Development of a Smartphone-assisted English Reading Instructional Model for English Major Students in the Northeast of Thailand

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Abstract

Reading is considered as the most important skill for English learners (Komiyama, 2009) because it is one of the imperative skills which play an important role for educational and professional achievement. However, it is demonstrated that the proficiency level of English reading amongst Thai students are unsatisfactory and needed to be improved (Laoarun, 2013; Ponmanee and Sinsuwan, 2001; Wongsothorn, 2003, and Chawwang, 2008). Today, Smartphone is becoming an appropriate tool to be used in educational contexts. Because of its powerful features and services, learners can access to content anyplace, anytime. It also offers the greatest potential for integration of technological hardware into language learning (Barrs, 2011). Nevertheless, to create an effective instruction, an Instructional Systems Design (ISD) process must be applied as guidance for developing instruction step-by-step. For this reason, this study aims at developing a Smartphone-assisted English Reading Instructional Model (SAER Instructional Model) for English major students. To construct the SAER Instructional model, the five effective and practicable instructional design models were analyzed and synthesized precisely. Consequently, the Model was evaluated by the three experts in instructional systems design and English language teaching field. The results of the experts' evaluation toward the SAER Instructional Model revealed that the Model is appropriate in English reading instruction for English major students in the Northeast of Thailand.

Keywords: Instructional design, instructional model, teaching reading, mobile learning

1. Introduction

Reading skills in English has long been perceived as being crucial in the context of a globalized world (Rahman, H., 2007). It is believed that people with a high potential in reading skill are more likely to be successful in both education and professional achievement. However, English seems to be a recurring problem for Thai students at all educational levels and most students reading abilities are not good enough to understand what they read (Songyut, 2011; Wichadee, 2011).

A number of research studies on reading in Thailand revealed that reading ability in English of Thai students were fairly poor (Laoarun, 2013; Ponmanee and Sinsuwan, 2001; Wongsothorn, 2003, and Chawwang, 2008). Accordingly, language scholars and instructors are presently exploring to find the teaching and learning methods which can effectively improve students' English reading ability and increase their motivation in learning reading. To resolve this problem, smartphone technology which is a high potential and influential tool will be integrated in reading teaching approach to assist in the facilitation of learning.

Moreover, the instructional design which is a systematic procedure for instruction development will be applied to construct a well-organized instructional model. As a result, a study on how to design and develop an English Reading Instructional Model which is an integration of smartphone technology into English reading course which will help enhance students' reading ability and motivate students to read should be carried out. To achieve the research purpose, two research questions have been formulated:

1) What are the components and logical steps of developing a smartphone-assisted English - reading instructional model?
2) What are the experts' opinions on smartphone- assisted English reading instructional model based on an evaluation form?

2. Review of Related Literature

To design and develop the SAER Instructional Model, four learning theories consist of Behaviourism, Cognitivism, Constructivism, and Social constructivism learning theory, the relevant instructional design models that laid the importance of the design of the SAER Instructional Model including ADDIE model, Dick and Carey model, Kemp model, SREO model and OTIL model, the knowledge of smartphone technology, and the seven steps Model for research and development proposed by Brahmawong & Vate-U-Lan, 2009 were carefully reviewed, analyzed and synthesized.

2.1 Learning Theory

To create effective learning environments based on mobile devices, several learning theories concerning mobile-assisted language learning have to be studied. Accordingly, four learning theories which will be applied in the development of instructional model for smartphone-assisted English reading will be reviewed.

2.1.1 Behaviourism Learning Theory

Behaviorism is a theory of learning based upon the belief that all behaviors are acquired through conditioning. Therefore, by this theory learning has occured when learners evidence

the appropriate reinforcement of an association between a particular response and stimulus (Smith and Ragan, 2005). In behaviourist perspective, mobile devices can be adopted as an effective way of learning to enhance the behaviourist learning process. The use of mobile devices to present teaching materials/content, and specific questions, elicit responses from learners, provide appropriate and immediate feedback, and provide drill and feedback activities fits within behaviourist learning paradigm.

