UNIVERSITI PUTRA MALAYSIA

THE EFFECT OF COMPUTER-BASED MUSIC EDUCATION SOFTWARE ON THE IDENTIFICATION OF NOTE-NAMES

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Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirement for the Degree of Master of Science

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Chairman : Chan Cheong Jan, D. Lit.

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This study investigated the effect of computer-based music education software application on the identification of note-names. The study sought to ascertain the achievement of non-music major trainee teachers on the learning of note-names and their attitudes towards learning music in general. A randomized posttest-only control group experimental design was used in this investigation.

The sample consisted of 62 semester 1 trainee teachers who were studying in a music elective class at a teacher training college. The trainee teachers were divided into two equal groups and both the groups completed a 12-hour course. The first group comprised 31 trainee teachers who made up the control group that received instructions from a lecturer. The remaining 31 trainee teachers formed the second group that learnt the same content using

computer-based music education software comprising Music Ace, A Musical Tutorial 2.0 and Musical Space Invaders v1.0. The activities planned in the course were parallel for both groups in terms of content and time allocation for each topic.

Four research instruments were used to collect data at the end of the course. The ability on note-names identification was evaluated in three methods: Recognition of Note-Names on the Staff Test (RNNS), Keyboard Matching of Note-Names Test (KMNN) and Keyboard Sight Reading Test (KSRT). A questionnaire was administrated to generate data required to look into the attitude of the trainee teachers toward the learning of music in general.

Findings in this study evidently revealed positive effects of computer-based music education software application in the teaching of reading note-names. The overall result from the Recognition of Note-Names on the Staff Test [$t(60)=3.20$, $p=.002$], Keyboard Matching of Note-Names Test [$t(60)=5.69$, $p=.000$] and Keyboard Sight Reading Test favouring computer application was reported. However, when subsections were analysed, *t*-test results in Recognition of Note-Names on the Staff Test of one note-name and two note-names showed no difference in the achievement tests. As for other subsections in Recognition of Note-Names on the Staff Test and Keyboard Matching

of Note-Names Test, significant differences favouring the computer-based music education group were reported. The mean difference of each subsection for both tests increased in value as the difficulty level of the test increased. Results from the Keyboard Sight Reading Test revealed that trainee teachers from both groups performed equally well in the note accuracy test but the time taken by the computer-based music education group to complete all the exercises on the keyboard was shorter than the control group. Findings from the study revealed that the ability to read note-names in a faster speed may be increased with the support of computer-based music education software.

Analysis of the Attitude towards Learning Music Questionnaire revealed that majority of the trainee teachers had positive attitudes towards music as a subject in this study though there was significant difference statistically in the *t* test result. The result $t(60)=0.251$, $p=.039$ obtained was statistically significant at .05 level.

Evidently, the results of this study indicated that a wider usage of computer-based music education software in the Malaysian context would bring positive results in trainee teachers' achievement levels and interest.

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

KESAN PERISIAN KOMPUTER PENDIDIKAN MUZIK DALAM IDENTIFIKASI NAMA NOTASI

Oleh

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Kesan pengaplikasian perisian komputer pendidikan muzik dalam identifikasi nama notasi dikaji melalui rekabentuk eksperimental "*randomized posttest-only control group*". Kajian ini meneliti pencapaian dalam pembelajaran nama notasi dan sikap guru pelatih terhadap pembelajaran muzik secara am.

Sample kajian terdiri dari 62 orang guru pelatih bukan major muzik yang berkursus elektif muzik dari sebuah maktab perguruan. Satu rawatan sepanjang 12 jam dilaksanakan kepada 31 guru pelatih dari kumpulan kawalan yang menerima rawatan dari pensyarah secara kuliah dan 31 guru pelatih lagi dari kumpulan perisian komputer pendidikan muzik yang menerima kandungan rawatan yang sama dengan menggunakan perisian komputer pendidikan muzik *(Music Ace, A Musical Tutorial 2.0, Musical Space Invaders v1.0)*. Aktiviti-

aktiviti yang dirancang iaitu kandungan and peruntukan masa untuk setiap topik dikendalikan secara selari.

Empat instrumen kajian diguna untuk mengumpul data di akhir kajian ini. Keupayaan guru pelatih mengenal notasi di uji melalui tiga kaedah: Ujian Bacaan Notasi dalam Baluk (RNNS), Ujian Memadan Notasi dengan Kibod (KMNN) dan Ujian Bacaan Semerta Kibod. Satu Soal Selidik Sikap Terhadap Pembelajaran Muzik dilaksanakan untuk mengumpul data berkaitan sikap guru pelatih terhadap pembelajaran muzik secara am.

