

Documenting and Advocating Tumbuk Kalang Ensemble for Sustainability and Heritage

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Tumbuk Kalang ensemble is a genre of music that has its own historical background and performance pattern. This research was undertaken in order to understand the music culture and the art of Malay ensemble, and in particularly the art of Tumbuk Kalang ensemble in Negeri Sembilan. It is a form of culture that is learned by Malay Negeri Sembilan people and handed down from generation to generation and occurs in informal or non-formal ways of learning. However, it has gradually begun to disappear as the people's behavior has changed due to changes in society over time. Therefore, this research studied both the technical and aesthetics aspects of Tumbuk Kalang ensemble that have been structured with knowledge of music education and developed as an interactive multimedia courseware that been incorporated into the teaching and learning in formal educational institutions. This research involved both qualitative and quantitative methodology and utilized questionnaires and semi structured interviews for the data collection that was examined by descriptive-analytic approach. An interactive multimedia product for teaching and learning Tumbuk Kalang was developed and evaluated in terms of its suitability and sustainability in formal higher educational institution setting. The findings from teachers, trainers and student feedback show that the developed teaching and learning materials demonstrate high levels of usability and suitability as teaching materials and learning of the Negeri Sembilan Tumbuk Kalang music ensemble at formal educational institutions.

Key words: *Tumbuk Kalang, Musical culture, Heritage, Interactive multimedia, Informal education, Non-formal education.*



Introduction

This ongoing research is highly relevant to the government policy which is to preserve our national cultural heritage. In order to achieve this notion, one strategy is to make all citizens, especially the younger generations, understand and appreciate the culture of the ethnic group in Negeri Sembilan, Malaysia. The result of this research can strongly contribute to the continuity and better understanding of the local culture of Malaysian worldwide and in promoting Malaysia as an attractive tourism product

Background of the Study

In the Ninth Malaysian Plan, the National Heritage Act 2005 (hereinafter referred to as the NHA 2005) was enacted to give protection to and preserve various tangible and intangible cultural heritage. Musical culture is a very significant identity and valuable heritage for any group of people which should be preserved for nationhood. The incursion of western popular music over five decades has caused the traditional musical ensemble "Tumbuk Kalang" in Negeri Sembilan, Malaysia to slowly fade out of practices among the current generation. The purpose of this research was to document and advocate the "Tumbuk Kalang" inclusion in co-curricular activities in Malaysian secondary schools.

Problem statement

The public has a role in preserving Malaysia's cultural. As a person who is responsible in preserving and sustaining the musical cultural heritage, the researcher must work to research, document and advocate our national heritage. Sustainability focuses on meeting current human needs without compromising the ability of future generations to meet their own needs (Hye & Siddiqui, 2010; Corbett, 2012). There is a critical need to reinforce Malaysian attentiveness to "Tumbuk Kalang" ensemble as cultural and musical tradition. Malaysia has continued to pursue growth in politics, economics, education, and culture under the watchword of internationalization. This slogan fosters a genuine sense of world unity among nations and people. At the same time, it cultivates a counter-movement in Malay and elsewhere that calls for a strengthened national and cultural identity. It is thought that the development by Malaysians of knowledge of their culture is as important as cultivation of their awareness of people across the globe. Currently, many areas of national heritage and culture including "Tumbuk Kalang" have not been properly documented, this research can fulfil the need for this. A combination of documenting and advocating activities that support sustainability are needed to meet this goal. High value needs to be placed on social and cultural capital (Maniates, 2010). Strengthening the capital in our varsity community will build the foundation on which sustainability is empowered as students identify with their culture and sense of place.

Research questions

The underlying intent of this study is to document the traditional musical ensemble Tumbuk Kalang practices among the people in several district of Negeri Sembilan. The four main objectives of this study are as follows:

1. To collect and document the gradually disappearing traditional musical ensemble Tumbuk Kalang practices among the people in Negeri Sembilan.
2. To analyze the collected musical elements of ensemble Tumbuk Kalang
3. To analyze both the technical and aesthetics aspects of "Tumbuk Kalang" that can be incorporated into teaching and learning in co-curricular activities
4. To produce materials and resources such as interactive multimedia courseware, auditory (CDs), written (Musical notation/Songbook) and video for the teaching and learning of "Tumbuk Kalang" for Malaysian secondary schools

In this research, areas of historical background and function, musical analysis and both the technical and aesthetics aspects of "Tumbuk Kalang" that can be incorporated into the teaching and learning in co-curricular activities in Malaysia secondary schools will be the focus. The specific research questions are:

1. What are the technical and aesthetic aspects of "Tumbuk Kalang" that can be incorporated into the teaching and learning activities?
2. What is the musical analysis of "Tumbuk Kalang" in term of:
 - musical characteristics
 - scale is each music based
 - range/key/meter
 - typical form
3. What are the optimal designs and materials for teaching and learning "Tumbuk Kalang" in co-curricular activity for selected Malaysia secondary schools?
 - i. The interactive multimedia courseware
 - ii. The songbook with musical notation.
 - iii. The audio CD
 - iii. The DVD video
4. How successful are teachers in teaching "Tumbuk Kalang" ensemble in co-curricular activity for selected Malaysia secondary schools?

