dan prinsip-prinsip yang diaplikasikan dalam program pembelajaran melalui komputer sesuai dengan sikap pembelajaran pelajar?

Tujuan terutama penyelidikan ini adalah untuk memastikan faktor-faktor yang berkaitan dengan sikap pelajar dalam pembelajaran melalui komputer dengan menggunakan program CD-ROM. Secara khas, penyelidikan ini bertujuan menentukan: i) sikap pelajar terhadap belajar melalui program CD-ROM; ii) hubungan antara sifat-sifat pelajar dengan sikap pelajar terhadap belajar melalui program CD-ROM; iii) hubungan antara sifat-sifat program CD-ROM dengan sikap pelajar terhadap belajar melalui program CD-ROM.

Responden penyelidikan ini adalah pekerja-pekerja dari Binariang Berhad yang pernah mengambil khusus dalam bentuk program CD-ROM di mana-mana satu Discovery Center dan telah pergi ke Discovery Center pada jangka masa 27 Julai hingga 22 Ogos 1998.

Hasil kajian menunjukkan : (i) semua responden memperlihatkan sikap yang positif terhadap program CD-ROM terakhir yang diambil. Ini terbukti kerana tiada responden mendapat skor dalam kategori negatif; (ii) sifat-sifat pelajar termasuk "pencapaian pendidikan", "pengalaman bekerja" dan "sikap terhadap komputer" memperlihatkan hubungan yang signifikan dengan sikap pelajar terhadap program CD-ROM. Nilai korelasi antara sikap terhadap komputer dengan sikap pelajar terhadap program CD-ROM adalah tinggi. Manakala, pencapaian pendidikan menunjukkan nilai korelasi negatif dengan sikap pelajar terhadap program CD-ROM; (iii) sifat-sifat program CD-ROM termasuk, "kadar interaksi", "individualisation", "Textology", "element multimedia", "objektif pembelajaran yang jelas", "pengalaman pembelajaran" serta "maklumbalas serta-merta" didapati berkolerasi dengan sikap pelajar terhadap program CD-ROM. Antaranya, nilai kolerasi bagi pembolehubah 'Textology' adalah tertinggi (r=0.85) berbanding dengan faktor-faktor yang lain. Sebagai kesimpulan, prinsip-prinsip pembelajaran yang diaplikasikan dalam pembelajaran tradisional juga berkaitan dengan sikap pelajar terhadap belajar melalui program CD-ROM. Walau bagaimanapun, faktor keperimanusiaan harus dititikberatkan.

Cadangan-cadangan yang dikemukakan untuk organisasi berkenaan ialah: (i) mengenalpasti latar belakang pelajar dari segi pencapaian pendidikan dan sikap terhadap komputer; (ii) mengabungkan program CD-ROM dan cara pelatihan tradisional untuk

memaksimunkan kebaikan kedua-dua cara ini; (iii) satu senarai semakan sebagai panduan untuk perencanaan dan pemilihan program CD-ROM telah dikemukakan berdasarkan keputusan penyelidikan.

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Last but not least, I would not be where I am today in my personal and academic achievement if it was not for the love, understanding, encouragement, patience and support of my beloved husband, Chee P O

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List of Abbreviation

Binariang Bhd.:	Binariang Berhad (Binariang Limited)
CAI:	Computer-Assisted Instruction
CBL:	Computer-Based Learning
CBT:	Computer-Based Training
DC:	Discovery Center
IT:	Information Technology
ITBL:	Information Technology-based Learning
ITBT:	Information Technology-based Training
MSC:	Multimedia Super Corridor

CHAPTER I

INTRODUCTION

Information technology (IT), particularly computer innovation is forcing us to reconsider the learning and training paradigms of the past, in the light of the dynamics of the present and future The innovation of computer has created a new system of delivering educational programs to trainers and learners And as such, we can anticipate a rising trend in computer-aided learning or computer-based training This human-machine interface learning and training trend is cited by Meister (1998) in his study titled "Annual Survey of Corporate University Future Directions" Eighteen percent of modern training is delivered by technology-based By the year 2000, it is estimated that 50% of training program will be technology-based (Industrial Business Machine (IBM), a leading hardware company, used to deliver more than 5% of the company's education programmes in the early 1980s on computers Today that figure stands at 30%, and by the end of the 1990s, IBM estimates that 60% of the company's training programme will be on computers (Phillips, 1991) In Malaysia, Information Technology-Based Training (ITBT) is gaining more attention in the field of human development Binariang Bhd. one of the leading communications companies in Malaysia has intensively employed ITBT using multimedia CD-ROM for staff training and development

