



## Development of SCRIP Website with Automatic Fulfill System in Knowledge for Learners, Undergraduates' Computer Programming Principles Subject

Krisada Ploysri\* & Charun Sanrach

Faculty of Technical Education King Mongkut's University of Technology North Bangkok, Bangkok 10800 Thailand

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### Abstract

The objectives of this research were (1) to design the SCRIP online learning model, (2) to develop an SCRIP website with automatic fulfill system in knowledge for learners, undergraduates' computer programming principles subject and to meet the 80/80 efficiency criterion and (3) analyzing satisfaction towards the SCRIP website. The research procedures consisted of four phases: (1) creation of the SCRIP online learning model using EFR research technic, (2) development of SCRIP website with automatic fulfill system in knowledge for learners, undergraduates' computer programming principles subject, (3) analyzing the learning effectiveness and (4) analyzing satisfaction towards the SCRIP website. The sample group used in this research was technology and computer educator selected by purposive sampling from Faculty of Education of Rajabhat Rajanagarindra University that were registered in computer programming principles subject in the first semester of academic year 25017. The research instruments used consisted of interview form, evaluation form and questionnaire. The data were analyzed by using percentage, mean, standard deviation and statistics employed for verifying the efficiency of SCRIP website were the  $E_1/E_2$  index. The result findings were (1) SCRIP learning model consisted of three phases (1.1) collaborative learning (1.2) constructivist learning and (1.3) automatic fulfill the knowledge system that can respond to difference in individuals level of knowledge. The results of the evaluation from experts was at a good level, with the average of 4.28 (2) website with automatic fulfill system in knowledge for learners, undergraduates' computer programming principles subject had efficiency indices of 81.54/82.30 and (3) The result of analyzing satisfaction towards the SCRIP website was at a high level, with the average of 4.23. The results of the research showed that the website with Automatic Fulfill System in Knowledge for learners, undergraduates' computer programming principles subject based on SCRIP learning model was effective in the use of teaching.

\* Corresponding Author  
 e-mail: Krisada.p@gmail.com

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## Introduction

The modern technologies bring about many changes in society, including daily living, work, communication, education, learning styles, and texts or teaching in the classroom. Both communication and information sharing knowledge in the artshas developed rapidly making it difficult for the instructor to transfer the knowledge to all the students. The instructor must study and adapt to the teaching theory and to design the teaching to the changes of learners such as using the technology that learners are interested in as a tool or to motivate learners to engage. Students should have the ability to self-study from the information media with teamwork including social media and social network to apply in the development of teaching and learning. Bringing learners into a learning society that focuses not only on learning, but also on innovation, in order to enter a new teaching or learning system called education 4.0 which is the learning of the new generation in the digital age where the knowledge is floating on the cloud. This requires incorporating learning theories into the curriculum such as: 1) Behaviorism 2) Cognitivism 3) Constructivism (Poovarawan, 2014)

An education website is one powerful technology that can be a source of knowledge and can meet the needs of each student and also encourages students to access learning anywhere and at any time to enhance their future learning skills, including learning to study alone and learning that requires teamwork to succeed. By using an online technology that offers specific content that students do not understand automatically helps learners with different levels of knowledge to have equal opportunities to succeed in learning. Adjusting the content to suit the learner allows the instructor to have more time to care for the learner. The system will change the content to suit each student. (Kinshuk et al., 2002) Web-based instructional management using a tailor-made system, divided into three categories, a simple, easy-to-moderate format, can provide learners with a higher level of academic achievement than normal instructional methods. Statistics at 0.01 (Techatawewan, 2007) learning is focused on learners. Learning is meaningful and systematic. Taking into account the old knowledge. And links to new knowledge. Appropriate and direct to mainstream in educational website development. Learning through the context of web-based media, where the instructor is a facilitator, provides an environment for learning and social context that facilitates learning. (Khlaissang, 2011)