Keputusan keseluruhan dari Ujian Bacaan Notasi dalam Baluk [$t(60)=3.20$, $p=.002$], Ujian Memadan Notasi dengan Kibod [$t(60)=5.69$, $p=.000$], dan Ujian Bacaan Semerta Kibod menyokong pengaplikasian komputer dilaporkan. Analisis subujian Pengenalan Notasi dalam Baluk untuk satu not dan dua not pula tidak menunjukkan perbezaan signifikan. Untuk subujian yang seterusnya dalam Ujian Bacaan Notasi dalam Baluk dan Ujian Memadan Notasi dengan Kibod, perbezaan signifikan dilapor menyokong kumpulan perisian komputer pendidikan muzik. Nilai perbezaan min untuk kedua-dua ujian ini meningkat apabila tahap kesukaran ujian meningkat. Keputusan dari Ujian Bacaan Semerta Kibod pula menunjukkan persembahan guru pelatih dari kedua-dua kumpulan adalah setaraf

tetapi masa yang diambil oleh kumpulan eksperimen untuk memainkan semua latihan kibod adalah lebih pendik dibandingkan dengan kumpulan kawalan. Dapatan kajian menunjukkan keupayaan membaca notasi dengan kelajuan yang lebih cepat mungkin dapat dipertingkatkan dengan sokongan dari perisian komputer pendidikan muzik.

Dapatan dari soal selidik Sikap Terhadap Pembelajaran Muzik menunjukkan majoriti guru pelatih bersikap positif terhadap kelas muzik walaupun keputusan menunjukkan terdapat perbezaan yang signifikan. Keputusan $t(60)=0.251$, $p=.039$ menunjukkan signifikan secara statistik pada aras .05.

Dengan ini, keputusan kajian menunjukkan penggunaan perisian komputer pendidikan muzik secara meluas dalam kontek Malaysia boleh membawa kesan yang positif dalam pencapaian dan minat guru pelatih maktab perguruan.

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I certify that an Examination Committee met on 1st June 2004 to conduct the final examination of Lim Zek Chew on her Master of Science thesis entitled "The Effect of Computer-based Music Education Software on the Identification of Note-names" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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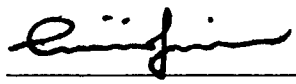

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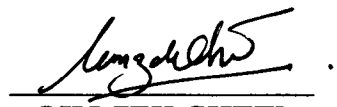
DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Putra Malaysia or other institutions.



LIM ZEK CHEW

Date: 19 Julai, 2004

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LIST OF ABBREVIATIONS

BASIC	Beginner's All-purpose Symbolic Instruction Code
BPG	*Bahagian Pendidikan Guru* [Teacher Education Division]
CAI	Computer Assisted Instruction
CBME	Computer Based Music Education
CD-ROM	Compact Disc-Read Only Memory
GUI	Graphical User Interface
GUIDO	Graded Units for Interactive Dictation Operations
KBSR	*Kurikulum Bersepadu Sekolah Rendah* [Integrated Primary School Curriculum]
KDPM	*Kursus Diploma Perguruan Malaysia* [Malaysian Diploma in Teaching]
KMNN	Keyboard Matching of Note-Names Test
KSRT	Keyboard Sight Reading Test
MENC	Music Educators National Conference
MIDI	Musical Instrument Digital Interface
NASM	National Association of Schools of Music
PLATO	Programmed Logic for Automatic Teaching Operations
RNNS	Recognition of Note-Names on the Staff Test
SPSS	Statistical Package for Social Studies
UPM	*Universiti Putra Malaysia*

CHAPTER 1

INTRODUCTION

The National Vision Policy which is the second phase of Vision 2020, recently unveiled by Dato' Seri Dr. Mahathir Mohammad the Prime Minister of Malaysia, during the 8th Malaysia Plan, is geared towards developing a knowledge-based economy (The Star, 4 April 01). This is to initiate a technology-literate workforce who can use Information Age tools and technology to improve productivity. It is stated in the next 10-year development plan that there will be more investment in education with the expectation that more subjects will be taught using interactive multimedia technology and web-based teaching. It is anticipated that by the year 2010, the majority of schools will be linked to each other through Intranet and the Internet. Therefore, it is hoped that all teachers will also be equipped with information technology knowledge to enable them to design their teaching materials using information and communication technology.

