Multimedia lesson development: melodic instruments in string quartet for grade-8 students, Demonstration School of Suan Sunandha Rahabhat University

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Abstract

This paper aims 1) to develop a multimedia melodic instruments in string quartet 2) to compare achievement of pre- and post-learning multimedia lesson and 3) to examine satisfaction towards the lesson. A sample group was 35 grade-8 (room 4) students (grade-8 /4) in second semester, academic year of 2018. 1) a multimedia lesson 2) questionnaire and 3) satisfaction questionnaire were utilized as research tools. Analysis was conducted by utilizing mean, standard deviation (S.D) and t-test.

The study revealed that 1) the lesson was obtained 2) post-learning achievement was better than pre-learning one with statistical significance at .05 3) satisfaction towards the lesson in the students was high.

Keyword(s): Multimedia and Thai music instrument

Introduction

The purpose of Basic Education Core Curriculum, B.E. 2551 (2008) is to enhance 5 core competencies i.e., communication, cognitive ability, problem solving, life skills and technological literacy (Ministry of Education, B.E.2551 (2008):6). Learning groups consists of 8 aspects. One of such aspect is art which is an area emphasizing knowledge, initiative, imagination, creativity, art, aesthetics and art appreciation. The art is categorized into 3 areas i.e., visual art, music and dramatic arts. As for music area, it emphasizes understanding of several musical instruments in an ensemble leading to a birth of musical bands, musical relationship, history and culture, musical appreciation as a cultural heritage, local wisdom, Thai wisdom and international intellect. In grade 8, the students must be capable to explain a relationship and influence of music towards Thai society and identify diversity of musical elements in varied cultures.

Nowadays computer technology plays a direct role in our way of life. Students in current generation are growth up with information technology; as a result, an application of technology is very common for them (Aljaloud et al., 2015; Wang & Lieberoth, 2016). Computer Assistance-Instruction (CAI) media capable to interact with and analyze leaners to promote cognitive skills and improve their weaknesses and assess their capabilities are inadequate or not widely used as most of media are just a lesson for reading contained with exercises, they cannot adapt to the needs demanded from learners leading to a dull experience (Wachira In-udom, 2003). Multimedia-based instructional management consists of multimedia (applied by an instructor) to utilize as teaching materials in various subjects. Instructional medium is a teaching material suitable for student or leaner-centered learning (Nathasak Janphet et al., 2015).

As a Thai music teacher of secondary education level (grade 8) in Demonstration School of Suan Sunandha Rahabhat University, the author, based on the past teaching experience, realizes that good know-how, knowledge, understanding and skills in identifying melodic instruments, especially chordophones in Thai string quartet that are used in an ensemble are lacking and insufficient in students; worse still, the students are unable to interpret what they have listened and appreciate the music. Musical instruction management has some limitations as a music instrument needs practice and training in skill and experience in order to differentiate. As such, in order to be successful in instruction as per the Curriculum, multimedia are essential as learner should be able to understand the subject's content clearly and rapidly and it facilitate explanation and exemplification with sound, image, animation helping student in getting a more real idea and creating interaction; thus, a modern learning is successful (Yeun Phuworawa, 2003: 47-48).

Based on above reasons, multimedia computer lesson: melodic instruments in string quartet for grade-8 students, Demonstration School of Suan Sunandha Rahabhat University was developed. Main contents were digested into multimedia computer form consisted of caption, animation and music for easy learning and understanding leading to better learning achievement.

Objective(s)

1. To develop a multimedia lesson of melodic instruments in string quartet for grade-8 students;

2. To compare achievement of pre- and post-learning computer multimedia lesson;

3. To examine satisfaction towards the lesson: melodic instruments in string quartet for grade-8 students.

Document and literature review

1. A concept applied in instruction was based on theory-based learning by Robert Gagne (1985 as cited in Sakda Sujarit, 2015) and interactive learning was utilized. 9 instructional principles are 1) gaining attention before lesson introduction: motivation and stimulation should be applied 2) specifying objective as better memorization and understanding can be achieved 3) activating prior knowledge: a review of existed knowledge before presenting the new one 4) presenting new information: related images with short but concise captions should be presented (illustration) 5) guiding learning achieved by a good content management and connecting to learners' existed experience or knowledge 6) eliciting response: efficient learning relates to how steps and procedures are proceeded, learners will have a good memorization if they have an opportunity to think and participate in activities related to the contents and in answering questions 7) providing feedbacks by stating clear goals and informing their progress and how far from their target (if feedbacks are provided with illustration, better motivation can be achieved) 8) assessing performance: a section to let learners test their knowledge and 9) reviewing and transferring: ideas derived from the key contents are concluded and several suggestions are provided to let learners review the knowledge.