2.1.2 Cognitivism Learning Theory

Cognitivism is defined as the acquisition of knowledge and skill by mental or cognitive processes — the procedures we have for manipulating information 'in our heads'. The underlying concepts of cognitivism involve how we think and gain knowledge. Thus, based on this theory learning is the acquisition or reorganization of the cognitive structures through which humans process and store information (Good and Brophy, 1990). Accordingly, based on cognitivism belief, teachers can use mobile devices not only to create a motivational climate within learning process with incorporated diverse teaching philosophies that promotes learning but also tolerate students to learn differently at various developmental levels.

2.1.3 Constructivism Learning Theory

Constructivist learning theory maintains that "knowledge is not received from outside, but that we construct knowledge in our head" Alessi and Trollip (2001) (p. 31). Based on this theory, learning is an activity process in which learners construct new idea or concepts based on their current and past knowledge (Bruner, 1966). In the implementation of mobile technologies, Constructivist learning theory allows students to work independently and have a teacher as a facilitator. Sooner or later, students learn more when they have to explore and experiment rather than being told why something works.

2.1.4 Social Constructivism Learning Theory

From a social constructivism perspective, knowledge is constructed whenever people engage socially in talk and activity about shared problems of tasks (Driver et al., 1994). Based on the belief that cultural and social context are influencing learning, thus leaning can be occurred through social interaction. In view of that, the use of mobile technology to connect rather than separate students from one another would be very appropriate use in online learning.

2.2 The Instructional Design Model

As this study aimed at developing a smartphone-assisted English reading instructional model, thus, the knowledge of instructional design which is a systematic procedure for instruction development is necessitated to review. Therefore, five instructional design models including ADDIE model, Dick and Carey System Approach Model, Kemp Model, SREO Model and OTIL Model will be pragmatically studied.

2.2.1 The ADDIE Model

The ADDIE model is a generic and systematic approach to the instructional design process which provides instructional designers with a framework in order to ensure that their instructional products are effective (Dick, Carey and Carey, 2001). The model consisted of

five stages, namely, Analysis, Design, Development, Implementation and Evaluation. It is considered the most commonly used system for instructional design and is the basis of instructional systems design (ISD).
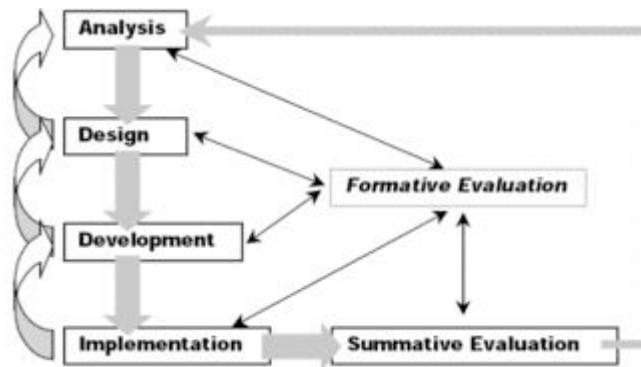

Figure 1. The ADDIE Model

2.2.2 The Dick and Carey Model

The Dick and Carey model is one of the most influential Instructional Design system-oriented models. Similar to other ISD models, its system bears the conventional core elements of ADDIE model. Differently, the five core elements of ADDIE model is broken down into more complex steps (see Figure 2).
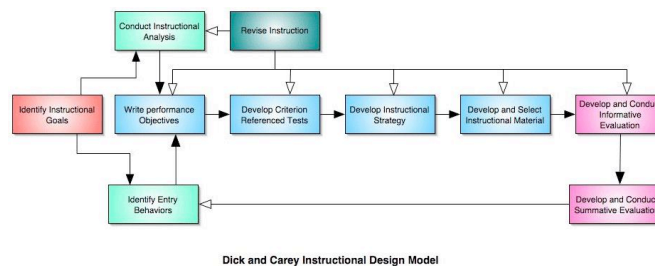