Sustainability of Tumbuk Kalang

The Tumbuk Kalang ia a type of traditional music which originated from Negeri Sembilan. The instruments used in this musical display are mortar and pestle (tumbuk lesung), rebana and gong. The Tumbuk Kalang which is also known as tumbuk lesung is usually performed at night after the end of the harvesting season. During the night, the work of pounding young



green rice (emping) is celebrated. Besides this, the Tumbuk Kalang is also performed during wedding or welcoming parties for rulers. Tumbuk Kalang is one aspect of musical culture that has a very significant national identity and valuable heritage for Malaysia and which should be preserved.

Cultural heritage is important for various reasons; it has a positive economic and social impact, it establishes and reinforces identity, it helps preserve the cultural heritage, with culture as an instrument, it facilitates harmony and understanding among people and it supports culture and helps renew tourism (Richard, 2006) According to Norhasimah, Tarmiji and Azizul (2014), cultural heritage is traveling to experience the places and activities that authentically represent the stories and people of the past and present, which include historic, cultural and natural attractions. Cultural Heritage is an appearance of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects and artistic expressions.

The theory of sustainability introduced by philosopher Brian Barry (1997) argues that preservation of some opportunities for future generations requires the enduring existence of particular ecological goods. Aligned with this research, the opportunity to decide whether or not Tumbuk Kalang is required for a decent human life depends on their preserved existence. This approach electively proposes that we must sustain conditions for the ongoing effort. Sustainability requires humans to recognize the simple facts of the cultural existence and thus it can provoke reflection on our dearest values and fundamental beliefs on that particular culture. Based on this theory, to meet the challenges of sustainability in this twenty-first century, individuals and communities must seek ways in which to explore the spirit of sustainability.