Collaborative learning can give all learners the opportunity to speak or express themselves. It is the most effective way to do this (Dachakupt, 2001). In a general classroom, it was found that when teaching, the teacher asked the whole class questions. There are five to six students who raise their hands. The instructor may ask the student to answer 2 to 3 questions, which represents only 10 percent of the class. Then the teacher summarizes the content. You can see that the rest of the students do not have the opportunity to answer both what they know and what they know more than volunteers. If the members are divided into groups, then the role of the speaker in the lead, the lead and the presentation will help students have the opportunity to learn more. Sharing and seeking knowledge improves the learning capacity of the group so that it can achieve its goals. Collaborative learning is student-centered learning using group processes and the type of learning improves academic achievement (Songkram, 2007). The study of learning achievement in the course information technology by cooperative learning had the results as follows: The students' learning achievement after group learning using STAD technique was higher than before. The students in group-based learning cooperated with the STAD technique. Each group achieved a high level of quality improvement. (Suayroop, 2013) STAD (Student Teams Achievement Divisions) is the cooperative learning technique that can be adapted to all subjects and levels. This is a learning technique that is widely accepted both in classroom learning and online learning. It can be applied to other cooperative learning techniques as well. (Tiantong, 2013) STAD has been used extensively in teaching, ranging from mathematics, art, language, education, and social studies, and is most suitable for instructional purposes. And the answer is the only answer is the only answer. Such as mathematical calculations application of geographical mapping language scientific map the STAD consists of key concepts in team teaching and learning activities (Robert E. Slavin, 2003). Based on the STAD technique, the students in the STAD group had higher cognitive abilities than those who studied by the teacher's manual at the .01 level, the efficiency of teaching mathematics was improved and increased the ability to solve math problems (Kamcharee, 2007).

Constructivist Theory, which is an essential learning tool for 21<sup>st</sup>-century learning, cannot wait for the instructor to be the sole provider. The concept that learning management should not be the only one but students and instructors should collaborate to create

learning, which includes the exchange of learning with share knowledge, skills and experiences together. Educators believe that knowledge is the ability of each learner to adapt existing experiences to new experiences. The Constructivist Learning Model (CLM) developed in 1991 by Robert Yager. CLM theory focus on learning by self-knowledge building. In accordance with the National Education Act, BE 2542 (1999), Section 4 Education Management,Section 22 Education must be based on the principle that all learners have the ability to learn and develop themselves and most importantly, the students are considered. The educational process must encourage the learner to develop naturally and fully according to the potential of knowledge creation through learning from practice (National Education, 1999). Learning with the traditional instructor is a learning method where the instructor is the informant and the learner is the recipient of the information. The more instructors provide information the students will gain more. It is not suitable for current conditions because the students did not learn and did not think for themselves. Learning management should provide learners and facilitators with interactive learning. Sharing knowledge and sharing of knowledge, skills and experiences together, learning is more effective (Tiantong, 2013). The introduction of constructivist theory to enhance engagement in reading and language proficiency from the study indicates that this research improves the student performance scores, especially for students with low readability (Sukavatee, 2007). The teaching style is integrated with cooperative learning and teaching activities on computer network. Theory and Constructivism are powerful models and can be applied to other subjects by comparing learning achievements between the experimental group and the control group. It was found that the experimental group had a significantly higher mean score than the control group at .01 and the satisfaction of the learners who had been taught in the computer network was higher (Simmattun, 2009).

Therefore, this research studied and developed a cooperative web site that promoted self-learning skills. The technology is an automatic learning support media that can respond to the differences in knowledge of the learner. To reduce problems in teaching and learning and acknowledging that basic knowledge of learners is not equal with different learning skills. At times the content is too much and the time spent teaching is limited. Another factor is the instructor cannot take care of or observe the students thoroughly.

## Objectives

1. Design the SCRIP online learning model
2. Development of SCRIP website with automatic fulfill system in knowledge for learners, undergraduates' computer programming principles subject and to meet the 80/80 efficiency criterion
3. Analyzing satisfaction towards the SCRIP website

## Conceptual Framework

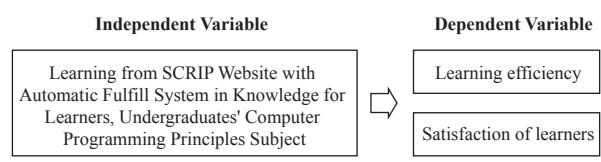


Figure 1 Conceptual Framework

## Research Methodology

### 1. Population and Samples

1.1 The research population included undergraduate students. The 52 students in this study used the entire population of students enrolled in Computer Programming Principles 3 (3-0-6) in the Faculty of Education, Rajabhat Rajanagarindra University. The 52 students were in the first semester of academic year 2017

### 2. Research Instrument

2.1 The web site was developed under the process of the Waterfall model and included the following: 1) the system of registration 2) the system of content presentation 3) the system of group learning progress 4) the system of collecting information of learners to fill the knowledge of learners automatically 5 Group and single job delivery systems. 6) Online examination system with pretest Quiz during class 7) open enrollment system and 8) test report and score system 9) student data collection system for analysis 10) And links to external content. The results of the tests and evaluation of the suitability for use in teaching and learning from the experts at the highest level. ( $\bar{x} = 4.84$ , S.D. = 0.35)

2.2 Computer Programming Course Developed according to the ADDIE design principles. 1) Objective 2) Content 3) Media such as additional content, images, videos and external information 4) Activity 5) Quiz.

