

A Behavioral Modification Program for the Development of Critical Thinking on Heterosexual Relationships Among Early Adolescents

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Abstract

This mixed methods research aimed to study the critical thinking on Heterosexual Relationship of young adolescents in order to develop a behavioral modification program of critical thinking on heterosexual relationship among early adolescents and to examine the effects of the behavioral modification program of critical thinking on heterosexual relationships among early adolescents. This study was divided into two phases. The first phase had thirteen people involved and the second phase had forty participants who were qualified to join the study. The results of the study were as follow: the results of the definition of critical thinking on heterosexual relationships behavior was reflective thinking on a good future before engaging in heterosexual activities. Furthermore, this findings showed that there were four factors of critical thinking on heterosexual relationships separated into two internal conditions: attitude toward heterosexual relationship, and self-control; two external conditions: parents providing reason for education, and learning from role models. The results of the behavioral modification program in the second phase was that after participating in the program, the students who participated in the program had higher level of critical thinking on heterosexual relationship behavior than students who did not participated in the program significantly at .05 level of confidence. The program might be useful for developing the critical thinking on heterosexual relationships. However, the author also suggested that the results of the behavioral modification program in this study is based on the skills in Thai reading and writing. Thus, skills in Thai reading and writing of the participants should be taken to considerations.

Keywords: Behavioral modification program, Early adolescents, Critical heterosexual relationship

Introduction

Regarding the issue of adolescent sexual behaviors, a survey of 1,600 students in high schools and vocational schools in Thailand discovered that adolescents' attitudes towards premarital sex were permissive, particularly among male adolescents. This population was also found to having no sense of responsibility.

Currently, the onset age of male adolescent sexual behaviors is at about 14.5 years which is during the early adolescence (Prohmmo, 2007). Besides this, although both male and female adolescents were aware of contraception methods, their usage was likely to decrease. Male population contraceptive usage was

reduced from 88.2% in 2012 to 82% in 2015 (Bureau of epidemiology department of disease control, 2008). while female population usage was reduced from 80% in 2012 to 74.6 in 2015. Adolescents deal with emerging issues ineffectively due to their lack of analytical thinking and problem-solving skills. Moreover, Thai society has changed from a society predominated by kinship to being a more individualized society in which children and youths have been neglected and are eventually easily influenced by factors outside of the family. Critical thinking skills are based on logical thinking which enables adolescents to regulate their behaviors and reflect on available alternatives for heterosexual relationships, as a result of the skilled process (The Garuna Foundation, N.D.; The office of national education commission, 2002; The committee of national committees for child and youth development promotion, 2011). A review of previous studies related to critical thinking on heterosexual relationship behaviors in children and youth in Thailand showed that there was experimental research of which, interventions to prevent risk behaviors and the promotion of critical thinking skills were investigated independently. Findings from the study on the prevention of risk behaviors showed that prevention intervention contributed to the reduction of anxiety over heterosexual relationships (Promsurin, 1998), while findings from the study on the promotion of critical thinking skills showed that intervention contributed to the quality improvement of students' thinking and problem-solving skills (Franks, 2010). However, there is a lack of integration between these two subjects. Moreover, in order to develop learning activities that promote self - awareness in the students, who subsequently applying it to their daily lives, school policy must support this approach, along with the cooperation of teachers. According to the afore mentioned circumstances, it is essential to promote adolescents' constructive beliefs and attitudes towards heterosexual relationships to avoid future risky situations in their lives. Therefore, critical thinking is proposed to

be taught. It is an important thinking skill used in learning to achieve substantial benefit. Also, it can be used to fill daily life with happiness and creativity (The office of national education commission, 2002). However, as previously mentioned, the development of adolescents' behaviors, psychological components, mental abilities and emotions is insufficient. Accordingly, study of a behavior modification program concerning critical thinking on heterosexual relationship behaviors in adolescents was needed. Results obtained in phase 1 of the study were applied to development of the behavior modification program, which would subsequently be used in phase 2. The program includes the following procedures: the modification of attitude towards critical thinking on heterosexual relationships of students in an experimental group, the promotion of positive communication between these students and their parents, and the promotion of self-regulation for these students. The behavior modification program to influence changes in critical thinking on heterosexual relationship behaviors was built on a cognitive behavior modification approach. Additionally, Bandura (1986)'s social cognitive theory was applied as the technique for cognitive modification. The obtained results will add to the body of knowledge relating to critical thinking on heterosexual relationships, as well as benefit promotion of the behaviors.

Objectives

1. To investigate the meaning and condition of critical thinking on heterosexual relationships as perceived by early adolescents.
2. To investigate the effectiveness of a behavior modification program in influencing critical heterosexual relationship behaviors in early adolescents.

Methods

Phase 1 - a qualitative case study was conducted at a secondary school under the provincial

administrative organization located in the northeastern region. The study period was from June to September 2017. Phase 2 – a quantitative study, of quasi-experimental nonrandomized controlled group pretest-posttest design, was conducted between July and September 2018.

