Original Article

Sex Ed. CAI Creation for Young Teen in Thailand

Kitti Krungkraipetch

Abstract

Introduction: Studies on difficult subjects and inexperienced instructors have made curriculum outcomes unsatisfactory. One of the samples was sex education. Educational tools were therefore essential for learning. Computer Aid Instruction (CAI) was one of the study tools for these supplements.

Methods: The aim of this study was to generate sex education-CAI for Thai teenagers. We selected three sex-education topics according to the student's preferences and created the first CAI prototype. Efficient scores and indexes were used to test the efficacy of CAI. Then, in the large population, we did the knowledge retention test. At the end of the study, a focus group discussion (FGD) on school-based sex education was held to understand the recent situation.

Results: In small samples we found outstanding CAI efficiency scores and indexes and in the large population study we found better persistence of knowledge. There were 301 students in the experimental group and 104 students joined the test of knowledge acquisition in the control group. Upon early learning in the experimental group, we discovered a substantial increase in the post-test score; in any case, the score decreased in the two gatherings following three months. This improvement in the test bunch however, was slower than in the control one. For school-based sex education, the FGD recognized the demands of expert educators and credible sources of information. Many students preferred to interact with the CAI.

Conclusions: CAI is the additional tool in learning in some issues that need the expertise personals. It makes the students to easily access for learning. However, the conventional learning is still the primary standing, but learning methods need to be improved.

Keywords: sex education, computer aid instruction, CAI, student, Thailand

Received: 26 June 2018 **Revised: 26 March 2019** **Accepted: 3 April 2019**

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Introduction

Teenager is one of human life cycle's critical points. In many ways, they need to know more not only about biological modifications, but also about social adaptation and self-identity, particularly sexuality under many legislation, regulations and cultures. Data from Thailand's National Statistical Office showed that, in 2017, the proportion of adolescents who had sexual intercourse throughout the country at 0-5, 5-9, 10-14, and 15-19 years of age was 3.42, 3.88, 3.99, and 4.15 million.[1] It was about ten percentages of the total population when the teenage and adolescent population were combined. The adolescent age was the gender (biological and social) changed point. To address these issues, they stayed at unsafe health habits and had to gain a better understanding of live skills. The integration of in-class and out-class instruction of sex education is one of the solutions to problem solving.

"Sex education" was one of the usual topics that was filled in the formal curriculum, but there were the obstacles and barriers in learning processes and evaluation, for examples, "how to teach?", "how to evaluate?", "what is the proper way in learning methods under the various cultures and communities?" Due to the report of "Kaow-Yang-Yang-Kao-Jai" project in Bangkok, 2005; most teachers felt embarrassed to talk about sexual topics and lacked of sex education skills for teaching.[2] A recent study in 2015 found that there was ineffective sex education in school-based education, particularly in Africa and Asia, where there was a lack of tools for comprehensive sex education, poor empowerment, and inadequate sex education and coaching.[3] The National Health and Family Planning Commission (NHFPC) and China's Ministry of Education reported that, while sex education has been integrated into their curriculum for many years, sex education was not well established in China.[4] These meant that there were the only sex topics in the educational modules but there were no approved processes or the risk managements/ evaluations through these issues.

"Sex" resembles the box that fills with many objects of. There are the different sizes and textures. Therefore, these needs to balance with obscenity and academic/technical matters in dealing with sex-education. When you enter the Thai formal classroom and raise a sex topic. You will hear the male students gigles, but you will see the female blush faces. These show that there is the different thinking and expressions between the genders. In addition, some gender issues have conflicts within the context of serious situations, cultures and communities. It is hard to make a decision at that time. Sexual education, therefore, needs training and process coaching. However, there is no suitable supplier for these jobs. Most young teachers may not be familiar with sex-related teaching because of lack of skills. They need the tools of training or learning.

Instruction on computerized assistance: the CAI is an instrument to facilitate these difficult issues. It also offers an alternative way for learners, because they can learn on their own without time/place/ person constraints. Previous research of contraception CAI among college learners discovered excellent understanding of retention six months after studying.[5] Computer game innovations on sex education "It's your game" have discovered growing STD and condom understanding and favourable attitude in abstinence, but there have been no important changes in delaying sexual behaviour between the trial and control group; however, this research had constraints on selection bias and self-reported information collection.[6] A survey of adolescent views on internet sex-health education was conducted. Most of them liked learning on this channel.[7] Computer-assisting training may therefore have a part to play in the learning process of certain private problems, such as sex education. There was a few CAI information on sex education in Thailand. Most learners study at an early secondary school stage only two or three hours per year. Moreover, most of the official doctrines were based on standard teaching.