2.3 Evaluate website SCIP. The research focuses on three main areas: 1) the design, 2) the SCIP system, and 3) the learning resources.

2.4 Content Evaluation and Learning Activities The researcher identified three main areas: 1) content 2) activity 3) test and then gave the expert. Then the test to find the quality. The results are as follows: Lessons and tests are consistent with the objectives. Reliability (0.89), Difficulty (0.24 – 0.80), Discrimination (0.30 – 0.61) and the results of the evaluation of the content of the expert test activities were at a good level. ( $\bar{x} = 4.12$ , S.D. = 0.58)

2.5 Satisfaction evaluation form for learners with website SCIP. Researchers identified four main areas: 1) content satisfaction and learning resources; 2) satisfaction with using SCIP learning system; 3) learning activity satisfaction; and 4) satisfied the instructor.

### 3. Collection of Data

3.1 Creating an online learning model using EFR research techniques. To collect data and expert opinions from 5 experts with a cumulative summation technique to find out the consensus trends for use in drafting the learning model. The model was used to evaluate the appropriateness of usage in teaching and learning by 15 experts.

3.2 The development of website SCIP of the Waterfall model is as follows 1) Analysis research and analysis of the main components of the online learning model and the functions of the modules are defined as well as types of storage 2) Design: The researcher designed the process of the module and the menu with different menu positions display style and wrote the work out Flowchart. The flowchart was generated and given to the expert programmers to validate. 3) Coding procedures for programming and select a language for website development. Researchers choose to use HTML, PHP as the primary language for website development and use MySQL as a database. 4) Testing was divided into 2 sub-steps: 4.1) System testing processed after the prototype of the site where the researcher tested to find errors from usage. Imported data collection of information into the database, processed and displayed. 4.2) Introduction of the course contents, computer program principles into the system to perform system testing, such as the registration system, student information collection system displaying exam content, quiz system, the system demonstrates learning progress based on cooperative learning STAD, fill in the missing

parts for the learners. (Improve Score Assisted), time-tested control system Scoreboard for instructors. In step 4, the test participants were divided into two groups. Those with intermediate and low level computer skills to verify the accuracy of the data results. The results of the tests were used to improve the system. 5) Maintenance the researcher adapted the work to the server efficiency to work for the availability of services to the sample students and prepared a manual for improving the structure of website writing and database structure.

3.3 The development of a computer-based instructional program in the design of an ADDIE lesson is as follows 1) Objective analysis, activity content, and test. 2) Design. The researcher designed the content in the media lesson, the activity and the SCIP model. The researcher produced the materials such as images, samples, media, teaching activities. 4) Steps to be taken. The researcher brought the developed lesson into a web page to test for errors and correct them. Then it was brought to the experts for review. 5) Evaluation process. The research was applied to the subjects in the first semester of the academic year 2014. There were 52 students enrolled in computer program. After completing the course, students will be asked to complete the assessment form.

3.4 Website SCIP evaluation and tutorials researchers. Researcher sent website SCIP and lessons to 10 experts for evaluation. The experts were divided into two groups, 5 technical experts, 5 content experts, 5 experts, and then the results were used as data for improvement with the sample students.

3.5 The sample consisted of 52 students enrolled in computer program principles in the first semester of academic year 2017.

### 4. Data Analysis

4.1 Analyze the website SCIP suitability assessment information. The students' satisfaction level was determined by using the five-level rating scale questionnaire. The mean and standard deviation. The mean score of 4.51 - 5.00 means most agree with the average of 3.51 - 4.50, which means that the average score is 2.51 - 3.50. Average 1.51 - 2.50 means less agree with average 1.00 - 1.50 means less agree

4.2 Analysis the SCIP website with automatic fulfill system in knowledge for learners, undergraduates' computer programming principles subject use the scores from activities during class. Quiz during class and post-tests using the E1 / E2 performance formula.

## Results

1. The design of the online learning model with EFR research. The online learning model has three main components: (1.1) collaborative learning process. (1.2) Self-learning and (1.3) Autonomous learning systems for learners that can meet learners' different knowledge. The experts checked factors and the assessment for suitability of the application from the experts gave an overall score of being good. ( $\bar{x} = 4.28$ , S.D. = 0.57)

2. Website SCRIP development are as follows.

2.1 Website evaluation results from technical experts and experts on the content, activities and quiz are detailed in Table 1.