Figure 2. Dick and Carey Model

2.2.3 The Kemp Model

The Kemp Model is one of the most widely used models in the field of instructional design. It defines different elements (Morrison, Ross & Kemp, 2004) of an instructional design, and emphasizes the adoption of continuous implementation and evaluation through the instructional design process. The nine elements of the Kemp Model are independent of each other. The model is systemic and nonlinear, arranged in an oval pattern and seems to encourage designers to work in all areas as appropriate (see figure 3).
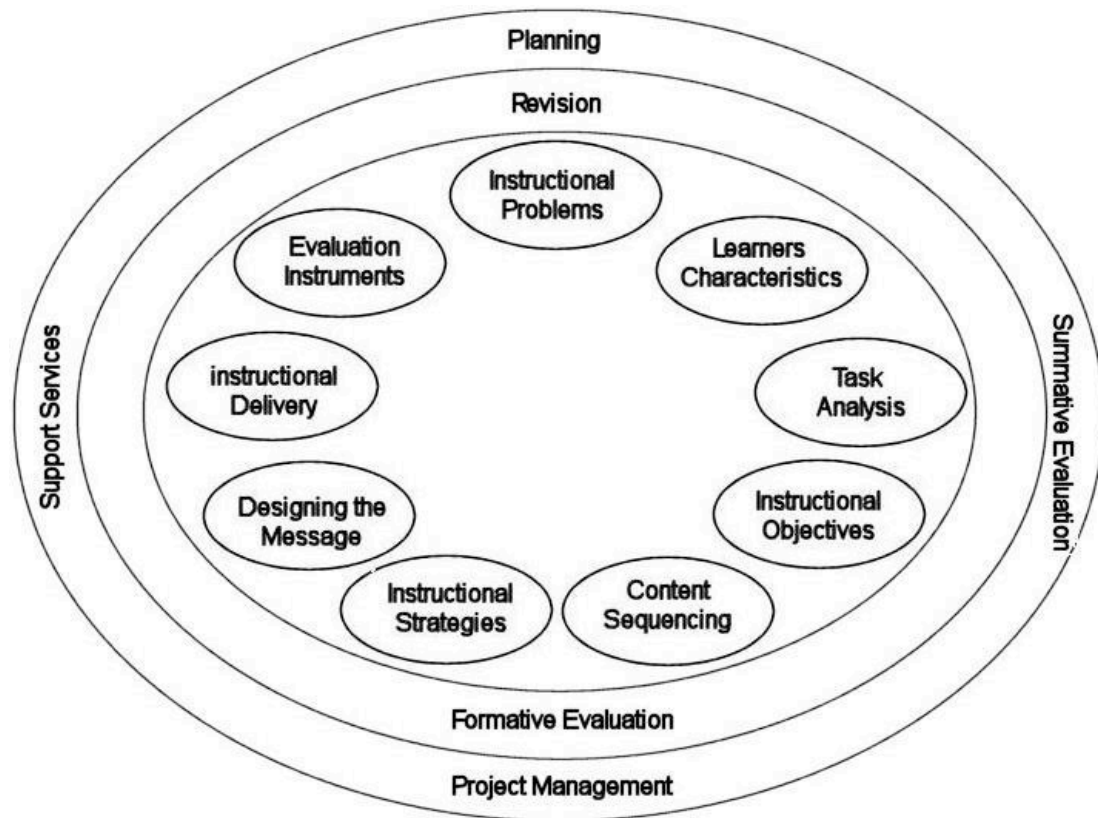

Figure 3 Kemp Model, from Morrison, Ross & Kemp (2004)

