

## THE USE OF SMARTPHONE GAMES AS MEDIA FOR NON-FORMAL EDUCATION MANAGEMENT TO STRENGTHEN THE SELF-ESTEEM OF TEENAGE DROPOUTS

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### ABSTRACT

This research had objectives (1) to construct instructional media in the forms of smartphone games for non-formal education management to strengthen the self-esteem of teenage dropouts and (2) to study the effects of using smartphone games for non-formal education management to strengthen the self-esteem of teenage dropouts. It was conducted using the one-group pretest-posttest design in the pre-experimental research design. The sample consisted of 12 teenage dropouts who were purposively selected. The interview population consisted of two experts in non-formal education, an expert in psychology and a technology expert in game design. The instruments were composed of a structured interview form, a recording form of the focus group, lesson plans, smartphone games, a behavioural observation form of the self-esteem, a form of diary record, and the self-esteem scale. The data from the interviews and the focus group were analyzed in terms of the content analysis, whereas, the data from the behavioral observation form of the self-esteem, the form of diary record, and the self-esteem scale were analyzed in terms of the descriptive statistics such as frequency, percentage, average mean, standard deviation, and difference between the average means. The comparative results between the average self-esteems before and after the experiment showed that the average self-esteems in each dimension after the experiment were higher than those before the experiment in all five dimensions. As the results from the behavioral observation form of the self-esteem, the form of diary record showed that 66.70-100.00 % of those 12 teenage dropouts who participated in the experiment had the self-esteems in all five dimensions at the very-good level.

**Keywords:** Self-esteem; Teenage dropout; Learning media of smartphone games; Non-formal education

## 1. INTRODUCTION

Nowadays in Thailand, social and economic conditions result in that lots of teenagers in the schooling system drop out due to various problems such as poverty, family problems, personal adjustment, being arrested or involved in criminal cases, sickness, accident suffering, family migration, and working to support family, and so on [1]. There are various impacts of the dropping out problems such as 1) on the teenagers themselves that they lack the knowledge required for living; that they have negative attitudes towards education; that they lack self-confidence and they lack educational opportunities for self-development; 2) on the government budget and educational costs that the free education provided is waste and that the government have to provide more for the social problem-solving; and on the Thai society that the teenage dropouts may have violent behavior or may have committed various crimes in society [2].

According to the results from the Promotion Program of the Officials Promoting the Student Conduct in 2018 suggesting that those teenagers without any activities are likely to hang around game stores as the first type of places [3] which is consistent with the report by The Office of Electronics Transaction Development [4] on the Survey of the Internet Use in Thailand in 2016, the most popular activity among the teenagers is playing games online on smartphone. One of the reasons why these teenagers turn to playing games is that they have the low self-esteem [5]. They are likely to have fun and satisfaction towards the success of playing games to meet their prides [6]. Therefore, learning management through games should be the most suitable choice for these teenagers to learn which leading to have higher self-esteem [7].

The self-esteem is the self-thinking and feelings in a person through both negative and positive self-assessment to judge his/her own values through cumulative data from his/her experiences or from others. The self-esteem gives rise to self-respect, self-rejection, feeling of self-worth in society, self-reliance, and the recognition of his/her own family and community leading to his/her own success or failures in life [8]. The self-esteem matters the development of being an adult; children with low self-esteem or self-negative feelings are comparatively like the disabled of personality leading to failure in all areas of life [9].

Due to the importance of strengthening the teenagers' self-esteem (SE) and the teenagers' interest in playing smartphone games (SGs) as mentioned above, the authors are interested in researching the use of the SGs as the learning media (LM) for non-formal education management (NFEM) to strengthen the SE of teenage dropouts (TDs) in order to have guidelines for the SE development among the teenagers who are growing to be the human resources of quality of society in the future.

## 2. OBJECTIVES

This study was aimed as follows:

1. To construct learning media in forms of smartphone games for non-formal education management to strengthen the self-esteem of teenage dropouts, and
2. To study the effects of using the smartphone games for non-formal education management to strengthen the self-esteem of teenage dropouts.