Volunteer Inclusion Criteria Was As Follows:

Phase 1: the key informants were classified into three groups: 1) five secondary school students in grades 7 to 9 (Matthayom 1 to 3), both males and females were included, aged between 12 and 15 with characteristics such as persistence, having leadership, and being responsible. 2) five parents of the students in group 1, aged between 34 and 48. 3) three experts, aged between 45 and 72, with experience in children and youth work for more than 20 years.

Phase 2: The participants were students in grade 7 (Matthayom 1), aged between 12 and 13, who studied at a secondary school under the provincial administrative organization located in the northeastern region in semester 2 of the academic year 2017.

Inclusion criteria: students who were willing to participate in the study and had parental consent, had no pre-existing medical conditions that may impede the process of this study, and were able to read and write in Thai. The students' literacy was assessed individually by teacher, head of student affairs and head academic teacher. It was found that the students in class 1 and class 2 had higher reading and writing abilities than the students in class 3. Thus, the students in class 1 and class 2 were selected: class 1 was assigned as the experimental group (N = 22) and class 2 was assigned as the control group (N = 18). The total number of study participants was 40.

Research hypothesis in Phase 2

Critical heterosexual relationship behavior of the experimental group in posttest period was higher than the control group

Procedure

Phase 1

A) Construction of the in-depth interview tools : the concept of adolescent developmental psychology and critical thinking on heterosexual relationships behavior knowledge were applied as the interview question guideline. They were assessed by three experts in behavioral science. The research objectives, the concept, and the main issues were validated and subsequently revised accordingly to increase the appropriateness. The interview question guideline was tried out with three families in grade 7 to 9 (Matthayom 1– 3) who had similar characteristics to the participants in this study. The tool was revised based on the respondents' comments.

B) Data collection: in-depth interview and behavioral observation of key informants in the three groups were conducted.

Phase 2

Construction of the experimental tools:

A) The theoretical concepts of the cognitive behavior modification, social cognitive theory, related research, and research results from Phase 1 (The conditions of critical thinking on heterosexual relationship behavior as follows : Attitude toward critical heterosexual relationship behavior, self-regulation, parents provided reasons through positive communication, and being surrounded with role models) integrated into this program

B) The information obtained from Phase 1 was then used to develop a tool for experiment and the measurement of the dependent variables in Phase 2. The tool for the experiment was a behavior modification program to influence critical thinking on heterosexual relationship behaviors in early adolescents. The researcher developed this tool on under the basis the cognitive behavior modification approach. Meanwhile, social cognitive theory proposed by Bandura (1986) was also applied as the technique for cognitive modification. The experimental tool incorporated three activities designed to influence critical thinking on heterosexual relationship behaviors.

a. Activity 1, the modification of attitude towards

critical thinking on heterosexual relationships involved the following tasks: the presentation of the models via eight scripts about critical thinking on heterosexual relationships, role playing, observing the models demonstrated by other classmates, the summary of key points obtained from model observation, and the review of major behaviors of performed critical thinking on heterosexual relationship behaviors before the next performance.

b. Activity 2, the promotion of positive communication involved the following tasks: the presentation of a short film portraying positive communication between parents and their adolescent children, persuasive speech, experiential learning in which the parents and adolescents cooperate in writing the dialogue related to shown simulations, role-playing using the written dialogue, the

provision of feedback from observers, and the summary of key points about positive communication.

c. Activity 3, the promotion of self-regulation involved the following tasks: the identification of target behaviors, self-observation and self-recording in which self-evaluation was used to validate the recording and self-reinforcement. Content validity of these three activities were assessed by three experts in behavioral science. The language and tasks included in the three activities were validated and subsequently revised accordingly to increase the appropriateness. The activities were then tried out with eight students in grade 7 (Matthayom 1) who had similar characteristics to the participants in this study. The tool was revised based on the respondents' comments. The activities are presented in Table 1.

Table 1: Activities and objectives, based on cognitive behavior modification approach/ social cognitive theory

Session	Duration	Activity	Activity's Objectives	Materials	Techniques
1-4	200 minutes (50 minutes /session)	The modification of attitude towards critical thinking on heterosexual relationships	To modify thoughts and beliefs about critical thinking on heterosexual relationships	8 Scripts - observe friends and see through them (1) - see through friends (1) - after-school activities (2) - interesting things (2) - advantages and disadvantages acknowledgement (3) - a fresh start... the dream goal is not far away (3) - point out what is important (4) - being cautious (4)	observational learning through role playing and positive reinforcement
5	150 minutes	The promotion of positive communication	To modify the conversation between parents and adolescents concerning heterosexual relationship issues, to be more sensible	- short film - dialogues from learning simulations	observational learning through viewing short films and role playing applying the written dialogues
6-10	495 minutes (99 minutes/ session)	The promotion of self-regulation	To practice self-regulation involving critical thinking on heterosexual relationships	- self-observation and self-recording form	self-regulation

Research Tools

Phase 1

1. semi-structured open-ended questionnaire, in-depth interview guidelines with a recording of key informants' verbal responses.