2.2.4 The SREO Model

SREO Model is an Internet-based instructional system for language teaching which focuses on interactivity or interaction involving learners with the content (Tian & Suppasetseree, 2013). This model considered instructional design issues for E-learning: structure, content, motivation, feedback, interaction, and involvement. It comprises six main steps namely, analyze setting, construct prototype, produce instructional packages, test prototype, conduct teaching and learning activities, and conduct evaluation (see figure 4).
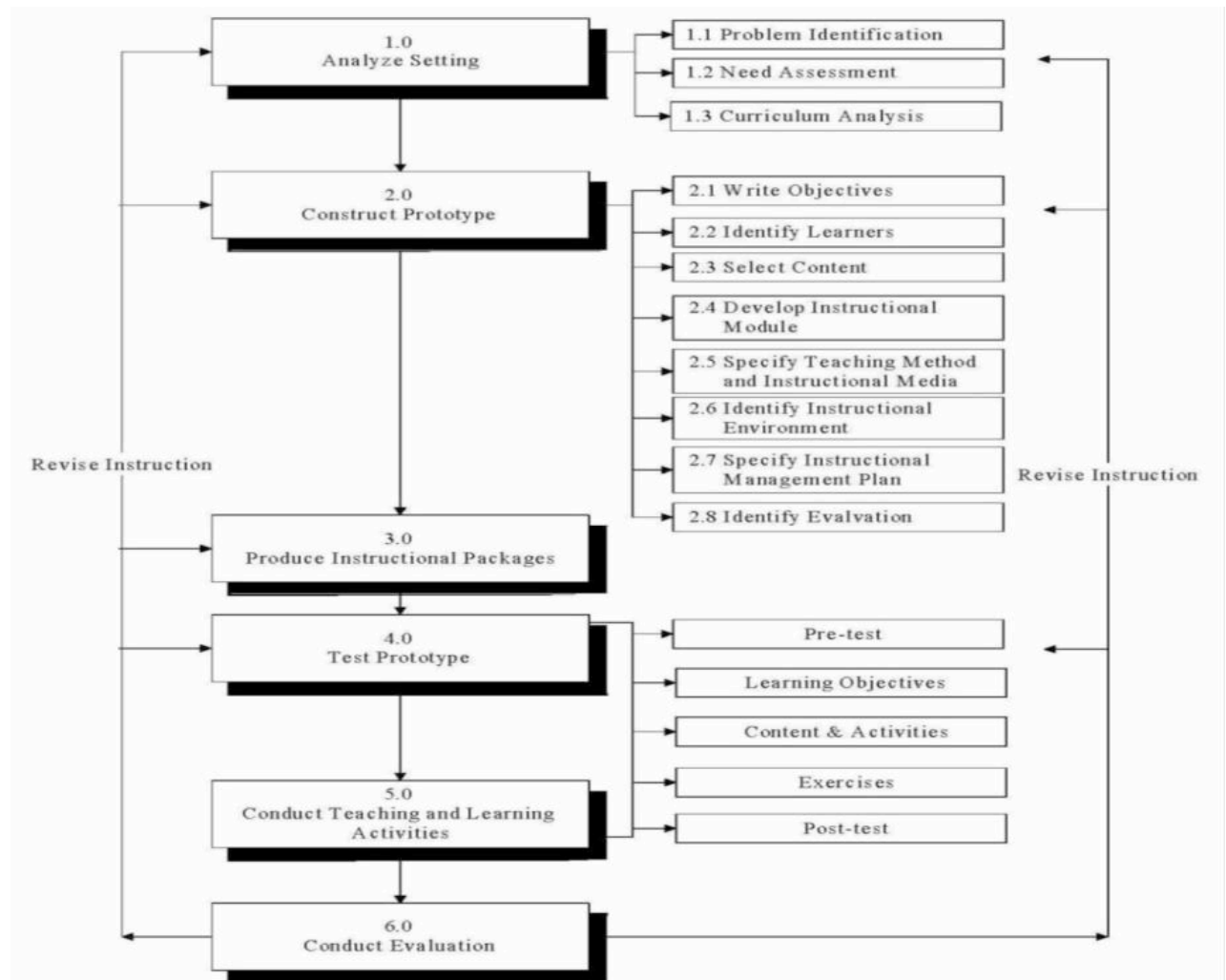

Figure 4. SREO Model (Suppasetseree, 2005, p. 108)

2.2.5 The OTIL Model

The OTIL is an acronym for Online Task-Based Interactive Listening. The orientation of the OTIL Model is systematic and web-based, using interactive listening instruction with task-based approach. This model includes 6 phases and 17 steps in the process (see Figure 5).

