

Developmental Testing of Computer Assisted Instruction Lesson on Five Precepts for Primary School Grade 4–6

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ABSTRACT

The purposes of this research were two reasons; 1) to develop a Computer Assisted Instruction (CAI) lesson on Five Precepts, 2) to determine efficiency on a Computer Assisted Instruction (CAI) Lesson on Five Precepts for Primary School grade 4 – 6. The sample consisted of 30 pupils randomly selected from those registering to study in the semester of 2560 B.E. academic year at Ban Homgred School, Sampran district, Nakorn-pathom province. It was found that the efficiency of the Computer Assisted Instruction on Five Precepts for Primary School was in agreement with the established. Pupils evaluation of the “CAI-Multimedia on Five Precepts for Primary School Grade 4–6” was 4.89 (excellence). Pupil opinion evaluation by interview and examination of learning showed that the pupils in the study were reasonably by the “CAI” exercises in their learning and that they expected to improve their learning on Five Precepts for Primary School. They were also very happy while learning. Thus, CAI could be used effectively for teaching and learning.

Keywords: Computer Assisted Instruction (CAI); Five precepts; primary school; pupils

Introduction

Buddhist 5 precepts are basic moral principle in practical life for everybody in society beyond of any race, language or culture boundary, they all are guided under the framework of 5 precepts, including of non-violence, generosity, respect for the right, trust, honesty and the acts supporting trust on each other. These virtues are the overall contents of 5 precepts. According to Buddhism, 5 Precepts are the moral codes to be studied and avoided called as “Pancasila” consisting of an abstaining from violence or life killing etc. and the process of practice or follows in daily life called “Pancadhamma” consisting of benevolences etc. This process is considered as a basic duty of all Buddhists to learn, promote and follow in everyday life for peace and happiness for oneself, family and society.

Encouraging people to observe 5 precepts with sincere intention for the sake of happiness of individual and family as well as well-being of people in society are most important tasks of Buddhism. As the Buddha persuaded 60 Arahant bhikkhus to promote Dhamma at first time saying that ‘O Bhikkhus you should set forth journey for great benefits of many, happiness of many and social well-being, for gaining, benefits and happiness of all human and deities.’¹ This statement becomes obvious witness for Buddhists’ mission.

Transferring and enhancing the process of learning on 5 precepts become important and necessary because at the recent days, information technology progress is in advance, playing effective role in practical lives. It unavoidably becomes an important tool in spreading the information and contents to public quickly and widely. If these information communication technologies can be used as a tool to promote the learning process of the 5 precepts, it would be of great benefit to encourage children and young people to study Buddhism in higher level effectively.

In other reason, the National Education Act, BE 2542, Section 22, Chapter 4, Guidelines for Educational Management enforces the educational management to focus on learners’ ability in learning and developing themselves and the learner would play as a

¹ Mahachulalongkornrajavidyalaya University, Vinaya Pitaka, (Pali) Vol.4. (Bangkok: Mahachulalongkornrajavidyalaya University, 1992), p.27.

learning-center. The educational management must encourage students to develop themselves naturally with their full potentials.² From the said policy of the National Education Act, 1999, Section 22, it will be seen that the teaching medias hold the important factor as tools to encourage and support the learners for improving oneself as self-learner-center. Educational media known as "Computer-Assisted Instruction" is one of the types of media that provides such high academic achievement, since this computer-assisted instruction varies a multimedia presentation which increases the concentration on the lesson to students as well. The Computer-Assisted Instruction (CAI) helps solving the teaching problems. It is widely accepted among educators because many research has identified the problematic backgrounds of different learners, One-on-one tutoring, problem of time shortage and shortage of the subject experts.³

CAI can also make the subject lesson more concrete, changing hard things that are complicated to be easily understood by learners. Its animative motion can clearly show moving figures. The voice media can be used for guiding connotation related to pronunciation or imitation of accent to the language learners for better understanding successfully, so the Computer-Assisted Instruction produces advantages of being able to interact with learners directly, providing an animative figures and the choices on quiz when student answered wrongly.

Learning on Social Studies, Religion and Culture help learners to understand human life as an individual and social cooperation, adaptation to their environment, limited resource management, understanding the development needs which are changing in every single day due to various factors. It also supports the understanding of oneself and others, tolerant, accepting on different and moral background of people. Students can apply the learned

² Office of the National Education Commission Office of the Prime Minister, **National Education Act, BE 2542 (1999), Amended (No. 2) BE 2545 and (No. 3) BE 2553.** (Bangkok: Office of the National Education Commission, 2003), p. 13.