2. Multimedia is a computer display content combined with different content forms; it is created to allow a learner to perceive, choose and receive information via a monitor. Such information is a combination of text, images, animation, sound and videos in order to allow a user to respond and interact with the medium directly. Multimedia applied in education is called educational multimedia. Multimedia for learning is making of educational media designed with computer-based program for learners; the learners just

simply open and use such media contained with interactively completed contents with ease as determined by a package software (Department of Curriculum and Instruction Development, 2001:24). Learning process design and development of multimedia is in align with instruction objectives by Monchai Thienthong (2005:131) with the following details: ADDIE is a widely recognized model and has been applied in computer-based lesson; the lesson can cover all main points utilized in computer lesson design. As for the making of multimedia: the colorful string instruments for grade 7 students, an analysis was performed and objectives for creating the multimedia computer lesson was specified based on ADDIE i.e., phase 1: analysis; phase 2: design; phase 3: development; phase 4: implementation and phase 5: evaluation.

3. Relevant literature

Chao-wut Arunthong (2012: abstract) has conducted a study : learning with a computer lesson: Thai chordophones for grade 12 students; the results showed a more efficient instruction by 86.67/88.14 % exceeding the determined criterion 80/80, signifying that the computer lesson was effective in align with the hypothesis, a satisfaction survey revealed $\bar{x}$= 4.71 in "totally agreed" level; therefore, the hypothesis was true.

Akkaphon Hamklang (2007: abstract) has conducted a study on CAI: percussions in Piphat (Thai wooden flute and percussion band) for grade 8 students, Suratham Phithak School, Nakhon Ratchasimal and found that efficacy in CAI was 33.33/84.79, learning achievement index of CAI = 0.7818, progression in the students = 78.81%, the students learning with CAI had better learning achievement with statistical significance at .01.

Nitthaya Limsanit (2017: abstract) has conducted a study: development of multimedia instruction kits to develop western music based on The Kodály concept for grade 8 students and found that statistical significance was .05 according to a comparison of pre- and post-learning achievement tests, satisfaction results of the kits were in "very satisfied" level.

Pawinee Rattanakorn (2018: abstract) The development of learning based on the Connectivism model in Biology, genetics engineering to promote information literacy skills. For students of twelve Grade students The sample is a student Science-Mathematics Demonstration School Suan Sunandha Rajabhat University Randomized controlled trial and control group People by simple random methods. The experimental group. Study in the form of teaching subjects Biology, genetics engineering Control group Learn in the traditional teaching style By making a report The posttest scores were compared with the control group The students are taught in the form of teaching Improve the skills of feedback from higher data Students learn in report.

Research methodology

1. Delimitation

1) Population and sample group

35 grade 8 room 4 students, Demonstration School of Suan Sunandha Rahabhat University, 2nd semester, academic year of 2018 were selected in the population.

2) A content utilized in the research was melodic instruments in string quartet based on the art area in the Basic Education Core Curriculum, B.E. 2551 (2008).

2. Tool(s)

1) A multimedia lesson: melodic instruments in string quartet for grade-8 students

2) A 5-rating scale quality evaluation questionnaire of multimedia computer lesson for experts in the contents and information technology

3) Pre and post-learning achievement tests (4 choices, 20 questions) of the lesson: melodic instruments in string quartet based on Art area in the Basic Education Core Curriculum, B.E. 2551 (2008)

4) A developed 5-rating scale satisfaction questionnaire towards multimedia computer lesson for grade 8 students

3. Methodology

1) Conduct a document and literature review related to multimedia computer lesson development and creation of learning achievement evaluation model;

2) Design a multimedia computer lesson by determining objectives and expected learning achievement of the lesson: melodic instruments in string quartet, outline and prioritize contents;

3) Develop the lesson by applying ADDIE model in this process and making of learning achievement evaluation model

4) Evaluate quality of the lesson and create the evaluation model by allowing the experts to inspect and test with students outside the sample group;

5) Implement the lesson and evaluation model with the sample group;

6) Evaluate learning achievement from the lesson by comparing pre- and post- learning and evaluate satisfaction levels of students towards such lesson.