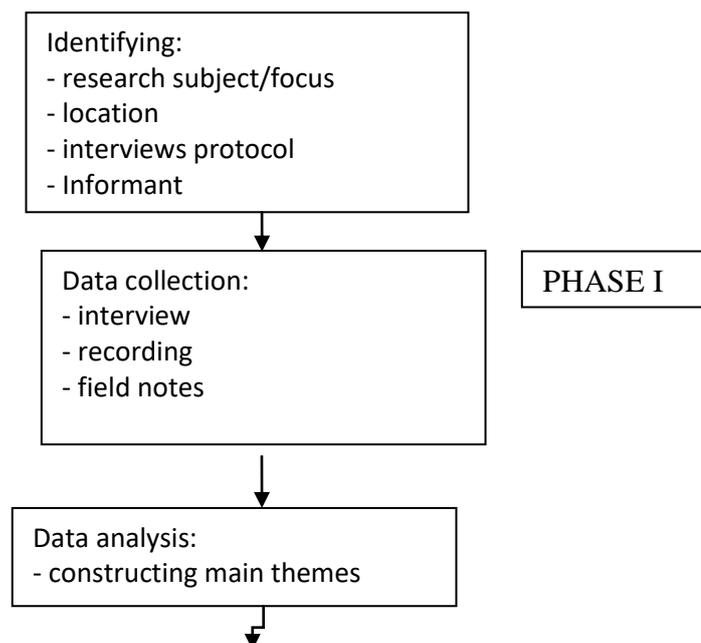
Methodology

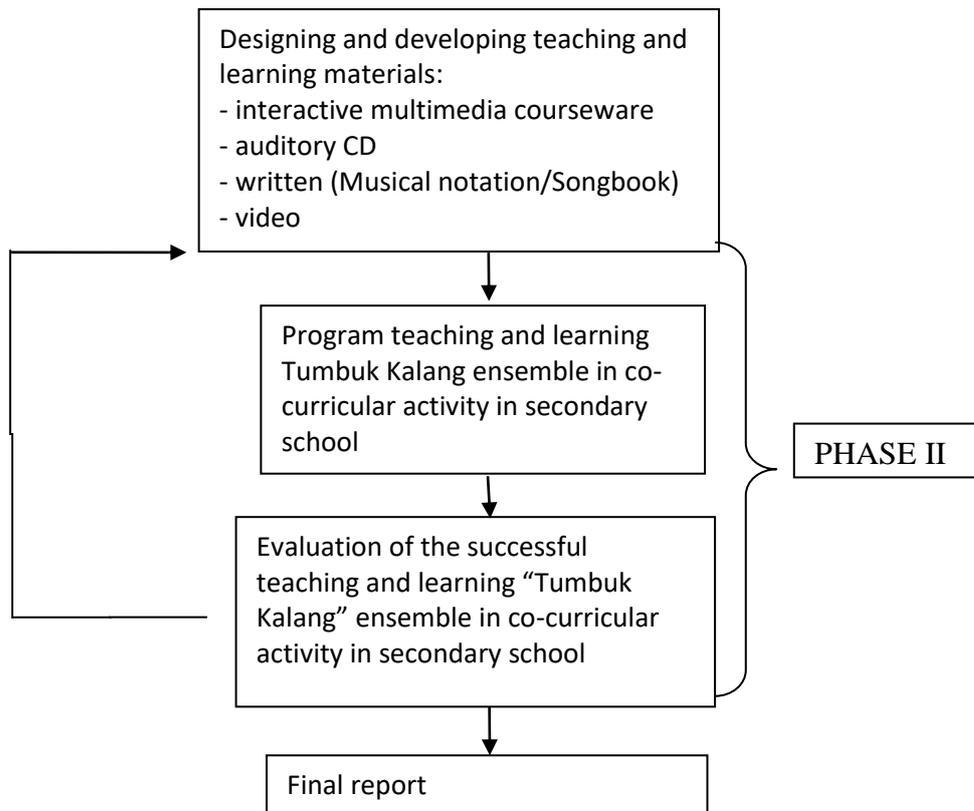
In general, this research will be conducted in two phases. In the first phase, in order to induce the musical content as well as context of the informants, ethno musicological research approaches will be employed (Frankle & Wallen, 1993). Research method includes ethnographic fieldwork techniques including individual open and structured interviews, audio and video recordings, and field notes that will be taken with the informants, following transcription. The content analysis will be selected for description through musicological analysis (Fontana & Frey, 1994). The musical practices and the performers are deemed to be important to gather primary data as well as secondary data from armchair research. A collection of data will be recorded in natural setting – the identified place is where the Tumbuk Kalang ensemble group still performed. Mainly, a few villages in Negeri Sembilan districts will be visited by the researchers for data collection.

The collected data will then be brought back to be transcribed and analyzed using musicological analysis method. The recorded materials from the field will be re-recorded professionally in a recording studio. The data analysis will also include searching for technical aspects, aesthetic, sourcing, transcribing and arranging of Tumbuk Kalang music which is to be included in forthcoming co-curriculum design.

In the second phase, findings of the research fieldwork will be structured into an interactive multimedia courseware of teaching and learning Tumbuk Kalang as a co-curriculum activity for formal institution settings. Therefore, other outcomes of this research will be the production of materials and resources such as auditory (CDs), written (Musical notation/Songsbook) and video for the teaching and learning "Tumbuk Kalang" for Malaysia secondary schools. Further, training sessions for the current music teachers will take place in selected secondary schools which comprise each identified zone: i. Perlis (Utara), Terengganu (Pantai Timur), Negeri Sembilan (Tengah), Johor (Selatan), Kuching (Sarawak) and Tawau (Sabah). Next, a qualitative approach whereby the researchers will evaluate the successful teaching and learning "Tumbuk Kalang" ensemble in co-curricular activity and carry out necessary changes before moving forward with the final report of the research will be conducted.

Overall, the procedures for this study were divided into six phases, each specifically structured to address the research questions. The overall research process was as designed below:





Developing an interactive multimedia material for teaching and learning Tumbuk Kalang was an innovative process. The chosen graphics and layout design model will be considered the goals, context, visual approach, communication functions, and principles of the respective instructional events (Clark and Lyons, 2011; Hallunovi & Berdo, 2018). Clark and Lyons added that, because the interactive material is a highly visual medium, the major design consideration was to direct students' attention toward information that advanced instructional goals while eliminating distractions and avoiding the activation of inappropriate prior knowledge. In terms of incorporating aesthetic value for teaching and learning Tumbuk Kalang, the process for developing performance-based training includes the following 10 steps as outlined by Triola (2017). The first four steps constitute the task analysis that is necessary to design and develop relevant, useful training materials. Steps 5–10 constitute the design and development process.

1. Define the target student for training.
2. List the tasks to be performed by the target students.
3. List the skills and knowledge needed to complete the tasks.
4. Select the skills and knowledge to be taught.
5. Organize the selected skills and knowledge into suitable teaching units (modules) and develop the training design (including brief outlines of module content and planned training methods).

6. Draft expanded outlines of modules, including instructional objectives, main body of text, and descriptions of training methods, examples and exercises.
7. Provide realistic examples and information for use in exercises.
8. Draft the complete modules, facilitator guidelines, and course director guidelines.
9. Field-test the training materials (Data from experts and students).
10. Revise and finalize training materials based on the field test.

Data analysis

The primary methodology supporting this research is qualitative with minor quantitative elements. The feedback for the prototype interactive multimedia material was initially from the specialist music educators who evaluated by answering the questionnaire after the trial period. They also (through their experience with other methods) compare the material with others that are currently in use across Malaysia. The data was compiled and analyzed to evaluate the suitability of the product. Based on the feedback, changes and improvement were made before finalizing the design of the product.