³ Thanomporn (Tonpipat) Laojarusang, **Principles of Computer-Assisted Instruction Design,** (Bangkok, 1998) p.

knowledge to real life, and become a citizen of the nation and the world.⁴ The management of teaching techniques, social studies, religion and culture must be encouraged and supported so that learners can learn at any time, everywhere and learning throughout their life from various sources. These kinds of learning resources of social studies, religion and culture are not restricted only in classroom, school or student's textbooks. It will also include a variety of learning resources, both on and off classes, including printed books, medias such as reference books, electronic medias such as multimedia, CAI, video, etc. and the local learning resources, such as museums, etc.⁵

From the survey of learning media with computer-assisted instruction in schools, it was found that there was very little in using such CAI and still not enough to be used for teaching. Most teaching materials are also quite expensive in price. The media used at the present is not compatible with the contents required. Due to 5 Precepts learning and teaching for children and youth in primary school must be studied alongside with the theories and practical contents in field work in order to achieve the learning process, management thinking process, confronting the real situations and implementing of the learned knowledge to prevent and solve problems. At present, most of the instructional medias remain only in textual books and many teachers also still use the old tradition of learning by forcing students to memorize, teaching by explanation or describing to students to keep in mind. This traditional teaching style emphasizes on transfer the knowledge rather than procedure for encouraging students to have critical thinking, self-studies and finally it cuts off students' enthusiasm as well as interesting in the lessons. Therefore, the researcher investigated in bringing knowledge of the 5 precepts to integrate for propagation using the innovative computer-assisted instructional (CAI) media which is very useful and suitable for children and youth.

⁴ Bureau of Academic and Educational Standards Ministry of Education, *The Measurement and Evaluation of Learning Curriculum Based on Core Curriculum, Basic Education 2008*, (Bangkok: The Agricultural Cooperative Federation of Thailand, 2010), p.3.

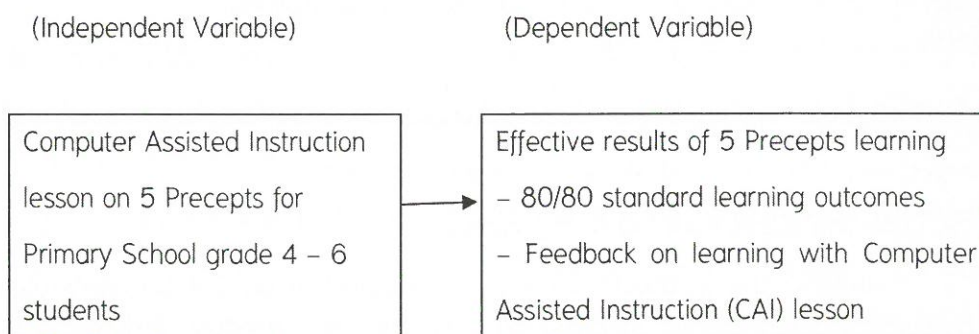
⁵ Department of Academic Affairs, Ministry of Education, *Learning Organization The Science-Based Learning Curriculum According to the Basic Education Curriculum BE 2 5 5 1*. (Bangkok: Printing House, Teachers Council, Ladprao, 2003), p. 249.

Research Objectives

The object of this research is to produce and finds out the effective Computer Assisted Instruction lesson on 5 Precepts for Primary School grade 4–6 pupils.

Research Framework

The researcher had studied principle, theories and research reports to set the framework for research in the following;



Research Methodology

This research was divided into 2 parts;

1. The procedure of developing this CAI lesson on 5 Precepts for primary school students (grade 4–6) was done by following the concerned principle, theories and reviewed by experts then brought to One to One Testing with 3 students; the one student in good group (average marks are 3.0 and above), 1 student for the moderate group (2.01–2.99), and 1 student from the weak group (not above 2.0). After completing the design of CAI on 5 precepts, then it was brought to testing with small group. The lessons tested were revised from the first experiment and then having real tested with 9 students of Ban Klongmahasawat School, Phuttamonthon district, Nakhonpathom province by random sampling from 3 students from weak group, 3 students from moderate group, 3 students from good group then reviewed and finally completed into CAI package form.