2.3 Smartphone Technology

The usage of smartphones has grown extensively over the last years, and so has the services and a numerous applications offered to the users (Cedergren and Hellman, 2012).

Multi-functionality, portability, and connectivity are opening doors for learning. These tiny pocket computers keep students connected to the Internet, improving their academics. Thus, learning does not only happen inside the classroom, it can happen anywhere anytime. With the high potential of smartphone, learners access to a great deal of content, and transfer or share information online with a study group anywhere, anytime. Accordingly, smartphone technology opens up the opportunity to learn all the time.

2.4 Brahmawong's Seven Step Model

The seven steps Model for research and development was proposed by Brahmawong & Vate-U-Lan in 2009. This model comprises consistent seven steps as follows: step 1) reviewing a knowledge on SAER instructional model; step 2) conducting need assessment for SAER instructional model (SAER Model); step 3) developing conceptual framework for SAER instructional model; step 4) Securing the experts' opinion on SAER Instructional Model; step 5) drafting the prototype of SAER model; step 6) trying out the prototype and, step 7) revising and reporting on SAER model.

3. Research Methodology

This study consisted of two phases. At the first phase, the Instructional Model of Smartphone-Assisted English Reading would be designed and developed. In this phase, the literatures which are applied in the SAER Instructional Model will be reviewed. Afterward, the Instructional Model of Smartphone-Assisted English Reading will be designed and developed. In the second phase, to evaluate the smartphone-assisted English reading instructional model design, the evaluation form of efficiency of the Smartphone-Assisted English Reading Instructional Model will be sent to the three experts in Instructional Systems Design and English Language Teaching field. The information gathered from the evaluation will be used to revise the model.

4. Results

After the study had been conducted, the two research questions which were demonstrated previously were answers as follows:

4.1 Design of the Samrtphone-Assisted English Reading Instructional Model

Based on the results of the evaluation and the recommendations from the three experts, the SAER Instructional Model has been carefully revised. Eventually, the model was developed in 8 majors steps and 9 sub-steps in the process. Each step will be briefly described as following:

Step 1: Analyze Instructional Context

Analysis is the basis step in the SAER Instructional Model. Before the instructional process is designed, the 4 subjects will be clearly analysed by the researcher: (1) analyse learners including needs and problems regarding learning English reading, and their characteristics. (2) analyse learning context for SAER Model, (3) analyse teacher' role and availability in smartphone-assisted learning courseware and, (4) analyse instructional content of reading I cousre used in the courseware. The information gained from this stage can contribute to identify the learning goals of reading courseware in the second stage.

1.1 Analyse learners

In this substep, needs and problems of the leraners concerning learning English reading and their characteristicts will be examined. The analysis emphasises on the background knowledge and learning problems students had and encounted while they were studying English reading and the expectation of the learners from learning English reading. The findings of this analysis can subsidize to identifying learning goals and determine instructional strategies which promote learners to make connections with new information to old.

1.2 Analyse Learning Context For SAER Model

To do a better job of planning instructional activities, the analysis of learning context where the actual learning will take place is conducted. The purpose of this sub-step is to identify the availability of smartphones devices for English instruction providing by the university and any limitations of the setting that might affect the design of instruction.

1.3 Analyse Teacher' Role And Availability for Reading Courseware

Study of online teacher roles and competencies are important as they provide information about how online teachers might be trained and supported, as well as factors that might affect the design of online learning environments. Thus, this sub-step teachers' role and availability that the teacher need to perform while teaching reading courseware will be specified.

1.3 Analyse Instructional Content of Reading Courseware

One of the important factors which can impact up on how the instruction is designed and developed is types of content. As different types of content will likely require dissimilar strategies, thus, analyze the instructional content of reading course should be conducted. The content analysis focuses on analysis of the domain (type) and level (sequence) of the content.