Result of Study

The research was conducted to explore materials, design and test interactive instructional materials for the learning of Tumbuk Kalang music ensemble for the use of teachers and students in selected schools. Prior to implementing the material at the study site, the responses and feedback made by the experts in the field of music education technology on suitability as teaching and learning materials were also incorporated into design. In fact, the display in this section leads to answers to the following research questions.

What are the main elements contained in the Negeri Sembilan Tumbuk Kalang music ensemble?

The purpose of this study is to examine the aspects that can be taken into account in the teaching and learning process of informal music ensemble Tumbuk Kalang Negeri Sembilan which is then structured into the form of teaching materials that will be used in formal educational institutions. This research assessment obtained data on musical techniques and local expressions and terms used by the traditional practitioner and integrated with formal education methods and approaches.

Based on the study procedures outlined in the determination of the required contents of the main elements contained in the Negeri Sembilan Tumbuk Kalang music ensemble which were included in this interactive application was done in Phase 1 Step 6. To meet the needs data in this aspect, the researcher has completed the following:

- i. Interview with Tumbuk Kalang's ensemble consisting of leaders, players and singers.
- ii. Interview with Negeri Sembilan JKKN officer
- iii. Newspaper cutting
- iv. Training observation
- v. Audio material

As a result of the research using the above sources, the researchers identified several topics that focus on the mastery of the Tumbuk Kalang music ensemble. Based on the justification and analysis of the requirements that have been referred to through the various sources as mentioned above, several key units and topics have been structured to incorporate interactive instructional designs which are the key elements contained in the Negeri Sembilan Tumbuk Kalang music ensemble as below.

Table 1: Selected Unit and Topics

Unit	Topic
Unit 1	Introduction
Unit 2	Instrument of Tumbuk Kalang
Unit 3	Technic on Tumbuk Kalang
Unit 4	Sri Jelebu Performing Group
Unit 5	Songs (Video, lyric and music score)
Unit 6	Songs (Audio)
Unit 7	Education Element in Tumbuk Kalang Ensemble
Unit 8	Info

Based on the predefined topics, the researchers outlined the general learning outcomes for interactive teaching and learning that focus on the mastery of the Tumbuk Kalang music ensemble. In general, this interactive teaching and learning can help students to (a) identify the concept of the Negeri Sembilan Tumbuk Kalang music ensemble, (b) identify songs, (c) identify game techniques and (d) tools used.

In more detail, smaller sub-topics are drawn based on the key topics that have been identified. For each of these subtopics, researchers outlined the specific learning outcomes that were to be achieved at the end of the learning using purpose designed interactive multimedia learning materials. The following is a table of topic divisions, subtopics and learning outcomes.

Table 2: Learning Outcomes

Topic	Sub-topic	Learning outcomes
Unit 1: Introduction	<ol style="list-style-type: none"> 1. Mengenal asal-usul 2. Tujuan dan tempat permainan 3. Pemain 	<ol style="list-style-type: none"> 1. Identify the history of the formation of the Tumbuk Kalang ensemble 2. Declare the purpose and place of the Tumbuk Kalang presentation 3. Identify player and function of ensemble Tumbuk Kalang ensemble music
Unit 2: Instrumentation	<ol style="list-style-type: none"> 1. Lesung, alu dan tepak 2. Rebana 3. Gendang 4. Gong 5. Gereteh (Caklempong) 6. Seruling 	<ol style="list-style-type: none"> 1. Name the equipment played in the performance of the Tumbuk Kalang ensemble 2. Declare the function of equipment in the ensemble
Unit 3: Playing Techniques and Rhythm	<ol style="list-style-type: none"> 1. Kambing Berlaga 2. Membolong 3. Inang 4. Joget 	<ol style="list-style-type: none"> 1. Identify playing Techniques and rhythm that are played in the Tumbuk Kalang ensemble 2. Playing Techniques and Beats
Unit 4: Kumpulan Sri Jelebu	<ol style="list-style-type: none"> 1. Ahli 2. Pencapaian 3. Persembahan 	<ol style="list-style-type: none"> 1. Identify examples of the active group Tumbuk Kalang music ensemble
Unit 5: Songs (Video, lyric and music score)	<ol style="list-style-type: none"> 1. Budu Landai 2. Anak Bocek 3. Tak Tun Tun 4. Ayam Den Lapeh 5. Empat Dara 6. Asal Kapas 7. Si Ujang 8. Cantik Manis 9. Padi 10. Kelok Sembilan 11. Bunga Hati 12. Joget Anak Dagang 13. Memikat Hati 14. Mudek Arau 15. Never On Sunday 	<ol style="list-style-type: none"> 1. Identify the songs of the Tumbuk Kalang ensemble 2. Playing the songs of the Tumbuk Kalang ensemble