The concept of ITBT and computer-based training (CBT) is based on a number of disciplines, primarily centred on science and psychology (Chambers and Sprecher, 1983). Computer science is a child born of mathematics and engineering. From this then emerged the computer and its various programs. Its instructional strategies and motivation are based on psychological learning theories.

In fact, none of the potential benefits of ITBT are inherent but rather they are dependent upon the quality of pre-developed courseware. On the other hand, attitude is also an important predictor of individual differences in educational achievement (Evans, 1965). Attitude is, in fact, a prerequisite of effective learning. Therefore, it is important that factors associated with learners' attitude toward learning through information technology-based courseware be explored to provide a guideline for developing interesting courseware.

A Brief History of Computer-Based Training

The evolution of Computer-based Training (CBT) can be traced back to the late 1950's through early 1970's, where a great deal of effort and enthusiasm were devoted to bring computers and other instructional machine into schools (Maddux, et.al., 1992; Percival and Ellington, 1986). At the beginning it was called "teaching machine".

According to Maddux, et al. (1992), this early activity had its roots in the work of Sidney Pressey. In the 1920's, when Pressey began experimenting with a machine to administer multiple-choice items. He found that "objective tests" were widely used in schools. He then, found that his machine had the potential for teaching besides its capabilities for testing and scoring.

Although Pressey's device generated some interest, it was never widely used. More than thirty years later, the well-known psychologist, B. F. Skinner, was responsible for renewing the interest towards the potential of teaching machines (Maddux, et al., 1992). Skinner's behaviorist approach towards teaching and learning acted as a catalyst in the development of individualised instructional programme or programmed instruction in the 1950's (Maddux, et al., 1992; Romiszowski 1986).

Programmed instruction texts contain questions and answers to direct the learner through the lessons. The path the learner takes through a programmed text (i.e. see different pages) will depend upon the answer the learner selects. While programmed instruction is theoretically a good way to improve the effectiveness of the print media, in practice it proved to be too cumbersome for students to use. However, the basic ideas of programmed instruction formed the basis for CBT (Kearsley, 1985).

According to Maddux, et al. (1992) Skinner's machine presented questions in thirty radial frames on a 12-inch disk. His programmes were linear as they led each learner through the same material in the same sequence. Later, Norman Crowder (cited in Maddux, et al., 1992) endorsed Skinner's ideas, but he did not agree that every learner should progress through each lesson in the same sequence of frames. He presented only certain frames to some learners while omitting these for others, depending on the learners' responses. Such programs were called branching programs. These pilot programs of CBT emphasised on individualisation and flexibility.

In short, CBT was initiated in the late 1950's and 1960's. Its initiations were closely related to formal education. Due to the innovation of cheaper and more advanced microcomputer in 1978 through 1981, the used of computers to deliver

training and learning program in business and industry grew substantially (Kearsley, et al. 1981). As computer technology has steadily become advanced in the 90's, it can be assumed that the use of computers in delivering training and learning programs has increased.

Computer-Based Training in Malaysia

In Malaysia, information technology (IT) is making a profound impact in our lives. In the field of learning and training, computer-based training (CBT) provides an alternative delivery mode to conventional modes. There are various forms of Information Technology-Based Training (ITBT). They include the use of audio-visual videotapes, multimedia CD-ROM, intranet-based and internet-based programmes. Malaysia is investing heavily in multimedia CD-ROM training programs.