Step 2: Identify Learning Goals of Reading Courseware

After the analysis, the learning goals of the reading coursewear is necessitated to specify. The findings from step 1.0 can influence the goal statements. A clear statement of what the instructional goals of the course will help determine the pathway to develop the smartphone-assisted learning courseware and diminish deviancies during the corse development.

Step 3: Design and Develop for Smartphone-Assisted Learning Courseware

After identifying the learning goals of the reading coursewear, in this step the lessons, exercises and assessments which will be accessible in the instruction must be developed. To affirm that the lessons, exercises and assessments of the online instruction are in a holistic approach that mean everything fits together in hamony, the blueprint of the reading couseware must be considered.

Step 4: Develop Instructional Strategies

Based on the blueprint of the reading courseware from step 3.0, the instructional startegies will be developed following the 3 substeps: (1) determine instructional startegies, (2) create learning tasks and, (3) select online instructional platform.

4.1 Determine Instructional Strategies: Learner-Centered Approach

It is stated that what children learn depends not only on what they are taught but also how they are taught (Instructional strategies online, 2013) accordingly, to achieve the learning goals of reading course, the applicable instructional strategies must be cautiously determined to maximize learning effectiveness. Therefore learner-centered appoarch, consequently determined as the main instructional strategy in the smartphone-assisted English reading instruction. It will be covered following areas: Pre-reading activities; Reading, and Post-reading activities.

4.2 Create Learning Tasks For Pre-Reading Activity, During-Reading Activity and Post-Reading Activity

After instructional strategy is determined, the learning tasks which are influenced the accomplishment of the instruction of smartphone-assisted English reading courseware must be considered and created. The design of applicable tasks possibly will have significant influence on the success of the reading instruction.

4.3 Select Instructional Platform: Smartphones

Based on the results of the previous steps, in this substep the online instructional plateform which will use to deliver the lessons have to be selectively chosen. In an online environment, the plateforms should be selected in order to expand accessibility to educational opportunities, make use of multimedia capabilities, and provide effective management of the teaching and learning experience. As the online reading instruction focuses on self-organized learning and social networking, smartphone devices, a platform which can serve the notion of learning anytime anywhere will be applied as online instructional platform in this reading courseware.

Step 5: Produce the SAER Lessons

Once the instructional platform is picked up, the actual reading courseware which will use for teacher and student need to be cautiously produce in this step. However, this step is somewhat time consuming because the suspected instructional material is possibly changed or amended and the new instructional material may be able to adopted or added to make the courseware much more effective.

Step 6: Developmental Testing

To test the efficiency of the SAER lessons, in this step the tryout and the trial run processes will be carried out.

6.1 Tryout

In this substep, to test the effeciency of the SAER lessons, three steps of the tryout will be carried out: individual testing, small group testing and field testing.

6.1.1 Individual Testing

In this stage, the three students will learn through the reading English lessons produce on the SAER Instructional Model. The time allotted for this step is 15 fifty- minute periods. Results of the tryout will be analyzed to find out the efficiency of the SAER lessons based on the 80/80 efficiency criterion. Tryout data on the opinions of the students concerning the quality of SAER lessons will be utilized to improve the quality of the model.

6.1.2 Small Group Testing

In the small group testing, 6-12 students will be asked to study through the SAER lessons which are modified and revised from the individual testing stage. Results of the tryout will be analyzed to find out the efficiency of the lessons based on the 80/80 efficiency criterion. The lessons will be further improved based on the students' opinions of the concerning its quality.

6.1.3 Field Testing

Similarly to the individual and the small group test, in this stage thirty students will be asked to learn through the SAER lessons. After that, Students' achievement scores of both exercises and tests from three stages will be determined for effectiveness of the smartphone-assisted English reading lessons based on criteria of the 80/80 standard level (Brahmawong, 1978).