2. The performance testing of the CAI on 5 precepts for primary school grade 4 –6 students by valuating the effectiveness of the CAI on 5 precepts with Banhomgred school, Sampran district, Nakhonpathom province.

Data collection

Conducting an effective Computer-Assisted Instruction lesson was done by collecting data using CAI on 5 precepts to experiment with primary school grade 4 – 6 students, on first semester of academic year 2017, Baan-Homered school, Sampran district, Nakhonpathom province scheduled on 20 – 21 July 2017 as followings:

1. Explaining the process of learning about CAI on 5 precepts to students, pre-testing by students, also note the test score, study contents and learning activities in each unit was done respectively. When finished, students took the post-test.

2. Collecting scores from CAI on 5 precepts.

3 . Collecting the feedbacks on CAI and satisfaction on CAI use generated by questionnaire.

4 . Bring all the data to check integrity and analysis by statistical methods; percentage, means, standard deviation, the statistics used to determine the quality of the test were: Difficulty Index, Discrimination Index, Index of Consistency between test items and expected learning outcomes using the mean, reliability of questionnaire by using Kuder-Richardson.

Results of research data analysis

The researcher concludes this research in two steps; developing research tools, and valuating the effectiveness of CAI lessons seen in the following steps;

Step 1: Development of research tools

1) In the scope of subject contents, researcher analyzed to determine the content range of 6 units including;

1) Introduction, meaning and importance of 5 precepts

2) Precepts 1 Pacinatipata veramani sikkhapadang samadiyami

3) Precepts 2 Adinnadana veramani sikkhapadang samadiyami

4) Precepts 3 Kamesumicchacara veramanisikkhapadang samadiyami

5) Precepts 4 Musavada veramani sikkhapadang samadiyami

6) Precepts5 Suramarayamajjapamadatthana veramani sikkhapadang samadiyami

Subsequently, it was evaluated by the accuracy and language of the IOC to examine. It found that its contents were in consistency index of 0.50 and above.

2) Setting a qualitative assessment by arranging in the form of a 5 –level rating scale. The results of the evaluation of CAI on 5 precepts for primary school grade 4–6 students showed that most of them had standard quality, gaining average score at 3.51 which means higher quality.

3) Creating a test to measure the learning achievement with scoring by multiple choice test of 80 questions for pre–test and post–test. To use the CAI for primary school grade 4–6 students, was analyzed the Difficulty (p) and the Discrimination (r) to choose standard questions with difficulty test between 0.2 – 0.8 and the Discrimination from 0.2 and above. It was selected only 50 questions.

4) Forming an Attitude Assessment Form by a five–level rating scale for assessing students' attitudes toward CAI. It was found that this model had a reliability coefficient confidence at .76 and found that the evaluation items were of standard quality with an average score of 3.51, which meant better quality.

5) Creating and evaluating the lesson quality of CAI on 5 precepts for primary school grade 4 –6 students. The researcher had valued and quality assessment form then created by attitude from experts. It was found that most of them were of the standard quality with an average score from 3.5 which means better quality.

Step 2: Finding the effectiveness of CAI lesson

1) For experiment to find out the effectiveness of CAI. The researcher had set up one shot case study method which is a sample of CAI in 11 individuals and small group of students from primary school grade 4–6, Ban Klongmahasawat School, Phuttamonthon

district, Nakhonpathom province, and 30 students from field-based field from Ban Homgred School, Sampran district, Nakhonpathom province. They were all students of first semester of the academic year 2017, the experiment was divided into 3 times;

The first time, One to One Testing was a trial of three students. The results showed that the lessons were effective at 82.33%, effective in higher standard at 84.56% which appears higher than 80/80 of measured set and having the efficiency equals 83.44%.

The second time, experimented with Small Group Testing. It was small groups (9 persons). The results showed that the lessons were found to be effective overall at 82.33% / 84.56%, efficiency over 80/80 and efficiency at 83.75%.

1) The third time, Field Testing with sampling 30 students. The results of the experiment showed that the lessons learned were overall effective at 81.83 % / 85.67% which was above 80/80 and having the efficiency at 83.75%.