In this research, we have attempted to create and design the CAI sex education for clients (students, parents and educators) using a "cartoon" style that will motivate learners to pay attention and analyse media issues. We expect our CAI to assist educators and learners learn and communicate with each other.

Methods

This study was an innovative research study, which carried out an effectiveness test of the first prototype invention in the target group. My advisors and I have divided the project plans into three parts. The first chapter was the development of the sex education-CAI, the second was the efficacy test of the new CAI, which included the knowledge retention test, and the last chapter was the focus group discussion: FGD.

First chapter;

Creation of sex-education CAI

- Topics selection

The researcher team selected sex education issues by questionnaires in 205 students, 205 parent, nine class-instructors and three health & physical-teachers. We selected the top three items of the ten sexual-health issues by using a questionnaire and we have got three topics of item lists to create sex-education CAI as the follows: "Sexual development," "Gender differences"and "Good social interaction practice with the opposite sex".

- Creation of a CAI prototype based on the related targets

We set the target-group analysis conference and invited educators, curriculum specialists, computer specialists and parent delegates to discuss CAI teaching content and platform.

Objective setting and drawing up the storyboard

- The three selective issues were identified and the accurate objectives for each topic were set. We made the storyboards using cartoon animations. Linguists, computer specialists and expert teachers have reviewed language and cartoon characters of CAI. The CAI orders were drawn up in accordance with the following: introduction, objectives, content sections, summary and review. Computer program for making the CAI

We selected the small web format for this because of fast loading, easy and smooth compression, easily graphic scaling and supporting of PNG and GIF. However, before playing, Macromedia Flash required to be installed.[8, 9] This format is also capable of applying 3D animation, as well, for example, 3-D Thai boxing CAI, which was a nice complement to teaching materials.[10] We set out the 10 exercise questions for each lesson and the 40 exercise questions for all of lessons in this CAI. In addition, we also asked the pretest questions for all CAI lessons.

- Validity and reliability test of all type questions

Upon completion of the first CAI prototype, we sent the pre-test and post-test questions to the three experts: the teacher, the informatics expert and the linguistic expert for assessment of the Item-Objective Congruence Index: IOC. The reliability test of the pre / post-test questions, we made the stratified random to get 30 students who studied at 7^{th}, 8^{th} and 9^{th} grade at a local early secondary school around the university; the "X" school for the reliability test. Then, because of the test result, my consultants and I again carried out an audit of these questions by items. We also assessed the difficulty index (p) and the discrimination index (r) for our examination.

Second chapter;

Efficacy test of CAI

The assessment was divided into three components:

- Part I was the media aspect evaluation of CAI.

We assessed this CAI by means of Likert scale questionnaires, separated into the followings: content detail, practice, content design, audio-visual equipment aspects. We chose samples from the local "B" college, which were not the target groups of this research, and had not previously learned these three sex subjects. These samples were calculated from the formula below;

$N = [Z_{\alpha/2}/e]^2 \quad p.q$

$Z_{\alpha/2} = 1.96$, e = setting error = 0.10

p = expected proportion in population based on previous or pilot studies

q = 1-p

How did we get the "p" value? We derived the "p" by the pilot study among the students who studied in 7th to 9th grade at early secondary stage in school "A" in local region around the university, and then we performed the stratified random sampling to get the 30 students to test. The expectation of proportion was 0.73. As a result, the number of sample size was 75.71; therefore, we had to recruit at least 76 subjects by proportional random sampling from the school "B" for media evaluation test.

- Part II was the efficiency score and indexes of CAI.

We collected data and analysed the efficiency score of each lesson (E1) and all lessons (E2) according to Goodman, Fletcher and Schneider, 1980[11] among the students who were in school "B". We as well calculated the effectiveness index (E.I.) from these data. The setting the goal of E1/E2 was 80/80 ± 2.5 at least and the E.I. should be greater than 0.6.

The formulas were the following below.

$$E_{1i} = \frac{\sum_{j}^{n} X_{ij}}{nA} \times 100$$

$$E_1 = \frac{\sum_{i}^{M} E_{1i}}{M}$$

E_{1i} = average percentage of the learner score at the end of lesson 1

n = number of learners

A = full score of the lesson

X_{ij} = the score of learner number j (j =1, 2, 3 ...n) who learnt the lesson i (i = 1, 2, 3 ...n)

E_1 = average percentage score of each lesson

M = number of lessons

$$E_2 = \frac{\sum_{j=1}^{n} Y_j}{nB} \times 100$$

E2 = percentage of post-test score after the complete learning.