Results

Based on the created lesson, it was found that

1. 1. Results of the multimedia computer lesson: melodic instruments in string quartet for grade 8 students:

Table: 1 Quality evaluation for the multimedia computer lesson

Evaluation	$\bar{x}$	S.D.	Quality level
Content	4.89	0.36	Excellent
Language	4.75	0.45	Excellent
Image and sound	4.78	0.44	Excellent
Total	4.81	0.40	Excellent

Based on table 1, satisfaction level is excellent ($\bar{x}$= 4.81, S.D. = 0.40), individual aspects are examined (based on experts comments) - contents are excellent ($\bar{x}$= 4.89, S.D. = 0.36), image and sound are excellent ($\bar{x}$= 4.78, S.D. = 0.44) and language is excellent ($\bar{x}$=4.75, S.D. = 0.45), respectively.

2. A comparison of pre- and post-learning achievement in the multimedia computer lesson is as follows:

Table 2: The comparison of pre- and post-learning achievement with the multimedia computer lesson:

Test(s)	n	$\bar{x}$	S.D.	t	P
Pre-testing with the multimedia computer lesson	35	11.13	3.05	12.60	.00
Post-testing with the multimedia computer lesson	35	16.20	3.40		

*p <.05

Based on table 2: pre-learning score = $\bar{x}$= 11.13, S.D. = 3.05 and post-learning score = $\bar{x}$= 16.20, S.D. = 3.40; the comparison based on pre-testing and post-testing showed that post-testing gains better results than pre-testing with statistical significance at .05.

3. Results of satisfaction evaluation given by students are as follows:

Table 3: The satisfaction evaluation of the multimedia computer lesson:

Description	$\bar{x}$	S.D.	Interpretation
Introduction			
1. Is the introduction interesting and appealing?	4.27	0.69	High
2. Are the objectives clear?	4.30	0.60	High
3. Does each title provide a clear content?	4.47	0.63	High
4. Are the amounts of contents suitable, sufficient and no more and no less?	4.27	0.69	High
5. Are the contents arranged orderly, continuously and understood easily?	4.43	0.57	High
Sub-total	4.35	0.63	High
Lesson arrangement			
6. Do the usage instructions make self-learning possible?	4.27	0.74	High
7. Are the history and background of music provided before continuing to melodic instruments in a string quartet?	4.27	0.64	High
8. Are illustrations, videos and short and brief description provided?	4.27	0.64	High
9. Is a duration suitable?	4.07	0.69	High
Sub-total	4.22	0.68	High

Table 3: (ต่อ)

Description	$\bar{x}$	S.D.	Interpretation
Design			
10. Is resolution suitable, easy to use and uninterrupted?	4.37	0.61	High
11. Are font sizes, color and form beautiful and easy to read?	4.50	0.57	Highest
12. Are illustrations clear and suitable to the lesson?	4.57	0.50	Highest
13. Are music tracks clear and suitable to the lesson?	4.40	0.62	High
Sub-total	4.46	0.58	High
Tests			
14. Are tests in align with the lesson?	4.40	0.56	High
15. Is the number of questions suitable to the lesson?	4.57	0.50	Highest
16. Is a way to answer the questions easy and able to change before submitting?	4.47	0.63	High
17. Does the score show after finishing the tests?	4.53	0.57	Highest
Sub-total	4.49	0.57	High
Learning benefits			
18. Is it possible to review what a learner do not understand?	4.33	0.61	High
19. After the lesson, does a learner gain knowledge,	4.33	0.55	High

	understanding of melodic instruments in string quartet?			
20.	Is a learner able to apply what you have learned in a study of other types in Thai musical instruments?	4.57	0.50	Highest
	Sub-total	4.41	0.56	High
	Total	4.38	0.61	High

Based on Table 3, overall satisfaction level of students towards multimedia computer lesson is high ($\bar{x}$ = 4.38, S.D. = 0.61), individual aspects are examined - tests gains high satisfaction ($\bar{x}$ = 4.49, S.D. = 0.57); design gains high satisfaction ($\bar{x}$ = 4.46, S.D. = 0.58); Learning benefits gains high satisfaction ($\bar{x}$ = 4.41, S.D. = 0.56); introduction and contents gain high satisfaction ($\bar{x}$= 4.35, S.D. = 0.63) and lesson arrangement gains high satisfaction ($\bar{x}$ = 4.22, S.D. = 0.68).

Discussion

Multimedia lesson development: melodic instruments in string quartet for grade-8 students can be discussed as follows:

1. The study has been conducted by reviewing documents and researches related to multimedia computer lesson development and creation of learning achievement evaluation model, then the obtained data was applied in a design and development of multimedia computer lesson. Next, contents were outlined and prioritized based on ADDIE model. Afterwards, the lesson was created and contained the following main parts i.e., 1) front page 2) table of contents 3) how to use 4) goals 5) definition and importance of Thai musical instruments 6) types of melodic instruments in string quartet 7) types of chordophones 8) lute 9) lyre 10) tests 11) scoring 12) correct answers. 3 experts evaluated the created lesson and concluded that its overall quality was excellent. According to a research conducted by Tharida Sakulrat 2014), a developed computer-based lesson that has proper and clear contents soundtracks, illustrations, accurate definitions, suitable font size, prioritized contents, interested and enjoyable activities leads to a good computer-based lesson.