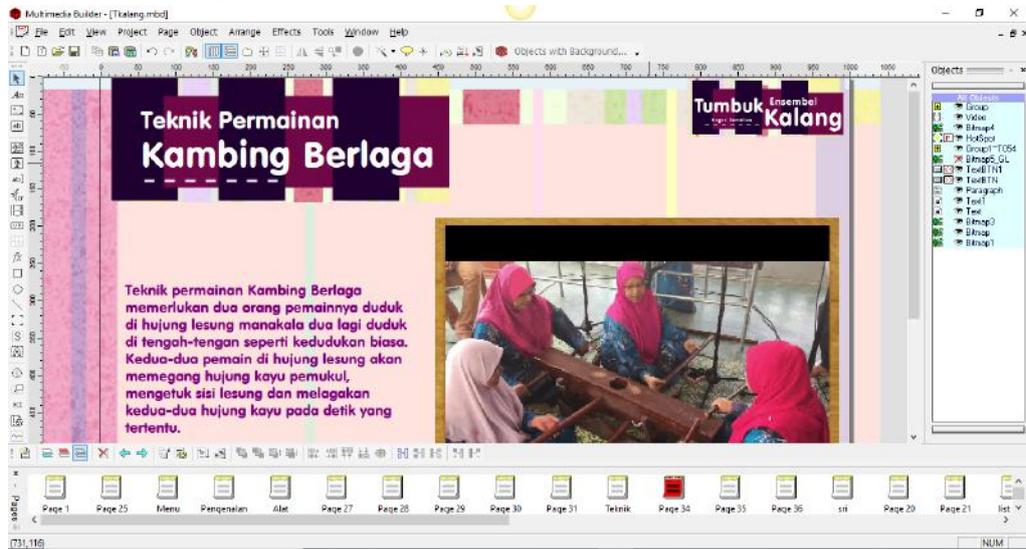
Unit 6: Songs (Audio)	<ol style="list-style-type: none"> 1. Lagu pembukaan 2. Anak Bocek 3. Tak Tun Tun Cantik Manis 4. Pisang Rondah 5. Lenggang-lenggang 6. Instrumental 1 7. Instrumental 2 8. Instrumental Joget 9. Mudek Arau 	<ol style="list-style-type: none"> 1. Identify the songs of the Tumbuk Kalang ensemble 2. Playing the songs of the Tumbuk Kalang ensemble
Unit 7: Education Element in Tumbuk Kalang Ensemble	<ol style="list-style-type: none"> 1. Educational Value 	<ol style="list-style-type: none"> 1. Identify and discuss the educational values in the Tumbuk Kalang ensemble.

How to design interactive multimedia teaching and learning materials of the Negeri Sembilan Tumbuk Kalang music ensemble for use in formal institutions?

Based on the details of the topics and learning outcomes outlined, one instructional design that is systematically used to produce interactive multimedia digital learning materials for the learning of the Negeri Sembilan Tumbuk Kalang music was developed. This instructional design is complemented by interactive features to enable two-way communication between students, teachers and computers to create an active, effective and meaningful learning environment. The process of designing instructional design begins by determining the objectives that will be reached by the user after completion of the application. Afterwards, the process of determining activities, training and testing of users while using instructional designs to be developed will also be determined in this phase. Designers should also ensure that the delivery of information is easily understood and appropriate to the user. In this phase also, various elements - either from the point of content, screen design, exploration system, etc. will be determined.

Interactive instructional design for educational learning of the Negeri Sembilan Tumbuk Kalang music ensemble was developed using the 4.9 Builder Multimedia Builder. The application of this authoring tool is used as it is able to arrange all multimedia elements in line with learning theory, pedagogical approach, multimedia principles, interactive principles and interface principles.

Figure 1. Example of a Multimedia Builder 4.9 authoring site



Interactive is a computer presentation that combines several elements of media, text, graphics, sound and video animations systematically to be an effective instructional design by manipulating audio and visual aspects to attract users and give a profound impact. Therefore, among software other than Multimedia Builder 4.9 used as support for the development of this teaching and learning material is Microsoft Paint (graphics), Ulead 3D Animation (animation), Ulead Video Studio 11 (Video) and Audacity (audio). Overall, this multimedia material combines the various components required for comprehensive music learning such as music, sound, video, text, graphics and animation to create the learning pleasure aspect. The following is a preview of the design of multimedia instructional and learning materials designed for the teaching and learning Negeri Sembilan Tumbuk Kalang music ensemble.