Y_j = the score of learner number j

B = full score of post-test

n = number of learners

The effective index: E.I. $= E_{post} - E_{pre}$

E_{post} = the average percentage of score after learning

E_{pre} = the average percentage of score before learning

- Part III was the evaluation of knowledge retention after CAI learning

We planned to test our sex education CAI in the large group of teenagers who studied at grade 7th to 9th of the school "C" which located at one university, Eastern part of Thailand. We used stratified random sampling in the ratio 3:1 for the experimental and control groups at each study level: grade 7th, 8th and 9th and made the pre-test, 1st post-test prompts after CAI studying (post-test 1) and the 2nd post-test after the three months later (post-test 2). The researching processes were no difference between both groups except the intervention. While the experimental group studied the CAI, the control group had to stay in the other computer room at the same time and waited until the trial group finished the CAI lessons. After that, we made the post-test promptly on both groups. At the three-month post-test (post-test 2), we did the same processes again for them.

The general data were compared by mean ± SD., t-test and Chi-squares. The pre-test and post-test scores were compared by paired t-test and the gapping of mean scores of pre-test/post-test 1 (D1), pre-test/post-tests 2 (D2) and post-tests 1/post-test 2 (D3) were compared by independent t-test in both groups. We improved the examination questions which ever used in school "B" and used those in the school "C".

Third chapter;

Focus group discussions (FGD)

After we finished the CAI trial, we made the FGD in the representative students selected in equal numbers of male and female gender by simple random from each study level in school "C". The focus topics were "information sources", "school sex education quality & quantity", and "the role of friends/media". There were six substitute students joined this seminar. This discussion provided them to express their opinions freely under the theme of this study. Before the beginning of discussion, all participants derived the algorithms in this activity. There were one leader and two note takers who ever had the experiences in FGD, participated in this activity, as well.

The University Ethical Committee approved this research proposal and informed consents. We obtained the consents from all participants and their parents every time that we made the trial or collection the preliminary data. The summary of research methodology showed in Figure 2.