2) Comparison of learning achievement. The average score of the tests during the study and the post-test after the third experiment (field trial) were compared with learning achievement results by means of non-independent distributions. The T-test results between pre-test and post-test showed that the mean scores were 81.83 % (SD = 9.746) and 85.67% (SD = 8.318) respectively. There were statistically significant at .001 ($t = 7.092$, $p < .001$)

3) The attitudes towards using CAI were found that the samples were average score of attitude towards using CAI with satisfactory (= 4.00, SD = 0.61) and from interviews, the most of the samples were interested in the content presentation format and lesson activities.

Discussion of the study results

The research and development of CAI on 5 precepts for Primary School grade 4–6 students found to be more effective than 80/80 which can be discussed as follows;

1. This CAI on 5 precepts for Primary School grade 4–6 students were developed by focusing on the presentation of various contents, slides, animations, voices, music, and interactive lessons, and then mixed together for its interesting. Also, the use of this lesson is

consistent with the theory of difference between each student who have the ability to learn at different times. So, this lesson will help students feel satisfied with studies and less of pressure when learning more slowly than others. It reduces stress during class. This results in higher learning efficiency which comply with psychological principles and theories. The difference between people is that every human being has different beliefs, interests, aptitudes, abilities, emotions, intellect, so each learner can learn differently. Each person's way of learning is different. Therefore, the design of the lesson must be flexible, cutting the difficulty level to meet the needs of individuals as well.

2. The production of CAI on 5 precepts for Primary School grade 4–6 students. The researcher has planned to develop CAI systematically and proceed in step by step starting from the purpose, analyzing the content to fit the learner's age, planning action, developing of lessons and provision in every step previewed and evaluated by experts appeared very good. Then, the lessons were tested for efficiency of the research and development process three times. Each time, the defects were corrected. The first time was a randomized test from 3 samples. The second time was tested by sampling 9 students using to examine the effectiveness of CAI. The third time was experiment from a sample of 30 students, then the data were analyzed statistically to find the standard efficiency of 80/80, the overall efficiency of the CAI showed more effective than the criteria set, there may be a reason to support it by followings;

2.1 Creating CAI on 5 precepts for Primary School grade 4–6 students focuses on Dharma studies in new idea, it also must be excited, eager to learn, attending the class before lesson. In spite of the timeout, students still do not want to leave the classroom which can be seen from the average score of attitudes towards the use of the CAI set at good level.

2.2 Creation of CAI on 5 precepts for Primary School grade 4–6 students was done by creating and planning development in every steps by experts and consultants. The technical program advice was investigated for correct the mistakes and evaluating before pre-field testing, this quality assessment assures that the CAI on 5 precepts for Primary School grade 4–6 students contained good quality, efficiency and it can be used in teaching.

3 . From observing the behavior of the learners, it found that students were enthusiastic and determined to learn with this CAI, because this CAI contains multimedia content, including various sections, i.e. exercises, activities and games about 5 precepts designed to help students monitor their progress and reinforced in learning. Learners appreciated and happily interacted to lessons that related with lessons satisfactorily. The result found that students learn quickly and at the end of the lesson, all of the learner can summarize the lesson by exercise and its reports immediately. It provides the students the happiness of their abilities which are consistent with the notion that CIA will encourage students to interact and feedback of the lesson, enabling learners to actively seek out diverse information and knowledge. From questions and interviews of students, it was found that students are satisfied with the CAI on 5 precepts for Primary School grade 4–6 students because they have conclusive examples, games, activities, exercises, supportive activities with audio of contents explanation which does not bother students but rather helping to understand the 5 precepts very well.

Suggestions

From the development of CAI on 5 precepts for Primary School grade 4 – 6 students as proposed above, researcher has suggestions as follows.

8.1 General Suggestions

1.The CAI on 5 precepts should be published and distributed for Primary School grade 4 – 6 students as a copy of the DVD-ROM for schools nationwide.

2. It should promote the development of CAI in other subjects in the management of education and training in moral education. This will be an option for self-learners who are able to meet the differences between individuals.

3. With the advancement of information and technology spreading rapidly and widely, it should bring CAI to develop as an application installed on smartphone.

8.2 Suggestions for further research

1. This research and development of CAI on 5 precepts for Primary School grade 4 – 6 students, is only one part of the learning process. There should be research for the development of CAI for other subjects in order to be an alternative for teachers to use effectively for teaching and learning in or out classes in future.

2. There should be a comparative studies of effective achievement of students between CAI and learning with other types of media such as Internet learning or comparing with teaching from teachers in the classroom etc.

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