### 3. CONCEPTUAL FRAMEWORK

The conceptual framework can explain the process of creating a gaming smartphone to enhance the self-esteem of the dropout teenagers. This research was conducted based on important theories, namely: Knowles' Theory of Andragogy for self-directed learning, Piaget's Developmental Psychology of Adolescents for self-identity and self-esteem, Rosenberg's Theory of Self-esteem for self- good feelings, self-respect, self-positive attitudes, self-capabilities, and self-feeling of achievement as well as the concepts related to gaming smartphone design, games in terms of competition, challenges, fun and imagination, and Malone's Theory of Game-based Learning. The created game was used to organize five activities to enhance self-esteem in all five aspects. The related theories were summarized as shown in the conceptual framework in Figure 1.

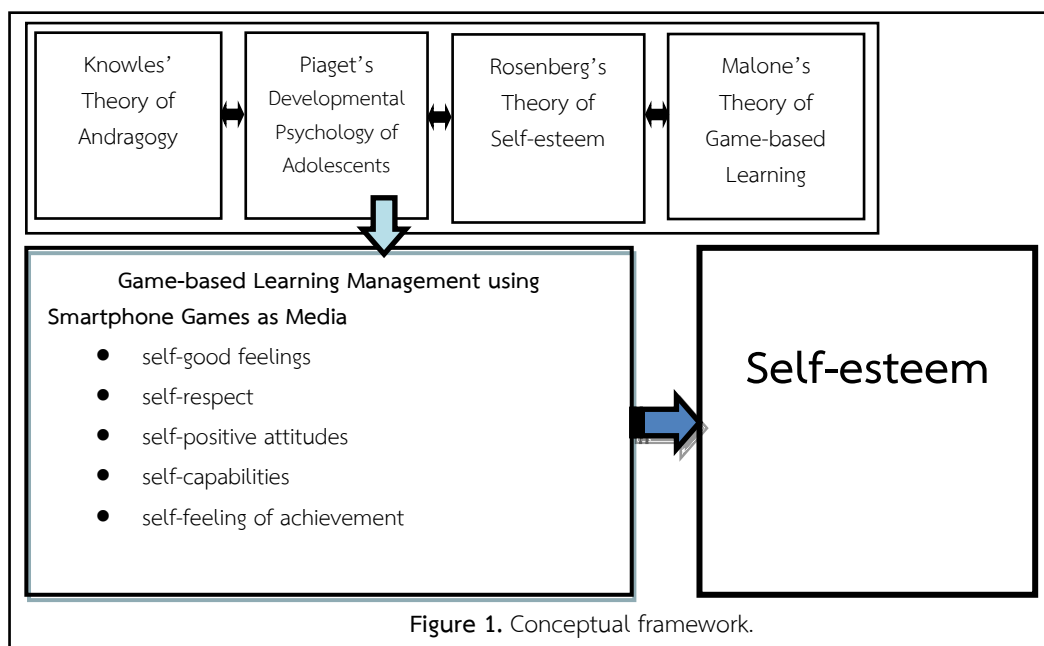


Figure 1. Conceptual framework.

### 4. METHODS

This research was undertaken through the mixed methods of the qualitative research approach and the pre-experimental research approach in order to completely achieve the objectives.

#### 4.1 Research Procedures

Phase 1: Construction of the SGs and the lesson plans.

4.1.1 Data from experts' interviews and the focus group of the TD were to be collected for constructing the SGs.

4.1.2 Construction and quality determination of the SGs were to be done.

4.1.3 The five lesson plans and the document supplementary to the lesson plans were to be created.

Phase 2: Try-out of the SGs for NFEM to strengthen the SE of TDs.

4.2.1 The learning media of the SG was to be taken to try out among those TD in the experiment.

4.2.2 The SE of the TDs was to be measured.

## 4.2 Populations and Samples

4.2.1 As for the qualitative research, data were collected from the samples as follows:

4.2.1.1 The interview population consisted of two experts in non-formal education, an expert in psychology, and technology experts in game design.

4.2.1.2 The focus-group population consisted of eight TDs aged between 15-19 years old playing in the game stores in Kitchakute district, Chanthaburi province.

4.2.2 As for the pre-experimental research, data were collected from the sample of 12 TD aged between 15–19 years old playing in the game stores in Kitchakute district, Chanthaburi province, who were purposively selected and voluntary to take part in the experiment.

## 4.3 Tools

In this study, the following tools were used:

4.3.1 The structured interview form to collect the data from the experts to construct the SGs.

4.3.2 The recording form of the focus group including topics about playing games to be summarized and collected from the focus group to construct the SGs.