The focus on technology in higher education in the west began in the 1950s. The focus on technology in music education was seen only much later in the 1970s where the use of software designed to teach, tutor, drill, query or sequence a student's learning had been available

in music (Higgins, 1992). Most of the software was developed on university and college campuses for university or college courses (Peters, n.d.). The importance and relevance of incorporating technology into the music education curriculum from elementary school through university levels have been stressed by the Music Educators National Conference (MENC, 1999) and the National Association of Schools of Music (NASM, 2001). In 1999, the committee of MENC published Opportunity-to-Learn Standards for Music Technology (Pan, 2001) because they felt that the ways schools deliver music instruction influenced by new technologies. Specified outlines and guides for curriculum, staffing, equipment, materials, software and facilities for music education technology was provided to ensure excellent implementation of the new standards.

The focus on technology in the Malaysian Education System began to get serious attention during the implementation of the Smart School flagship under the Multimedia Super Corridor as one of the applications introduced (Ministry of Education, Malaysia, 1997). It is hoped that through Smart School, a new generation of more creative and more innovative thinkers would emerge.

In July 2001, a guideline on how to incorporate information and communication technology into the teaching and learning of music

was introduced by the Malaysian Curriculum Development Center, to all teachers in the secondary and primary schools (Ministry of Education, Malaysia, 2001). Preparations were made to assist teachers to accomplish this vision. Instructions and samples of teaching lessons on how to integrate information and communication technology into the teaching and learning of music in the classroom for primary schools were carefully planned.

Music technology is a growing part of the information and multimedia revolution that is fueled by computer technology. Electronic keyboards, music software, synthesizers, CD-ROMs and computers are tools that can greatly aid music students and trainee teachers in performing, improvising, composing, reading and notating music (Bissell, 1998, Lehman, 2002). In recent years, there has been an increasing interest in the application of information and communication technology such as the use of computer for instructional purpose. Instructional software such as tutorial software which can deliver instructions and support learning activities has become more interactive, colorful and motivating now. Hence, it is timely that teacher educators should focus on improving teaching and learning through technology.

Music trainee teachers in all teacher training colleges in Malaysia were required to learn to play the electronic keyboard which was a new instrument introduced into the Malaysian Diploma in Teaching or better known as the "Kursus Diploma Perguruan Malaysia (KDPM) 1996". The requirement of the syllabus was just basic keyboard playing without MIDI (Musical Instrument Digital Interface). As for the Technology in Music Education component in the KDPM music syllabus, there was no section that required trainee teachers to learn about computer music software. The visibility of computer technology in music education for teacher training colleges began in 2001 where software application was the new section introduced into the Technology in Music Education component in the music syllabus (KPDM Syllabus, 2001). With the availability of electronic keyboards, computers and MIDI devices, it is now possible for every student to create, perform, listen to and analyse music to an extent previously unattainable.

The KDPM Music Studies Elective (Pre-School)

The Music Studies as an elective subject offered within the Pre-School course in teacher training colleges provide training for trainee teachers to acquire specialized music skills. The objective of the Music Studies for pre-school trainee teachers is to provide basic music

knowledge and teaching skills so that they will be able to implement the Integrated Primary School Curriculum or *Kurikulum Bersepadu Sekolah Rendah* (KBSR) Music Education Program in the primary school level. Music rudiment is one of the fields required by the Music Studies Curriculum where trainee teachers are expected to have pitch recognition, note reading, rhythm, key-signature, and harmony knowledge. In semester 1 there are 15 hours of music lessons where students receive 1 hour of music lessons per week. The reading of music notation is planned in the first semester with an allocation of 4 hours of interaction. As for the playing of instruments component, an allocation of 11 hours of interaction is planned for the learning of keyboard playing (refer to Appendix B1).

	Components	**Hours**	**Credits**
1.	Music Rudiments	15	1
2.	Singing	30	2
3.	Playing of instruments (percussion, keyboard and melodian)	30	2
4.	Appreciation and creative movement	45	3
5.	Pedagogy	15	1
6.	Music methods in other subjects	15	1
	Total	**135**	**9**

Table 1: Components of the Pre-School KDPM Music Studies Elective Syllabus

The recommendation of pedagogical aspects in teaching the rudiment of music was clearly written in the pre-school KDPM music studies