6.2 Trial Run

In this step, the learning context where the actual learning will take place is conducted. The actual reading courseware will be given to the thirty students. Before and after studying The SAER lessons, all of them will be asked to do the pre-test and post-test respectively. Results of the trial run will be analyzed to find out the efficiency of the lessons based on the 80/80 efficiency criterion. The comparison of pre and post acheivement scores of students who used the SAER lessons will be investigated as well. Eventually, the lessons will be further improved based on the students' opinions of the concerning its quality.

Step 7: Implementation SAER Lessons
Once the SAER lessons is approved to be proficient and satisfaction, the implementation step will be conducted to ensure that maximum efficiency and positive results of the lessons are obtained. Design evaluation is also done in the implementation step.

Step 8: Conduct Evaluate
Afetr the implementation step, evaluation process is conducted in order to evaluate learning processes and outcomes. Accordingly, two types of instructional evaluation which are formative evaluation and summative evaluation will be conducted in this step.

4.2 Results of the Experts' Evaluation toward the SAER Instructional Model

After SAER model had been developed, to prove that the SAER model constructions are appropriately apply in the study the evaluation form of SAER model was submitted to three experts in Instructional Systems Design and English Language Teaching field. The data collected from a five-point rating scale questionnaire was calculated for arithmetic means. The results of the analysis are presented in table 1.

Table 1. Results of Experts' Evaluation toward the SAER Instructional Model

No	Statements	$\bar{X}$	SD
1	The components of SAER Model are appropriate.	4.33	0.577
2	The steps in SAER Model are clear and easy to implement.	4.33	0.577
3	Each component in SAER Model has appropriate connection.	4.67	0.577
4	The SAER Model Plan is appropriate to be used in teaching Reading I course	4.33	0.577
5	The SAER Model can help enhance learner-teacher interaction.	4.00	1.000
6	The SAER Model can help enhance learner-learner interaction.	4.00	1.000
7	The SAER Model can offer combining learning activities with self-paced study.	4.67	0.577
8	The SAER Model can offer practicing with associated feedback.	4.00	1.000
9	The SAER Model can offer personalizing learning paths based on learners' needs.	4.67	0.577
10	The SAER can facilitate students to learn anytime anywhere.	4.67	0.577
11	The SAER Model is appropriate for current social condition.	4.67	0.577
	Total	4.39	0.197

According to the results in Table 1, it revealed that SAER model was rated by the experts at the mean score ($\bar{X}$ = 4.67, SD=0.577) in items 3, 7, 9, 10 and 11, the mean score ($\bar{X}$ = 4.33, SD=0.577) in items 1, 2, 4 and the mean score ($\bar{X}$ = 4.00, SD=1.000) in items 5, 6, 8. Due to the findings, it was demonstrated that the mean score of all items are at ≥ 4.00.

This can be explained that the experts strongly agreed that 1) the components of SAER Model are appropriate; 2) the steps in SAER Model are clear and easy to implement; 3) each component in SAER Model has appropriate connection; 4) the SAER Model Plan is appropriate to be used in teaching Reading I course; 5) the SAER Model can help enhance learner-teacher interaction; 6) the SAER Model can help enhance learner-learner interaction; 7) the SAER Model can offer combining collaboration activities with self-paced study; 8) the SAER Model can offer practicing with associated feedback; 9) the SAER Model can offer personalizing learning paths based on learners' needs and using simulation and games; 10) The SAER can facilitate students to learn anytime anywhere, and 11) the SAER Model is appropriate for current social condition. In total, the results revealed the mean score of 4.39 (SD=0.197) which indicated that the SAER Model was in good organization for the purpose of the study.

5. Discussion

Reading skills in English has long been perceived as being crucial in the context of a globalized world (Rahman, H., 2007). People with a high potential in reading skill are more likely to be successful in both education and professional achievement. Nonetheless, a number of research studies on reading in Thailand revealed that reading capacity in English of Thai students were fairly poor.

As a result, effective reading instructional models have been constantly developed to improve students' English reading ability. A Smartphone-Assisted English Reading (SAER) Instructional Model was also designed and developed to serve as a guideline for teachers to create applicable instructions.