4.3.3 The lesson plans constructed by the corresponding author to manage the learning using the SGs.

4.3.4 The behavioral observation form of the SE constructed by the corresponding author to record the behaviors of the experimental group.

4.3.5 The form of diary record constructed by the corresponding author for the experimental group to record their feelings after the learning through the smartphone game of each lesson plan.

4.3.6 The SGs used as the LM for the NFEM to strengthen the SE of TDs.

4.3.7 The SE scale, translated Thai version adapted from the standard version by Rosenberg [10] to measure the SE of the experimental group before and after the use of the SGs as media for NFEM to strengthen the SE of TDs.

## 4.4 Construction and Quality Determination of the Tools

4.4.1 The structured interview form which was constructed by the corresponding author to collect the data for construction of the SGs was composed of three open-ended questions (for free answers) about 1) the SGs suitable for teenagers, 2) the theories related to the teenagers' SE, and 3) the design and construction of the SGs to strengthen the SE among the teenage dropouts.

4.4.2 The topics in the recording form of the focus group which were designed and specified by the corresponding author to guide the focus group to obtain the useful data for the construction of the SGs to strengthen the SE among the TDs were about 1) behaviors of the teenage dropouts, 2) features of the SGs wanted by the teenage dropouts, and 3) duration of playing the SGs.

The structured interview form and the topics of the focus group were submitted to the thesis advisor to determine the validity of the language expression and the consistency with the objectives and then they were revised according to the recommendations before using to collect data.

4.4.3 The five lesson plans, which were constructed by the corresponding author for NFEM to strengthen the SE of teenage dropouts, applied the Knowles' Theory of Andragogy [11] together with the Piaget's Developmental Psychology of Adolescents [12] for the teacher's roles; the Malone's Theory of Game-based Learning [13] for the design of the SGs suitable to the TDs and the Rosenberg's Theory of SE [8] for

the design of the SGs to strengthen the teenage dropouts' SE in five dimensions including self-good feelings, self-respect, self-positive attitudes, self-capabilities, and self-feeling of achievement and each learning plan took 90 minutes to learn.

4.4.4 The behavioral observation form of the SE constructed by the corresponding author to record the behaviors of the experimental group including general behaviors and the SE behaviors in five dimensions: self-good feelings, self-respect, self-positive attitudes, self-capabilities, and self-feeling of achievement.

4.4.5 In the form of diary record constructed by the corresponding author for the experimental group to record their feelings after the learning through the smartphone game of each learning plan, there were two open-ended questions including the first one was about what obtained after joining the activity and the second one was about the feelings of the SE in five dimensions: self-good feelings, self-respect, self-positive attitudes, self-capabilities, and self-feeling of achievement.

In order to determine the quality of the lesson plans, the behavioral observation form and the form of diary record, the Index of Item Objective Congruence (IOC) was used to determine the content validity in terms of the consistency with the research objectives and all these three tools were submitted to the thesis advisor and three experts each in non-formal education, psychology and technology. As a result, the IOC of each item was equal to one which meant that all these three tools were valid in terms of their contents and appropriate to be used. Finally, the recommendations were followed before using in this study.

4.4.6 The SGs which were constructed to be played on smartphones of the Android operating system were based on 1) the Rosenberg's Theory of Self-esteem [8], 2) the data from the structured interview with the panels, and 3) the data from the focus group undertaken the TDs and were developed and constructed step by step as follows:

4.4.6.1 Specify the objective to use the SGs as the LM for NFEM to strengthen the SE of the TDs and the name of them as "SE-ROSEN".

4.4.6.2 Create their structures and contents in terms of plot, content, and language which use appropriate and up to date for the sample group according to recommendations by the experts in psychology whereas the detailed instructions on how to create them were recommended by the experts in technology.

4.4.6.3 Based on the results from 4.4.6.2, write codes of instructions for them, set how to play them together with rules and choose the Android operating system together with instruction set (Software), integrate C program, then bring the game plots to create graphics.

4.4.6.4 Set off constructing them.

4.4.6.5 Revise SGs according to the comments from trail session.

The resulting content design results in a smartphone game based on the advice of psychology experts and the advice of tech experts and the advice of tech experts are as shown in Figure 2.