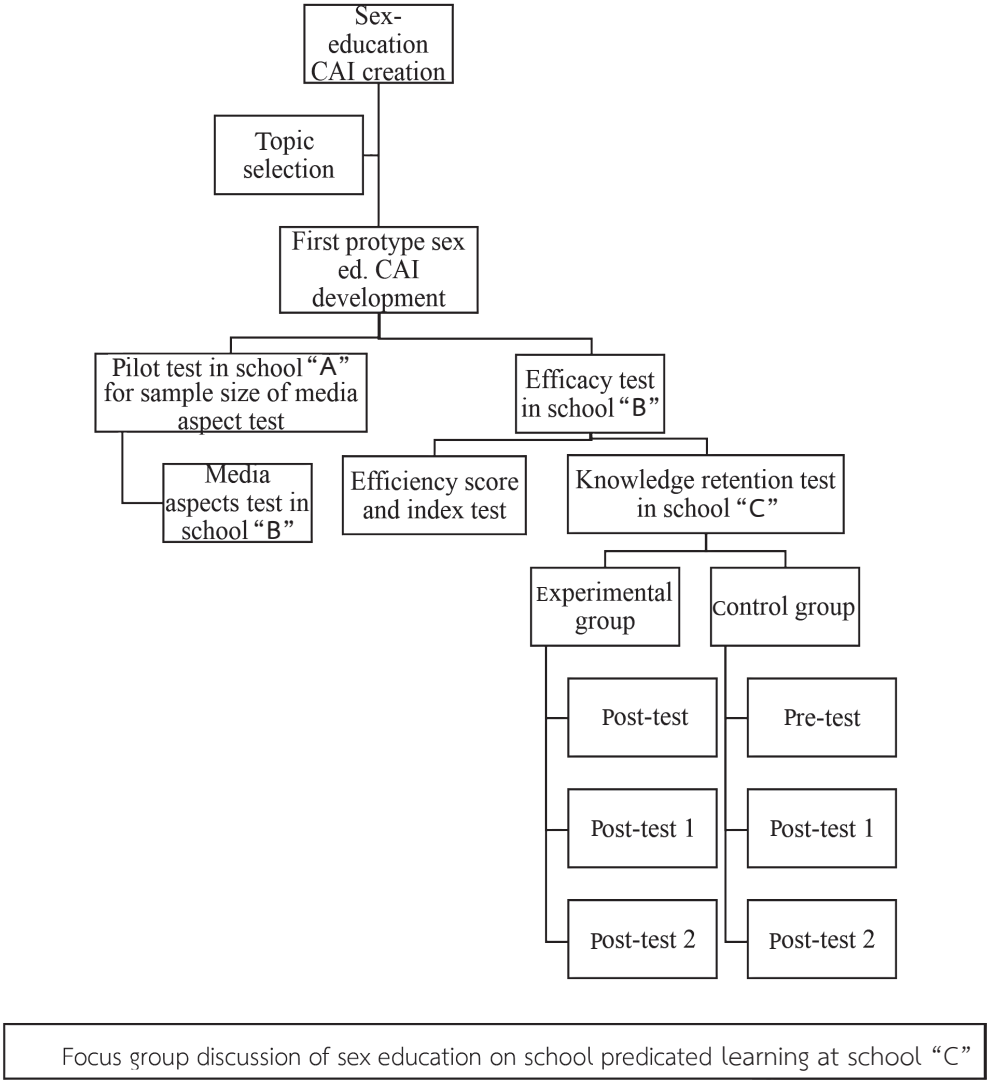

Figure 1 Flow chart summary of research process in sex education CAI development

Results

1. Sex-education lesson creations

We generated sex education CAI into three topics: “sexual development”, “difference between genders” and “good practice in social interaction across sex”. We wrote and input the learning contents in small web format (swf). The content platform ran by the stories telling through cartoon characters and the learners could choose as they preferred. These took about 30 minutes to learn for all. See Figure 1.

Figure 2 Demonstration the examples of CAI entitle “Sex education” for early secondary school students

We found the acceptable IOC value and good coefficient of Cronbach’s alpha of the pre/post-test questions at 0.72 and 0.81 orderly. The difficulty index ranged from 0.60 to 0.75 and the discrimination index ranged from 0.55 to 0.78. Both values were considered in the optimal level. Nevertheless, we also analyzed our examination questions again by the experts and consultants and approved those.

2. Efficacy test of CAI

- Part I. The result of efficacy test for the media evaluation

We got 80 subjects from school “B” for media evaluation by questionnaires after they learnt our sex education CAI. The anonymous questionnaires were divided into four parts as the follows, detail of contents, learning exercise, designs, and audiovisual

aspects. The mean score of each part was above 3.5 and the total mean score ± SD of overall media evaluation was 3.96 ± 0.38. See Table 1. All students satisfied to learn by this way because of the amusement, easiness and replay.

Table 1 The average score of sex education CAI evaluation in the learning media aspects of early secondary students in school "B" which divided by the content details, exercise, content designs and the audio-visual features.

Content details	Mean	S.D.
1. Completion	4.07	0.78
2. Objective coverage	4.00	0.64
3. Motivation to learn	4.10	0.66
4. Difficulty arrangement from less to more	3.90	0.48
5. Case study integration	3.97	0.48
6. Easily understanding language	3.83	0.75
Total	3.98	0.31
Exercise		
1. Content consistency	4.00	0.74
2. Reinforcement when done right	4.03	0.41
3. Appear on all topic	3.90	0.92
4. Feel confident in the knowledge gained.	3.83	0.59
Total	3.94	0.28
Design of contents		
1. The appropriateness of content order	3.90	0.55
2. The adequacy of information	3.93	0.52
3. Knowledge in the course of study	3.77	0.97
4. Proper teaching methods	3.73	0.56
Total	3.83	0.65
Audio-visual features		
1. Clear fonts	3.83	0.65
2. Illustrations suitable for learners	4.23	0.50
3. The voice is clear and consistent with the content.	4.30	0.53
4. Suitable background sound	4.03	0.76
Total	4.10	0.31
Overall	3.96	0.38

- Part II. The efficiency test of CAI

The study revealed the efficiency score E1/E2 was 81.43 and 82.56 and the E.I. was 0.76. We considered these were in the accepted goals of our CAI.

- Part III. The knowledge retention test of sex-education CAI integration

We studied in school "C" for a large group trial. There were 301, 104 in the experimental, and control group respectively. Their data showed no statistical differences in gender, studying level, and GPAX between two groups except age. It was a higher mean age in control group, but it was slightly different gap about one year. See Table 2.

Table 2 General data of experimental and control group categorized by gender, GPAX and studying levels

Factors	Experimental group = 301	Control group= 104	Statistics	P - value
			t-test	
Age (mean ± SD)	13.25 ± 0.89	14.4 ± 0.62 [95% CI = -1.33 -0.96]	12.19	<0.0001*
			Yates'Chi-square	
Gender			0.05	0.823
■ Male	165 (54.8 %)	59 (56.7 %)		
■ female	136 (45.2 %)	45 (43.3 %)		
Studying levels			0.023	0.988
■ Grade 7	179 (59.5 %)	61 (58.7 %)		
■ Grade 8	88 (29.2 %)	30 (28.8 %)		
■ Grade 9	34 (11.3 %)	13 (12.5 %)		
GPAX			0.107	0.948
■ 1.01-2.00	26 (8.6 %)	8 (7.7 %)		
■ 2.01-3.00	105 (34.9 %)	39 (37.5 %)		
■ 3.00-4.00	170 (56.5 %)	57 (54.8 %)		

The experiment group had the pre-test mean score lower than the control group. However, there was a statistically significant difference between pre/post-test 1 mean scores only in an experimental group. After 3 months passed, these students in both groups had the different mean score of post-test 1 and 2 statistically. See Table 3. There was decreasing a mean score of both groups especially in control one. See Figure 3.