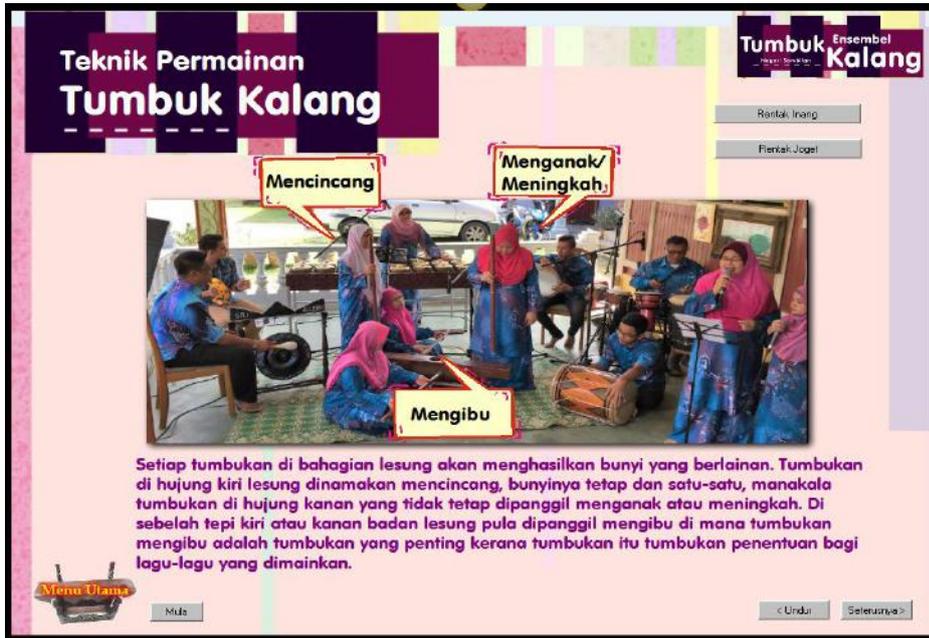
Figure 2. Example of a first interface



Figure 3. Example of the Main Menu



Figure 4. Example of the learning content



Teknik Permainan Tumbuk Kalang

Ensembel Kalang

Rantak Inang
Fierak Jage!

Mencincang
Menganak/
Meningkah
Mengibu

Setiap tumbukan di bahagian lesung akan menghasilkan bunyi yang berlainan. Tumbukan di hujung kiri lesung dinamakan mencincang, bunyinya tetap dan satu-satu, manakala tumbukan di hujung kanan yang tidak tetap dipanggil menganak atau meningkah. Di sebelah tepi kiri atau kanan badan lesung pula dipanggil mengibu di mana tumbukan mengibu adalah tumbukan yang penting kerana tumbukan itu tumbukan penentuan bagi lagu-lagu yang dimainkan.

Menu Utama
Mula
< Undur
Selanjutnya >

Figure 5. Example of learning song



Lagu-Lagu: Anak Bocek

KELUAR →

Ensembel Kalang

MAK : Apo umpan eh si anak bocek
Anak cacing ngolang ngolang

ANAK : Macamano ayo nak manjek
Ayo kocik bolum godang

MAK : Dongar sini hai bocek sayang
Ini pisang omak bawakan

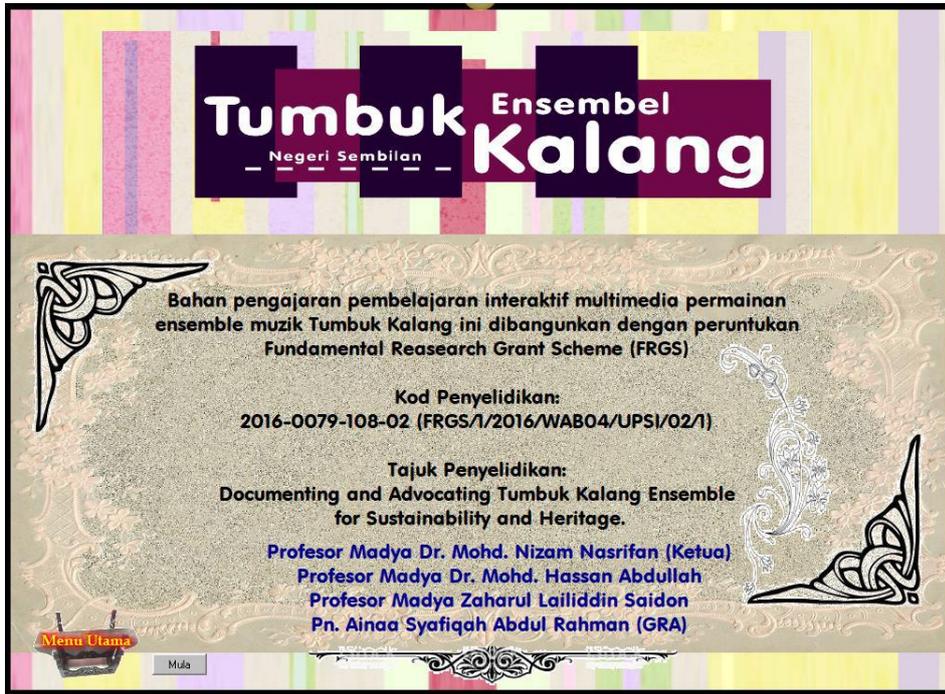
ANAK : Apo pisang omak bawakan

Pisang nangko lah koreh bona
Pisang bomban lah bosa bona
Pisang rajo kulit ei toba
Pisang kapeh masak ei lombik
Pisang omeh lah kocik bona...