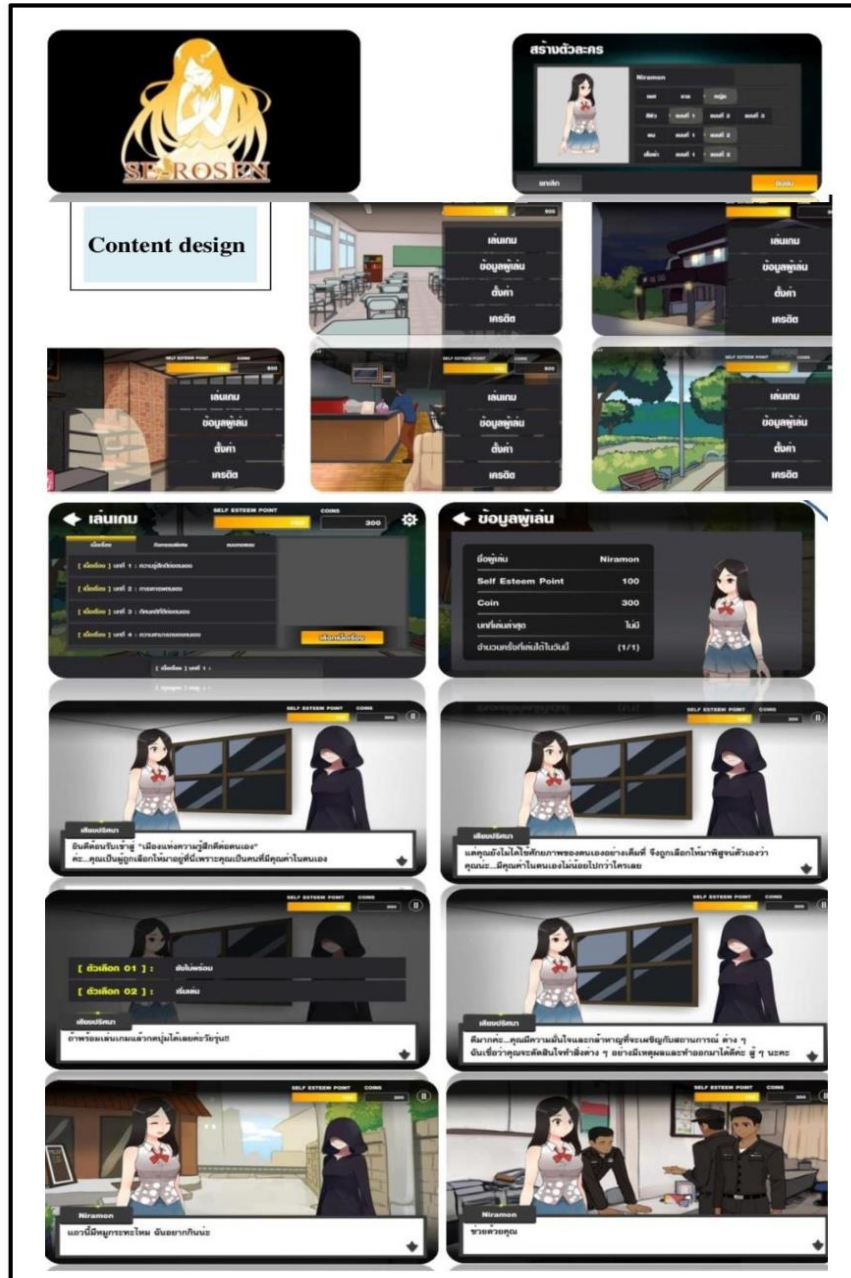


Figure 2. Smartphone games.

4.4.6.6 Write a guide how to play them as the offline games to played on smartphones of the Android operating system.

4.4.6.7 Evaluate them by the try-out of them with the 15–19 years old TDs other than those selected to be the experimental group and improve them according to the evaluated results.

All SGs together with their construction steps were submitted to the three experts of each in non-formal education, psychology, and technology to determine the content validity in terms of the consistency between the content and the study objectives including usability of instruction, menus, language used suitable for players, beautiful and attractive pictures, and etc; measured by IOC. As a result, the IOC of each item was equal to one which meant that all these SGs were valid in terms of their contents and appropriate to be used.