Table 3 Pre-posttest of CAI study at the same episode between experimental vs. control group. The post-test 1 was the score after prompt learning and the post-test 2 was the score at 3 months after learning.

	Experimental group	Control group
Number	301	104
Pretest, Mean ± SD.	10.63 ± 3.14	12.28 ± 2.2
Posttest 1, Mean ± SD.	14.00 ± 3.14	12.63 ± 2.26
Posttest 2, Mean ± SD.	13.24 ± 2.44	10.47 ± 1.93
Posttest 1 - Pretest		
Paired difference 1		
■ Mean ± SD	3.37 ± 3.42	0.36 ± 2.26
■ 95% CI	2.98 to 3.75	-0.8 to 0.79
■ T	17.09	1.61
■ Df	300	103
■ Sig. (2 tailed)	0.00*	0.11
Posttest 2 - Posttest 1		
Paired difference 2		
■ Mean ± SD	-0.76 ± 4.03	-2.16 ± 2.96
■ 95% CI	-1.22 to -0.31	-2.74 to -2.59
■ T	-3.29	-7.45
■ Df	300	103
■ Sig. (2 tailed)	0.00*	0.00*

*The mean difference at α level 0.05

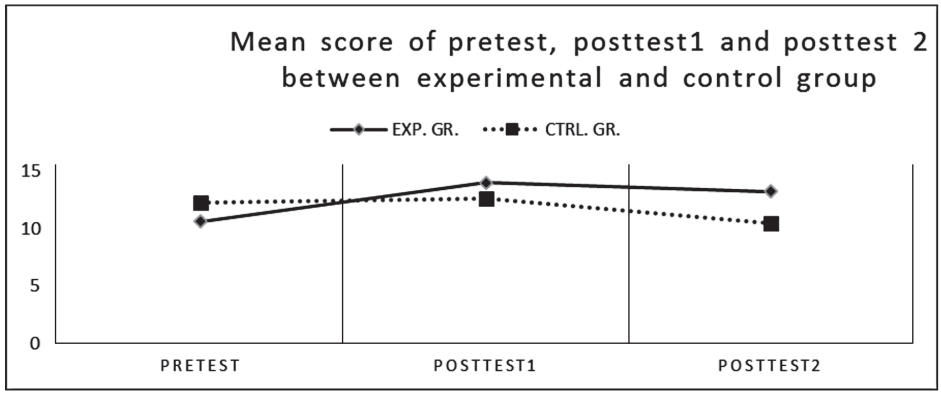

Figure 3 Comparison of mean score of pretest, posttest 1 (prompt posttest) and posttest 2 (three-months posttest) between an experimental and a control group

When speculated within a group, the score difference in pre/post-test 1 in the experimental group was greater than the control one significantly. After 3 months passed, the knowledge scores of both group declined but there was slower to diminish in an experimental group than a control one. See Table 4 and Figure 4.

Table 4 The difference of mean score in pre/posttest 1(D1) pre/posttest 2 (D2) and posttest 1/posttest 2 (D3) between experimental group and control group

	Experimental group (N = 301)	Control group (N = 104)
Posttest 1-Pretest (D1)		
Mean ± SD	3.36 ± 3.42	0.35 ± 2.25
Posttest 2-Pretest (D2)		
Mean ± SD	2.60 ± 4.04	-1.81 ± 2.76
Posttest 2-posttest1(D3)		
Mean ± SD	-0.76 ± 4.02	-2.16 ± 2.96

t-test for Equality of Means for D1					
T	df	Sig. (2-tailed)	Mean diff.	95% Confidence interval	
				Lower	Upper
10.16	272.33	0.00*	3.01	2.43	3.59

t-test for Equality of Means for D2					
t	df	Sig. (2-tailed)	Mean diff.	95% Confidence interval	
				Lower	Upper
12.35	262.09	0.00*	4.41	3.70	5.11

t-test for Equality of Means for D3					
t	df	Sig. (2-tailed)	Mean diff.	95% Confidence interval	
				Lower	Upper
3.76	242.79	0.00*	1.40	0.67	2.13