Apola pisang ooi alahai omak

Menu Utama
Mula
Skor Lagu
< Undur
Selanjutnya >

Figure 6. Info about the researchers and funder



Testing and evaluation phases were conducted after the digital interactive multimedia material was developed. A questionnaire set was designed to analyze expert's perceptions regarding the appropriateness of its use in the learning process and how the selected students perceived their experiences with the use of the interactive multimedia courseware of teaching and learning Tumbuk Kalang as co-curriculum activity for formal institution settings. In particular, the test was conducted to verify whether the product fulfilled development of the skills needed as a self-learning tool among a group of pupils in the selected secondary school in Seremban, Negeri Sembilan.

A total of 60 respondents involved 58 pupils, 1 lecturer who specialises in the field of instructional technology and 2 music teachers who are involved in teaching Tumbuk Kalang in the test and evaluation process. The following table shows the findings of the questionnaire regarding the suitability of developed courseware from the student perspective.

Section A: Content

Table 2: Content of developed digital interactive courseware

	Criteria	Mean
1.1	Content is directly related to the objectives / learning outcomes	3.22
1.2	Provide all the content or learning experience needed to	3.84

	achieve objectives / learning outcomes	
1.3	Compatible with features (level of ability and maturity) and student experience	3.72
1.4	Relevant to course needs and target groups	3.08
1.5	Latest materials are presented	3.24
1.6	Resolved to small and continuous learning steps	3.24
1.7	Presented in logical order	3.44
	Mean =	3.38

The purpose of the questionnaire in Section A is to determine the content of the interactive multimedia courseware of teaching and learning Tumbuk Kalang in accordance with the learning outcomes, backgrounds and abilities of the students. The highest mean is 3.84 showing the complete content by providing all the content or learning experience needed to achieve learning objectives, while the lowest mean 2.88 shows moderate performances in logical sequences of content. However, the overall mean for Section A is 3.38 which is at High compatibility level. Indirectly, the conclusion is that the content of the interactive multimedia courseware suited the learning outcomes, backgrounds and abilities of the students.

Section B: Instructional Design

The questionnaire related to the instructional design of the developed interactive multimedia courseware was divided into three sections which include the testing of (a) learning outcome, (b) learning activities, and (c) formative evaluation.

(a) Learning outcome

Table 3: Learning outcome

	Criteria	mean
2.1	There are instructional learning objectives for each lesson unit	4.00
2.2	Objectives are written according to the learning hierarchy (Low level to high level)	3.00
2.3	Objectives are clearly and precisely written	4.00
2.4	Objective has the proper verb (measurable and observed)	3.40
2.5	Objective have cognitive, psychomotor and affective domains	2.00



2.6	Objective covers the entire content of the courseware	3.84
	Mean =	3.37

The purpose of this questionnaire is to identify the skills, knowledge or attitudes that must be achieved via the digital method book. Mean 4.00 is shown by item “There are instructional objectives for each lesson unit” and the “Objectives are clearly and accurately written”. However, score of the “Objective items have a cognitive, psychomotor and affective domain” was indicated with a low mean of 2.00. The overall achievement of the evaluation on the learning outcome of the interactive multimedia courseware is 3.37, indicating the suitability at the High level.

(b) Learning activities

Table 4: Learning activities

	Criteria	mean
3.1	Can attract students' attention and motivation	4.00
3.2	Using various methods and media to support self-study (Examples: discussion, simulations, video, Internet materials: e-lectures, youtube, etc.)	3.00
3.3	Students interact with the materials	3.20
3.4	Students interact with other students (face-to-face and / or online)	1.00
3.5	Learning activities run in the order of learning hierarchy	3.80
3.6	Learning activities contain cognitive, psychomotor and affective domains	2.84
3.7	Learning instruction is clear	4.00
3.8	Examples / instructional guides are provided	3.20
3.9	There is a formula for each unit to recall	2.80
3.10	Exercise, test and adequate student feedback (Focus on formative assessment)	3.00
	Mean =	3.08

Testing on the suitability of the methods and media used can give an understanding to

Based on the table above, score related to student criteria interacting with other students (face to face and / or online) is the lowest mean (1.00). This shows that these criteria are not necessarily built into this interactive multimedia courseware. Overall, the designed learning

activities achieve mean 3.08 which shows the suitability at the High level. Testing on the criteria of whether the digital book was able to attract students' motivation as well as the instruction is clearly written resulted with the highest mean of 4.00.