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2. Pre-test and post-test were performed to compare pre- and post-learning achievement, after testing it was found that with the developed multimedia computer lesson, post-learning achievement was better with statistical significance at .05, signifying that the students gained better understanding and knowledge from the contents, real experiences i.e., characteristics, how to play the instruments and real sound created from the instruments; all knowledge could be fully learned, was retrievable and could be reviewed as needed; moreover, personal difficulties could be relieved i.e., the learners were satisfied and no pressure concerning inability to catch up was put on the students while learning leading to more effective learning. These are in conformity with the statement by Thitsana Khammanee (2009): good proficiency and skillfulness can be achieved by training and doing repeatedly.

3. Satisfaction in the multimedia computer lesson was high as the students could study the lesson by themselves; the developed lesson had a good and continuous arrangement of contents, was easy to understand, had legible and beautiful fonts; illustrations were suitable to the lesson; post-testing was provided at the end of lesson and results were provided instantly after testing making good learning experience and all

contents could be reviewed as needed and obtained knowledge could be applied to other Thai musical instruments. These are in conformity with the research: the learning multimedia development: musical instruments of Bangluang community conducted by Ariruth Sathiman et al., (2013) with all high satisfaction results.

Suggestion

Based on the study, suggestions are as follows:

1. Multimedia computer lesson in other field should be developed to encourage learning and good learning achievement in leaners;

2. Comparison of learning achievement results from multimedia computer lesson and other instructional material should be performed.

Reference(s)

Department of Curriculum and Instruction Development. (2014). **Educational multimedia knowledge.** Bangkok: Book Development Center (Department of Curriculum and Instruction Development), MoE.

Ministry of Education. (2008). **Basic Education Core Curriculum, B.E. 2551 (2008),** MoE.

Chaowut Aruthong. (2011). **A study on learning with a computer lesson: chordophones for grade 12 students.** Fine Arts Journal (Khon Kaen University), (1): 123-140.

Nathasak Janphet, Wanraya Thamaphiban and Jinthana Kasinan. (2015). **CAI development: robotics programming for grade-11 students.** Princess of Naradhiwas University, 7(1): 106-114.

Thitsana Khammanee. (2014). **Teaching science for effective learning management knowledge.** 10th Edition. Bangkok: Darnsutha Press.

Tharida Sakulrath. (2014). **CAI development: floral arts for hotel.** Rajamangala University of Technology Suvarnabhumi, Phra Nakhon Si Ayutthaya.

Nitthaya Limsanit. (2017). **A study: development of multimedia instruction kits to develop western music based on The Kodály concept for grade 7 students. Master's thesis, Department of Curriculum and Instructional Development**, Suratthani Rajabhat University, Suratthani.

Pawinee Rattanakorn. (2018). **The development of learning based on the Connectivism model in Biology, genetics engineering for twelve Grade students.** The ICBTS 2018 International Academic Multidisciplinary Research Conference in Amsterdam.

Monchai Thienthong. (2005). **Courseware design and development for computer lesson.** (2nd Edition). Bangkok: King Mongkut's University of Technology North Bangkok.

Yeun Phuworawa. (2003). **ICT for Thai education.** Bangkok: SE-Education.

Wachira In-udom. (2003). **Educational materials for teaching computer subject.** Khon Kaen: Educational Technology program Faculty of Education, Khon Kaen University (Mimeographed).

Sakda Sujarit. (2015). **E-book developed based on Robert Gagne's learning process: design for memory, message design course for undergraduate students, Educational technology program.** Master's thesis of Educational technology program, Burapha University, Chonburi.

Ariruth Sathiman et al. (2013). **The learning multimedia development: musical instruments of Bangluang community.** Silpakorn Educational Research Journal, 5(1), 34-47.

Akkaphon Hamklang. (2011). **A study on CAI: percussion in Piphat (Thai wooden flute and percussion band) for grade 8 students, Suratham Phithak School, Nakhon Ratchasimal**. Master's thesis, Department of Music Education, Bansomdejchaopraya Rajabhat University, Bangkok.

Aljaloud, A., Gromik, N., Billingsley, W. & Kwan, P. (2015). **Research trends in student response Systems**. a Literature Review. International Journal of Learning logy, *10*(4), 313-325.