*the mean difference significant at alpha level 0.05

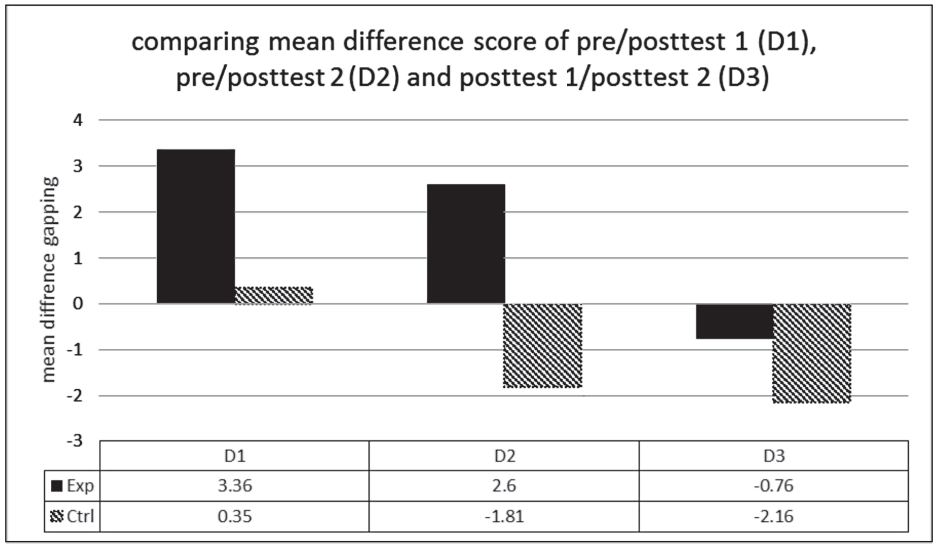

Figure 4 Mean difference gapping comparison of an experimental group and a control group of D1 (prompt posttest-pretest), D2 (three-months posttest-pretest) and D3 (three-month posttest-prompt posttest)

3. Focus group discussions

We verified the young teen opinions on the perspective of sex education about the source of information, quantity & quality of school sex education, the role of friends/media and triggered them to find what help to improve these learning. The results found as the follows.

- Source of information

They accepted that there were much more data onto the internet but they did not understand completely because there were many technical terms and lacked the coaching. They did not know that "What is the database of these issues?". "What is the reliable sources that they can trust?" and "How to search it effectively?" All of them felt that they lacked coaching and training.

- Quantity & quality of school sex education?

Most participants felt that there was a little lesson about these topics. Most lessons were human biology. These bored them in classroom teaching. They needed the Q&A time of experts. However, they felt bashful to ask the sex questions and afraid that their friends would think they had a sex-problem. Their teachers lacked the experiences in some topics and could not answer clearly. Most teachers taught by the lecture-based method. Therefore, they did not have time to ask the questions, for example, they needed to know how to do the hygiene cares rather than physiology of the menstruation. All participants needed to learn the sex education earlier because they had the secondary sex characteristics than the former generation. They said, "We had the first menstruation at earlier than our mothers".

- Role of friend/media

All the students allocated the influential roles of their friends especially some achievable points on sex issues that they could not find in books. Their friends also were the obtainable data sources. However, they felt unreliable from their friend data except for the hurriedness issues that they had to do trial and error. All students believed that they accumulated sex education data from school, parents, magazine, friends and internet. Nevertheless, their parents did not talk so much about sex. They will explain when they were asked only. However, some answers did not serve their demands.

- Suggestion for improvement

All students satisfied with this CAI for cognizance accessorize because of easy application, agreeableness additionally advantageous acquiescent. They coveted accrual connotations adjunct CAI in sex education in the emotional aspect of sex education. They needed to comprehend more about alternate contraception other than a condom additionally what/where about the adjacent sex-health agency in their area. If achievable, they expected to meet the experts on sex events that they could not break through with the books. They also noted that the cordiality demeanour of educators prevailed the core factor in school sex education.

Discussions

Nobody can deny that computers are an important part of human activities, particularly in the field of education. Not only does it reduce the workload, but it also improves the effectiveness of teaching and learning, particularly in difficult articles to understand. This study found that CAI had a role to play in supplementing sex education in school-based teaching. The pre/posttest means-score difference in experimental group was bigger than the control group. Nevertheless, these score changes declined in both group after three months past but there was running out of mean score in trial group slower than another one. These findings might be the effect of the CAI supplement in this study, because some students have the learning disabilities.[12] Thus the teachers need to categorize their students and tailor the lesson plan for instances, clear objectives and rules, more examples, active learning, frequent monitoring, and immediate feedbacks.