(b) Formative test

Table 5: Formative test

	Criteria	mean
4.1	Provided after completion of small unit of study	3.00
4.2	The test contains knowledge of low level and high level skills	3.00
4.3	The test is based on the objectives and contents of the lessons in the Unit	3.40
4.4	Examples of answers are provided	4.00
4.5	Test instructions are clear	4.00
	Mean =	3.48

The purpose of self-evaluation (formative) is to evaluate student learning progress. Overall, the data shown above shows the suitability of the High Level (Mean = 3.48) on the developed formative test.

Part C: Technical Requirements

Questionnaires related to the developed Technical Requirements is divided into five 4 sections which include testing for (a) language, (b) text (c) graphics and (d) audio visual.

a) Language

Table 6: Language

	Criteria	mean
1.1	Writing style is clear and continuous	4.00
1.2	The instructions are clear	4.00
1.3	Regular and commonly used words	3.20
1.4	The word verb is in the form of active nonverbal	3.40
1.5	The verses are short and accurate	3.80
1.6	Paragraphs are simple and not swirling	4.00
1.7	Numbers are used to indicate sequences of steps in a task or process	3.00
1.8	The writing tone is in the form of support and	3.20

	encouragement	
1.9	The terms are used consistently	2.80
1.10	Abbreviation and symbols are clearly defined	3.00
1.11	Spelling and grammar are consistent and precise	4.0
	Mean =	3.49

b)
Text

Table 7:

Text

	Criteria	mean
2.1	Clear text	4.00
2.2	Font size 12 for text	4.00
2.3	Font size 18 for headline (bold)	3.20
2.4	Font size 14 for small heading (bold)	3.40
2.5	Use capital letters if the title is less than 4 words	3.80
	Mean =	3.68

c) Visual

Table 8: Visual

	Criteria	mean
3.1	Easy and not crowded	3.40
3.2	Position is appropriate	3.40
3.3	Balance (formal or informal)	3.20
3.4	There is a contrast between the subject with the background	3.40
3.5	Color usage (recommended no more than 4 colors)	3.80
3.6	Color used to emphasis the concept	3.40
	Min =	3.43

d) Audio

Table 9: Audio

	Criteria	mean
4.1	Audio is clear	4.00
4.2	Sound or music effects match	4.00
4.3	Audio sync compatibility with visuals	4.00
4.4	Clear static visual	3.40
4.5	Animation can explain the concept	3.80
4.6	Visual motion (video) can explain the concept	3.00



Mean =	3.70
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Based on the average scores shown above, the overall evaluation of technical requirements concerning language presentation (3.49), text (3.68), visual (3.43) and audio (3.70) applied in the interactive multimedia courseware is at a high level of relevance.

Generally, findings associated to the usage of developed interactive multimedia courseware among schoolchildren are overwhelming. This can be seen from the mean score being on the 'High' classification based on indicator with regard to the suitability of the Content (3.38), Instructional Design (3.34) and Technical Requirements (3.57). Advances in technology enable pedagogical enhancements that some believe can revolutionize traditional methods of teaching and learning (Persin, 2002; Smith & Woody, 2000). The researchers found the experts and pupils agreed that the digital interactive multimedia courseware produced an alternative to conventional recorder lessons. Nonetheless, data also determined that there is a need to have further emphasis to focus on the cognitive, psychomotor and affective domains. The result also specified that the interactive multimedia courseware provided with effective arrangement of graphics, fonts and visual throughout the lesson was capable on engaging user with each slide shown.

Overall, the results from the findings show that respondents are very interested in this interactive multimedia courseware as they are more attractive as learning tools and form a new learning environment experience.

Conclusion

This article was based on research project “FUNDAMENTAL RESEARCH GRANT SCHEME (FRGS)”, Code: 2016-0079-108-02 (FRGS/1/2016/WAB04/UPSI/02/1), Title: *Documenting and Advocating Tumbuk Kalang Ensemble for Sustainability and Heritage* funded by Ministry of Education Malaysia. Referring to Jonassen (1996), technology has the competency to incorporate elements of multimedia which inspires and appends concentration to learning as it lets students employ more than one of their senses concurrently. The use of



learning courseware offers an enormous transformation in learning methods and amplifies personal enthusiasm with the support of frequent practice and repetition. Nevertheless, Mohd Farhan (2006) stated that the effectiveness of a particular courseware not only depends on its contents, but also on its design and the conception of the courseware's development. The self-learning material developed and delivered in this research project is digital and software based. This learning material can be viewed as small interactive multimedia elements. The use of multimedia courseware contributes to the achievement of the teaching and learning intentions and is a learning process that makes it easy for students to access topics delivered through a well-planned and organized sequence. This research study concludes that the development of self-learning courseware has achieved the learning objectives while the majority of respondents indicate positive feedback through each item proposed in the evaluation sheet.

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