4.4.7 This scale translated and adapted from the standard one of Rosenberg [10] was composed of 10 items of each rating scale including strongly agree, agree, disagree, and strongly disagree.

The SE scale which had been already translated into Thai was submitted to the expert panels including an expert in psychology and two experts in NFEM to determine the appropriateness of the translated SE scale for use with the TDs and the consistency index showed the range of 0.67-1.00, which was considered that the SE scale developed by the author can be used.

#### **4.5 Experimentation and Data Collection**

This pre-experimental research design was conducted following the one-group pretest-posttest design [14] and the procedures were as follows:

4.5.1 All 12 participants (teenage dropouts) in the experimental group were measured by the SE scale [10] before the experiment and the results were kept.

4.5.2 The NFEM using the learning plans and the SGs was done in five learning sessions of 90 minutes each period and once a week for total 450 minutes.

4.5.3 During each learning activity in the NFEM in 4.5.2; the SE of each participant was observed and recorded through the behavioral observation form by the researchers.

4.5.4 Meanwhile, after each learning activity, each participant was also asked to observe and record his feelings and opinions about through the form of diary record.

4.5.5 Again, all 12 participants (TDs) in the experimental group were measured by the SE scale [10] after the experiment and the results were taken to compare with those in 4.5.1.

#### **4.6 Data Analyses**

Results from the comparison between the SE before and after the experiment were analyzed in terms of the descriptive statistics such as frequency, percentage, average mean, standard deviation, and difference between the average means. Results from the behavioral observation were analyzed and classified in groups according to behavioral features of the SE and from the form of diary record of each TDs were analyzed and classified in groups according to the five dimensions of the Self-esteem. Moreover, the number of the TDs reflecting the SE was also analyzed in terms of percent.

### **5. RESULTS**

The results are as follows:

#### **5.1 Results from the Construction of the LM of the SGs to Strengthen the SE of the TDs**

The summarized results from the interviews from two experts in NFEM, an expert in psychology and an expert in technology, from the focus group held among 15–19 years old dropouts in game stores in Kitchakute district in Chantaburi province and from the contents of the Knowles' Theory of Andragogy [11]

together with the Piaget's Developmental Psychology of Adolescents [12], the Rosenberg's Theory of SE [8], and the Malone's Theory of Game-based Learning [13] were synthesized and resulted in as follows:

5.1.1 The LM of the offline SGs in the Android operating system were in detail as follows:

5.1.1.1 a smartphone game to strengthen the SE in dimension of self-good feelings,

5.1.1.2 a smartphone game to strengthen the SE in dimension of self-respect,

5.1.1.3 a smartphone game to strengthen the SE in dimension of self-positive attitudes,

5.1.1.4 a smartphone game to strengthen the SE in dimension of self-capabilities, and

5.1.1.5 a smartphone game to strengthen the SE in dimension of self-feeling of achievement.

5.1.2 The lesson plans for NFEM to strengthen the SE of the TDs were composed of 5 learning plans for each dimension as follows:

5.1.2.1 the lesson plan for using with the smartphone game to strengthen dimension of self-good feelings spent 90 minutes to organize the learning activity,

5.1.2.2 the lesson plan for using with the smartphone game to strengthen dimension of Self-respect spent 90 minutes to organize the learning activity,

5.1.2.3 the lesson plan for using with the smartphone game to strengthen dimension of self-positive attitudes spent 90 minutes to organize the learning activity,

5.1.2.4 the lesson plan for using with the smartphone game to strengthen dimension of self-capabilities spent 90 minutes to organize the learning activity, and

5.1.2.5 the lesson plan for using with the smartphone game to strengthen dimension of self-feeling of achievement spent 90 minutes to organize the learning activity.

5.1.3 The behavioral observation form, the form of diary record and the SE scale adapted from the standard version of Rosenberg [10].

## 5.2 Results from the Use of the SGs as the Media for NFEM to Strengthen the SE in 5 Dimensions of the TDs

5.2.1 Comparative results between the SE averages before and after the experiment as show in Table 1.

**Table 1** Comparative Results between the SE Averages before and after Using the LM of the SGs for NFEM to Strengthen the SE in five Dimensions of the TDs.