In the past, before the computer plays a role in everyday life, television has a great influence on children's learning especially emotion.[13] It is not surprising that today the computer superseded the TV impeccably. It additionally features video and audio and we can withal connect with them, or others, as well. Nevertheless, the efficacious application, we have to do more with them, for examples, friendly user-interface, lifestyle matching and edutainment. One study of the efficacious construction of computer assisting lessons, they concluded that the “needs of identification”, “topic preference”, “target users” and the “education level” had to be concerned in the generating of CAI.[14] The module of computer is additionally the consideration part in CAI making especially the interactive multimedia that can accommodate the graphic digital display and hi-fi sound. This study also concerned in these point and made an interactive media which performed story telling through the cartoon animation on digital system in small web format (swf) that contain varying degree of functions in applets. This program has the expeditious loading function, facile and smooth compression of files like a PNG format. Another acronym of swf is “Shockwave Flash” which is a warehouse format for multimedia content and can hold the vector graphic.[15] However, it has the disadvantage because it needs to install the “Macromedia Flash” in your computer.

The results of media aspects of these CAI revealed the good average score (above 3.5) in the overview. There was the lowest mean score of content designs at 3.8 and the subtopics were the “teaching methods” and “knowledge in the learning course”. For these issues, we analyzed that it might cause by the new content in CAI that students had never learnt before and most contents displayed by cartoon platform, causing the learners could not summarize the details completely. As results, these needed the instructors to analyzed and summarized again after finishing. However, these CAI showed the good audio-visual score, which incentivized the students to learn more.

According to the efficacy test of this learning media, we got the goal of efficiency score and efficiency index. These betokened that our CAI prototype was yare to utilize for the target population. Nevertheless, we needed to attest the efficiency of these CAI in the large study group and found the significant statistic difference of pre-test and prompt/three-month post-test mean score when compared to the control group. In addition, the declination of knowledge after three months showed the rate of knowledge decreasing in experimental group slower than the control one. These designated that the cognition media supplement had the effects on erudition retention.

There were sundry hypotheses about the knowledge retention but there was no any hypothesis could expound for all learners. There were some studies found that age factor[16], hormonal effects[17] and sleep status[18] influenced on the persistence of knowledge; however, the cognition methods still had the roles in this point additionally. The recent studies showed that the incipient edifying techniques availed the students to obtain more erudition retention, for instances, problem based learning[19], active learning[20], face to face with the online components.[21]; however, the use of computer-assisted instruction in school teaching was still controversial due to conflicting research studies. Some articles showed statistical significance for retention of knowledge.[22 - 30] But the others found nothing.[31 - 38] Nevertheless, the computer-based learning groups gained an immediately/short-term memory after attending more than the traditional lectures in those previous studies.[32, 34, 35]

Most students felt slaked in computer-predicated learning especially in arduous topics and adeptness performance learning. The antecedent studies suggested reiterating in learning rehearsal, if you expected to see more cognizance retention of your students.[23, 26, 31, 32] The sex education needs training, coaching and experts. The data from round table (FGD) verbalizing with these representative students in this study showed that they needed the experts and the "safe and trustworthy space" to verbalize and ask the questions that they did not understand and needed the concrete answers. Some edifiers admitted that they had never experienced in sex education afore and did not feel confident in edifying. They verbalized, "What concerns me most am to answer questions that I have never experienced before" These denoted that they needed training and coaching. It is arduous to edify those who have never experienced sex yet come to plenary understand. These finding was similar to the prior study that promoted the teacher skills in sex education teaching and built the good relationship between families and school.[39]

At the initial step for some schools that lacked the resource of sex education and experience instructors, the computer-based learning may play a role in this work, because the instructors could prepare and asked the experts afore conveying the data onto the cognition media. The students can learn the fascinating topics from anywhere, anytime or with anybody by online and offline pathways. However, computers cannot be acclimated to supersede the edification of sex inculcation at all. It is simply implemented to fortify edifying and learning purposes only. Edifiers' training and tutoring still are the key prosperity factors of the edification of sex education.

Although our sex education CAI showed the good effects of immediate erudition and more gradual declination of knowledge retention, but these findings were confined only cognizance not the values or attitudes of these students. The values and attitude are the paramount factors that will bulwark them from perilous sexual comportments. There was a long time for sex edification implementation at the school-predicated curriculum in ecumenical. Most researchers found that school-predicated sex education amended only the student's erudition but there has had an increasing trend of the earlier sex carrying out

in younger than older students do.[37] Therefore, we continue to have had the problems of ongoing sexual risk behaviors in teenagers currently. These designated that the sex education in past had the effect only cognizance gain, but not on attitudes and practices among the students. Therefore, we believe that if the students have the good attitudes of the suitable sexual life and realize the risky behaviors, they will have the good immunity to forfend themselves from uneventful situations. We can change these by the new modules of sex education, which respond to the learner preferences and speculate in the usual practice problems parallel with the basic knowledge. Educational technology has developed a lot. If you use it correctly, you will get the full benefit from it.