Although pioneer efforts of computer-assisted instruction (CAI) and computer-based training (CBT) have evolved in United Kingdom and United State of America since the 1960's, they are still considered new concept in training in Malaysia. However, it is found that Industrial Business Machine (IBM) has already used CBT courseware for its staff training here since 1980's. The training coursewares were provided by their Regional Headquarters in United States. This information was obtained through personal interview with Ulti-Tech's Director. The first local company to use CBT intensively is Malaysia Airline System Berhad (MAS). According to MAS Public Relation personnel during an interview session, MAS has intensively used CBT and simulation machine for its pilots since late 1980's. On July 25th 1996, Binariang Berhad established its first learning centre called the Discovery

Center (DC) This centre is fully utilised CBT using CD-ROM courseware and disk Over 160 courses were delivered through CBT (disk and multimedia CD-ROM) (DC Document, 1998) Until mid 1998, Binariang Berhad had established four DCs for its staff development

Other business organisations in Malaysia that employed CBT are Petronas Carigali in Miri and Andersen Consulting Sdn Bhd According to the Director of Ulti-Tech Sdn Bhd (a multimedia CD-ROM courseware provider), their statistic shows that there are approximately twenty companies in the Klang Valley that employ multimedia CBT These companies are mostly bank and large manufacturing companies that are involved in high technology

Besides business organisations, individual use of ITBT, particularly multimedia CD-ROM courseware for learning has also become more popular This can be justified by the availability of CD-ROM courseware on the shelf and the increase in the sales of personal computer from year to year Undoubtedly, CBT is likely to see potent growth the near future This assumption can be attributed to various factors which will be discussed here

Vision 2020

The first attribute that influence the future of computer-based training (CBT) is closely related to our nation's move towards a fully developed, matured and knowledge-rich society by the year 2020 As a strategy to achieve this vision, Malaysia has embarked on an ambitious plan to leapfrog into the Information Age with the creation of Multimedia Super Corridor (MSC) To head the development of the MSC

and to give shape to its environment, seven primary areas for multimedia applications have been identified. These seven Flagship applications aspire to transform core elements of Malaysia's technology infrastructure and social systems in areas such as education and public administration. The "Smart Schools" project is one of these applications. Learning through computers, either in the form of Computer-Assisted Instruction (CAI) with multimedia CD-ROM or via Internet, will become an important learning mode in a Smart School. Here, we can foresee the future use of CAI in schools (MSC, 1997).

Vision 2020 envisages the creation of a 'Masyarakat Madani' or Civil Society as its ultimate goal. To facilitate this notion, one of the targets of "National IT Agenda" (set by National IT Council) is that "All Malaysians will have access to information and learning through 'infostucture' for personal, organisational and national advancement". This objective coupled with the effort of the government in promoting computer technology will surely result in the use of information technology, especially computers as a learning and training delivery tool.

In its effort to achieve a developed country status, one of the strategies undertaken by the government involves the development of the country's most important asset – its human resource. This has resulted in an increasing need for training. With the rising cost of face-to-face learning (in terms of time and money), many companies in Malaysia will view CBT as an alternative mode for accelerating learning and training opportunities among their staff.

The need for computer-based training (CBT) in Malaysia is echoed in the speech of Datuk Dr. Tengku Azman Shariffadeen, President and Chief Executive

Officer of Mimos Bhd when he said "as the country progresses towards becoming a developed nation, it can no longer rely on traditional learning and training methods to take it into the era of an information and knowledge-based society Instead, new learning and training systems need to be developed to meet the country's needs in creating such a society" (New Straits Times, July 21, 1997) at the seminar titled *Toward the Millenium Technology, Education and Knowledge Society* He added that "infromation tecnology has been identified as the means to transport the country from being an industrialised nation to a knowledge-based society"

The notion of Malaysia being an information technology (IT) society has created for itself the need for quality adult educational programs This, in turn, has created a need for quality learning tools to cater to individuals and organisations With the advent of IT, training through computer will become more popular

Availability of Computers

The advent of information technology (IT), particularly computer technology, has made individualised training possible As computer technology improved, its speed, memory, power and other multimedia functions have improved too Consequently, there is real potential for more effectiveness computer-based training (CBT) programs Today, computer are used not only for word-processing, but they are also used to create whole new virtual worlds and real experiences for learners The computer is used not only to play back pre-recorded information, as does a VCR, but also to create in real time images, sounds, scenarios and actions (Layte and Ravet,