Dimensions of the Self-esteem	Total scores	Before participating in the learning activities		After participating in the learning activities		$\bar{X}$
		$\mu$	$\sigma$	$\mu$	$\sigma$	
Self-good feelings	100	31.75	2.45	66.08	2.64	34.33
Self-respect	100	28.25	2.30	67.25	2.49	39.00
Self- positive attitudes	100	30.17	2.59	67.83	2.52	37.66
Self-capabilities	100	29.75	2.45	64.33	1.87	34.58
Self-feeling of achievement	100	31.25	2.60	66.08	2.31	34.83

The results above showed that the dropouts' SE averages of using after the experiment are higher than those before in all dimensions. The difference of the SE before and after showed the higher averages in all five dimensions as follows: The self-good feelings had a higher average score of 34.33 points; the self-respect had a higher average score of 39 points; the self-positive attitudes had a higher average score of 37.66 points; the self-capabilities had a higher average score of 34.58 points; and the self-feeling of achievement had a higher average score of 34.83 points. These results showed that using the SGs for NFEM to strengthen the dropouts' SE was effective because all of the TDs had increased SE in all dimensions.



#### 5.2.2 Results from the behavioral observation.

The results from behavioral observation from the TDs in the activities in the five learning plans in terms of general behaviors and the SE behaviors in five dimensions including self-good feelings, self-respect, self-positive attitudes, self-capabilities, and self-feeling of achievement showed that the dropouts' SE was at the very-good criterion. Thus, 8–12 dropouts or 66.70–100 percentage (%) were determined in playing the SGs, self-dependent, and able to help guide others. Therefore, it can be concluded that using the SGs as the LM for NFEM to strengthen the SE among the TDs is successfully effective.

#### 5.2.3 Results from the diary record.

The results of the analyses of the reflection and opinions of the TDs after participating in all five lesson plans reflected that the use of smartphones as a means of promoting SE can raise awareness of the SE in all five areas: self-good feelings, self-respect, self-positive attitudes, self-capabilities, and self-feeling of achievement. The results of the assessment of the SE from the diary record showed that all TDs had increased awareness of the SE; thus, total of 12 the TDs could reflect the sense of the SE correctly and creatively.

## 6. DISCUSSIONS

The study results were discussed in accordance with the objectives as follows:

### 6.1 Construction of the SGs as the LM for the NFEM to Strengthen the SE of the TDs

Smartphones are widely popular among teenagers because they are both portable communication devices on which their owners can play games. Most teenagers like to play games on their smartphones because their smartphones can be carried anywhere and they can learn and be entertained by themselves anytime. It is therefore appropriate to create a smartphone game as a learning tool that meets the need of teenagers and this corresponds to Chumwuttisak and Silanoi [15]. It is said that SGs are quality educational media that make teaching and learning interesting and enable the young learners' learning according to objectives as well. These SGs are also very helpful in building pride and meeting the needs of teenagers because they make them feel as if they lived in the world of recognition and these reasons are also in line with the concept of Piaget [12] concluding that being recognized is a psychological need for adolescents. Smartphone game playing makes young people happy and feeling accepted in simulations or in the fantasy world [16]. The corresponding author therefore had created learning materials in the form of SGs for the TDs to learn from the simulations for real-life applications. Creation of offline SGs can meet the needs of teenagers because the SGs make them more concentrate, have more courage to make their own decisions and have privacy of theirs. The highlight of the SGs is that the game players can learn anytime and anywhere; thus they gain knowledge from lessons while playing games and the smartphone game is a learning resource that is not limited to the classroom.

In order to design the SGs, the corresponding author used the Malone's Theory of Game-based Learning [13]. Such elements as amusement, competition, challenge, and imagination were inserted in them to make the learning materials for NFEM based on these games to strengthen the SE of TDs. The construction of the SGs as the LM was based on the Rosenberg's Theory of SE [8] which was composed of five dimensions including 1) self-good feelings, 2) self-respect, 3) self-positive attitudes, 4) self-capabilities, and 5) self-feeling of achievement. Meanwhile, the Knowles' Theory of Andragogy [11] was applied in developing the learning plans

and because adolescents were early adult; therefore, teachers are responsible for organizing conditions conducive to learning, exchanging knowledge between teachers and students, accepting individual differences, and being persons who guide, educate and facilitate learning.