The SAER Instructional Model has been constructed based on student-centered approach with the modern ideas of learning anywhere, anytime and individual differences through smartphone technology. Once five instructional design models comprise of ADDIE model, Dick and Carey model, Kemp model, SREO model and OTIL model were reviewed, analyzed and synthesized, the SAER Instructional Model was developed systematically following the seven steps Model for research and development proposed by Brahmawong & Vate-U-Lan (2009).

After a prototype of the instructional model was designed and developed, it was submitted to three experts for evaluation and suggestions. As a whole, the results of the evaluation revealed that SAER Instructional Model was approved as a well-organized and sequenced instructional model which appropriately used for EFL reading instruction and capable of enhancing students' interactions and combining learning activities with self-paced study at anytime anywhere ($\bar{X}$ = 4.39, SD=0.197).

With regard to each aspect of the model, the findings revealed that 6 items including Item 3, Item 7, Item 9, Item 10 and Item 11 received the highest mean score ($\bar{X}$ = 4.67, SD=0.577). This indicated that the strongest point of the model was the component of the model which was connected appropriately. That means if the instructional components are properly allied with each other, the quality of the instructional design is higher (Martin, 2011). This view, possibly because the model was designed and developed on the fundamental principles of instructional system design with insightful studies of various instructional models.

Also, the learning activities with self-paced study, personalizing learning paths based on learners' needs and facilitation of students for learning anytime anywhere in current social condition were declared as the distinctive point of the model as well. This view, possibly because the model was designed and developed based on constructivist learning theory that puts emphasis on self-organized learning, social networking, and the changing roles of teachers.

Nevertheless, the three aspects of the model: enhancing leaner-teacher interaction, enhancing learner-learner interaction and offering practicing with associated feedback, all obtained the lowest mean score ($\bar{X}$ = 4.00, SD=1.00) from the experts. Perhaps this view was because the SAER Instructional Model was designed and developed based on the conception of self-organized learning through social networking with the role of teachers were changed; instead of being teacher, they turn to be facilitator.

As a result, it possibly that the interaction between teacher-learner; learner-learner will be gradually reduced. However the notion of cognitive theory suggests that high level of interaction in learning environments can improve learning outcomes and increase student satisfaction. Therefore to design and develop an effective online learning course, the instructional designers should find a way to intensify leaner-teacher interaction and learner-learner interaction in online course.

The results of evaluation of SAER Instructional Model were mostly consistent with those of many previous studies: Suppasetseree's (2005) SREO Model, Tian's (2012) OTIL Model and Walakanon's (2014) WCR Instructional Model in which one of the strongest points of all these models including SAER Instructional Model is its systematic connections between the components of the model.

Conversely, the results of evaluation also revealed the variances amongst these models in which while all these models placed importance on students' autonomous learning, which allow the students to study online at their own pace and according to their interests (Walakanon, 2014), SAER Instructional model slightly different placed importance on students' ubiquitous learning, in which students can become totally immersed in the learning process at anytime, anywhere with self-paced study.

6. Implications

The implications of the study can be mentioned as follows. First, the SAER Instructional Model contributed in the present study will be used as an authoritative example or a guidance to other instructors and instructional designers who are interested in further development of the instructional model in which the smartphone technology is integrated. Second, the SAER Instructional Model contributed in the present study can also help promote reading activities in settings outside classroom.

That means it can establish a ubiquitous learning environment in which students can be motivated to learn whenever and wherever they want both outside and inside reading classroom and provides more opportunities for learning to read as well. According to its potential, learning activities can be occurred across time and space no longer limited to specific formal settings.

7. Conclusion

To construct the SEAR instructional model, concept, principles, reading theories, learning theories related to mobile learning, instructional design models together with Brahmawong's Seven-Step Model for research and development were precisely reviewed and analyzed to design and develop the model. After that, the model was pragmatically created and carefully evaluated by the three experts. According to the experts' suggestions, the model was revised and eventually approved as the well-organized instructional model which is applicable and suitable for EFL reading instruction in current social condition.

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