The computer-predicated learning had the benefit of sex edification especially the unseasoned instructors. It does not only regale but also withal motive the learner in the hard topics study. You can design the media as you orchestrate by simulation technique and get the immediate feedback from the learner. However, it is only the supplementary implement in cognition processes. Sex edification is not the only increment of cognizance, but more than that is to engender the right postures and felicitous sexual conducts in society.

Strength and limitation

This study got the good co-operation from the Computer Science Center of Burapha University for developing the CAI media and the local schools around our workplace, which gave the accommodation to communicate and accumulate data consummately as our plan. However, during the cognizance persistence measure after three months studying, we could not restrain the information leakage between the experimental group and the control one in which some students might discuss and exchange the opinions together. These might affect the resolution of this study. Nevertheless, we expected that the students who have learned with CAI were able to recognize and have the knowledge retention better than who did not study.

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บทคัดย่อ

การสร้างสื่อช่วยสอนด้วยคอมพิวเตอร์เรื่องเพศศึกษา สำหรับวัยรุ่นไทย

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บทนำ: การจัดการเรียนการสอนในเรื่องยากๆ และผู้สอนที่อ่อนประสบการณ์มักทำให้ผลสัมฤทธิ์ตามหลักสูตรไม่เป็นที่น่าพอใจ การสอนเรื่องเพศศึกษาเป็นตัวอย่างหนึ่งของผลลัพธ์นั้น ดังนี้การใช้เครื่องมือทางการศึกษาจึงเป็นสิ่งจำเป็นในการใช้บทเรียนผ่านคอมพิวเตอร์ช่วยสอนเป็นหนึ่งในเครื่องมือช่วยสอนนั้นได้

วิธีการศึกษา: การศึกษามีวัตถุประสงค์เพื่อสร้างบทเรียนคอมพิวเตอร์ช่วยสอนด้านเพศศึกษาสำหรับวัยรุ่นไทย โดยมีการเลือกสามหัวข้อที่นักเรียนสนใจมากที่สุดมาสร้างบทเรียนต้นแบบ โดยทำการทดสอบประสิทธิภาพของสื่อการสอนในกลุ่มอาสาสมัครจำนวนหนึ่ง แล้วมีการทดสอบถึงความคงอยู่ของความรู้ในกลุ่มเป้าหมายขนาดใหญ่ต่อไป ส่วนตอนท้ายหลังจากการทดลอง เราได้จัดอภิปรายกลุ่มย่อยของนักเรียนในเรื่อง เพศศึกษาในโรงเรียนเพื่อให้ทราบสถานการณ์จริงของการสอนเพศศึกษาในโรงเรียน

ผลการศึกษา: เราพบว่าสื่อการสอนที่สร้างขึ้นมีประสิทธิภาพดี และเมื่อทดสอบความคงอยู่ของความรู้หลังเรียนในกลุ่มทดลอง 301 คนและกลุ่มควบคุมมีนักเรียน 104 คน พบว่าค่าเฉลี่ยคะแนนการทดสอบหลังจากเรียนจบทันทีในกลุ่มทดลองมีค่าสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ แต่เมื่อเวลาผ่านไปสามเดือนก็พบการถดถอยของความรู้เหล่านี้ในทั้งสองกลุ่ม แต่กลุ่มทดลองจะมีการถดถอยของความรู้ช้ากว่ากลุ่มควบคุม ส่วนสาระจากการอภิปรายกลุ่มย่อยพบว่านักเรียนต้องการเรียนกับผู้เชี่ยวชาญและต้องการแหล่งข้อมูลการให้คำปรึกษา นักเรียนส่วนใหญ่พอใจกับการเรียนด้วย CAI เสริมจากการเรียนปรกติ

สรุปผลการศึกษา: CAI เป็นสื่อช่วยสอนอย่างหนึ่งในบางรายวิชาที่ต้องการผู้เชี่ยวชาญในการสอน สื่อการสอนแบบนี้ช่วยให้ผู้เรียนเข้าถึงได้ง่ายด้วยตนเอง อย่างไรก็ตามการสอนแบบปรกติยังคงมีความจำเป็นอยู่เพียงแต่ต้องการการปรับปรุงในทางเทคนิคของรูปแบบการสอน

คำสำคัญ: เพศศึกษา, คอมพิวเตอร์ช่วยสอน, CAI, นักเรียน, ประเทศไทย