In this study, the integration of the interview results from experts, the summarized concepts based on the Knowles' Theory of Andragogy [11] together with the Piaget's Developmental Psychology of Adolescents [12], the Rosenberg's Theory of SE [8], and the Malone's Theory of Game-based Learning [13] to construct the offline SGs on the Android operating system to enhance the teenage dropouts' SE was successfully effective because the dropouts in Kitchakute district, in Chantaburi province had already used the smartphones in the Android operating system; moreover, the offline SGs satisfied them because most of them preferred privacy. In addition, this was in line with the study on developing the set of activities to strengthen the SE by lampracha and Premchuen [17] in which useful recommendations by experts and related theories had been taken to develop counseling activities to promote the SE among students and these activities were successfully appropriate for the students because after the experiment, the students had significantly ( $p<.01$ ) higher Self-esteem. These results also confirmed that the development of the activities to strengthen the SE which was based on the recommendations by experts and related theories was effective in the students' SE promotion.

Therefore, the construction of the LM of the SGs to strengthen the SE of the TDs is so based on the data of quality, according to the teenage dropouts' contexts and reliable that these LM can be used effectively to strengthen the increased SE among teenagers.

## **6.2 Results from the Use of SGs as Media for NFEM to Strengthen the SE of TDs**

These results showed that after the experiment, all experimental participants had higher SE in all dimensions; particularly, "the self-respect was the highest ( $\bar{X}$  before the experiment=28.25 and  $\bar{X}$  after the experiment=67.25; so the highest increases = 39.00). This may be because the TDs were interested in practicing and learning to have the SE in the dimension of self-respect most because they preferred to attract attention from others. This was according to Piaget [12] who argued that teenagers generally needed the acceptance of others and the self-respect to make themselves be confident to live in society.

The increased averages of all five dimensions of these confirmed that the SGs were effective for NFEM for the dropouts and were constructed in line with the dropouts' preference. Moreover, this was consistent with the study by Chumwuttisak and Silanoi [15] on using a game-based teaching model in developing proper attitudes towards democratic citizenship revealing that after the experiment, the participants had an average of the attitudes towards the democratic citizenship 84.54 % higher than that before. This result supports that using the SG as a learning medium is effective to enable the students to learn according to the objective. It can be considered as a method that is suitable for the target group, arousing their interest, modern and responding to their needs as well.

Results from the behavioral observation revealed that the experimental group had fun and were beamingly cheerful and they could confidently accept their own successes or failures. In addition, these results are in accord with the theory by Coopersmith [18] suggesting that those with high SE will have bright and cheerful faces and expressions and are also in line with the Rosenberg's Theory of Self-Esteem [8] suggesting that teenagers can confidently accept their own successes or failures and are independent and assertive.

The results from the forms of the diary record that all TDs had increased awareness of the Self-esteem; thus, total of 12 the TDs or 100 % could reflect the sense of SE correctly and creatively. These

results show that the LM constructed in this research can strengthen the teenage dropouts' SE successfully in all five dimensions including self-good feelings, self-respect, self-positive attitudes, self-capabilities, and self-feeling of achievement according to the Rosenberg's Theory of Self-esteem [8].

In conclusion, the use of smartphone games for non-formal education management to strengthen the self-esteem of teenage dropouts can be so successful because the smartphone games can meet their needs, arouse their interests and can be learned at anytime and anywhere that the teenage dropouts can be the ones ready to learn and improve themselves, have higher self-esteem, get back to schools, pursue careers in good faith, and have the quality human resources and beneficial to the development of the country in the future.

## 7. RECOMMENDATIONS

### 7.1 Recommendations from the result

7.1.1 Teachers and agencies in the NFEM may apply the SGs resulting from this study to strengthen the SE among learners provided that the contents of the SGs and learning plans should be modified according to the learners.

7.1.2 Since the SGs developed in this study are offline and make the students unable to communicate immediately; therefore, teachers and NFEM agencies should consider making the other type of the SGs in online system so that learners can instantly communicate with others through the games.

7.1.3 Teachers and agencies in the NFEM may apply this study results to further construct the SGs to teach knowledge, skills or attributes in other areas.

### 7.2 Recommendations for further study

7.2.1 The use of the SGs to create such personal properties as achievement-oriented motivation and positive thinking etc; should be further researched.

7.1.2 The construction of the SGs in IOS to strengthen the SE or the construction of the online SGs for more access to play etc; should also be further investigated.

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