**Table 1** Quality assessment results Computer Programming Principles

Expert Group Assessment Results	Mean	SD	Results
1. Experts assess the technical learning	4.80	0.31	Most agree
2. Experts on the content, activities and quiz	4.12	0.58	Most agree with average
<b>Average</b>	<b>4.46</b>	<b>0.44</b>	<b>The evaluation was good</b>

From Table 1 The results of the website SCRIP with an automated learning system for learners. The overall computer program was found to be at a good level. ( $\bar{x} = 4.46$ , S.D. = 0.44)

2.2 Performance of the website SCRIP with an automated learning system for learners. Computer Programming Principles Details are as show in Table 2.

**Table 2** Results SCRIP Website with Automatic Fulfill System in Knowledge for Learners, Undergraduates' Computer Programming Principles Subject

Number of students (N)	Process of efficiency		Overall performance				E1/E2
	score full (A)	score Average	E1	score full (B)	score Average	E2	
52	60	48.92	81.54	59	48.56	82.30	81.54/82.30

From Table 2 Results of performance analysis Website SCRIP is equal 81.54/82.30. This is based on assumptions set because the website SCRIP has been studied, designed and developed in a systematic way. With expert advice on technical issues, how to teach and content experts. As a result, learners have developed their skills and knowledge to achieve their objectives. Observation during learning activities and the scores

found good students understood the content well. Students will be able to explain their language by using the student's language, group competitions, and group-based thinking to help students learn more about specific activities. There is more help in answering questions in the classroom. As a result of the STAD collaborative learning process and self-learning process.

3. The results of the study on the satisfaction of the students with the website SCRIP consisted of 4 aspects as detailed in Table 3.

**Table 3** The results of the study on the satisfaction of the students with the website SCRIP

Sample	Mean	SD	Results
1. Content satisfaction and learning resources	4.27	0.59	Satisfaction is high
2. Satisfaction with using website SCRIP learning system	4.21	0.66	Satisfaction is high
3. Satisfaction of learning activities	4.17	0.61	Satisfaction is high
4. satisfaction of the instructor	4.25	0.64	Satisfaction is high
<b>Average</b>	<b>4.23</b>	<b>0.63</b>	<b>The overall rating was at a high level.</b>

From Table 3 The learners' satisfaction with the supplementary website SCRIP for the learners of the automatic course was very high ( $\mu = 4.23$ , S.D. = 0.63) and when it is considered that the. The most satisfied student is content satisfaction and learning resources and the satisfaction of the instructor.

## Discussion

1. Website development with self-paced learning based on the online learning model. Computer Programming Principles the efficiency is 81.54 / 82.30, because the website has been designed and developed in a systematic way. They have been instructed and evaluated by the technical experts of the website. And experts evaluate the content of the test activities. As a result, the learners succeed in learning the goal sets effectively. With a cooperative learning process that is competitive, collaborative research is possible and students are able to help each other in answering more questions. Automated learning system for learners can meet the differences in the knowledge of the students wellas and help students achieve success faster. This is consistent with the research, reviewing the learning with the feedback and the ability to correct errors in learning a second languageby providing written feedback for

second language learning. The results indicate that when students use the data warehouse as a feedback to correct errors, students are more likely to correct errors. There are important steps to be taken such as specifying the type of error and giving prompt feedback which can affect learning success (Crosthwaite, 2017). Based on this research, it is in line with the knowledge-based online learning model that online tutorials will collect the wrong answers and then send the correct content to the learners. It also coincides with the study of comparative learning to solve high-complex algebra problems through collaborative learning and individual learning processes. The results from the comparison of these two learning processes indicate that Individual learning is better than collaborative learning when using working examples to solve problems appropriately. On the other hand, experiment 2, learning problem solving with research as a collaborative learning is more effective than individual learning. It concludes that even collaborative learning is beneficial when learning is under the solution. However, it may be a barrier to studying the sample work (Retnowati, 2017).

2. Satisfaction of learners from website SCRIP and self-learning. Computer program in general has the average score of 4.23. The website has been developed and tested to meet the needs of the students. Content is sorted from simple to hard. The resources provided allows students to have more education options. Both from the inside and outside content of the web site including learning activities and job submission can be done online. This is consistent with the research on website development, knowledge based on early childhood education. The students' satisfaction level was at the high level. (Kamharnsoontorn, 2016)

## Suggestion

1. Enhance the ability to fill up knowledge with the help of machine learning. This helps the learner and keep the learner's information to analyze the differences in the knowledge of the learners, then link them with the knowledge of the learners together.

2. Some of students want to get all the content from the system. It will be brought to the conclusion of the study. The solution is to use group processes to share information that they have with others.

3. The upload system should be added to the group's archive to store information during the activity. No other group can view the data or make a copy before

getting permission.

4. Web-based teaching can be applied to many subjects. Website SCRIP should be applied to other courses.

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