2. participatory observation

Phase 2

the measurement tool used was critical thinking on heterosexual relationship behaviors measurement. Content validity was validated by three experts in behavioral science and measurement. The congruence between items, definitions, and four components of critical thinking on heterosexual relationships, including 1) ability to observe the opposite gender to identify positive and negative behaviors before making a decision in doing activities together; 2) ability to treat the opposite gender in a manner appropriate to one's age based on Thai culture; 3) ability to set goals that benefit one's future; and 4) ability to identify key issues to anticipate consequences of the situation involving the opposite gender. Language and the short film included in the measurement were validated; subsequently, the appropriateness of the language and screenplays used for the short film were improved. Also, the items were revised according to recommendations to make it more comprehensible.

The tool was then trialed with 30 students in grade 7 who had similar characteristics to the participants in this study participants at a secondary school under the provincial administrative organization located in the northeastern region. The item discrimination indices ranged between .07 and .50. For tool reliability, the overall Cronbach alpha coefficient was .59. Items with discrimination indices of .37 and over, were revised to gain more clarity, as recommended by the behavioral science experts. Finally, the total number of items was reduced from five to four, together with a short film portraying four situations.

The measurement of critical thinking on heterosexual relationship behaviors was done by telling the participants to respond to short

film showing four situations about heterosexual relationship behaviors observed. The situations were designed to stimulate critical thinking of the participants by having them write four reasons for each situation (i.e. being invited over to watch a movie alone with an opposite-gender friend). Scoring rubrics with five levels of quality, from 0 "a student is incapable to explain critical thinking on heterosexual relationship behaviors" to 4 "a student can explain critical thinking on heterosexual relationship behaviors very well" were used for the assessment.

Data Analysis

Phase 1

An interpretation was conducted through linking the theoretical framework with the recorded information in each stage and a comparison was subsequently made to acquire the information which was free from the researcher's prejudice. For this study, the researcher abided by the principles for conducting research involving human participants. Before data collection, the participants were informed of their rights, as well as the objectives of the study, by the researcher; the consent forms were then signed. For participants aged under 18, parental consent forms were obtained. The researcher also emphasized precautions taken to protect the confidentiality of the participants' personal information and those people involved with them.

Phase 2

The statistics used was Analysis Of Covariance (ANCOVA). The pretest scores of the experimental and control groups were included as the covariate variable; one-tailed test controlling for the covariate variable was conducted.

Results

Phase 1

The key informants consisted of three students in grade 9 (Matthayom 3), one student in grade 8 (Matthayom 2), and one student in grade 7 (Matthayom 1), including males and females. Regarding birth order, some were only children while others had siblings. With reference to

heterosexual relationships, these students made friends with the opposite gender in order to ask about homework and do school activities together. This information was in line with what the parents taught the students about heterosexual relationships (i.e. to be friends and do school activities together). Moreover, the information obtained from the students regarding responsibilities at home was consistent with the parents – all parents assigned responsibilities to the students since they were in primary school and taught them about goal setting. As regards to parents' general information, the parents had varied educational levels: two parents completed grade 6 (Prathom 6), one parent completed grade 12 (Matthayom 6), one parent completed grade 9 (Matthayom 3), and one parent had no formal education.

The parents group included a father, a mother, and an aunt. Their occupations were varied: two of them were factory employees, one was owner of a cooked-to-order restaurant, one was unskilled laborer, and one was contractor. Considering the characteristics of the students and the parents, these participants met the inclusion criteria: the parents of students in grade 7 – 9 (Matthayom 1-3) with the characteristics of persistence, having leadership and being responsible. There were three experts including both male and female. They had an educational qualification higher than a bachelor degree, received training in their specialty area, and had more than 20 years of experience in children and youth work.

Results of this study can be summarized as follows:

Part 1. meaning of critical thinking on heterosexual relationships as perceived by early adolescents

Critical thinking on heterosexual relationships referred to doing activities together with the opposite gender person outside the classroom with the awareness of the consequences that would not negatively affect one's future. The activities included getting together to do homework or group work, playing games, use Facebook, play sport in

free time, and hang out after class and during weekends. The meaning derived from the perspectives entailed various dimensions among the students; the parents; and the experts, which were categorized into two dimensions:

1) The cognitive dimension which was divided into reflective thinking and logical thinking. As regards reflective thinking, the key informants described it as consideration, prior to taking an action. Reflection on situations or activities initiated by the opposite gender was done before responding. This type of thinking also involved consideration of good behavior norms – thinking about proper behaviors for their age, based on Thai culture and parents' words. As for logical thinking, it was described as being keen on observing the opposite gender's behaviors and able to differentiate between positive and negative behaviors, as well as between friendship and a romantic relationship.

2) The activity dimension included school activities and outside of school activities. School activities involved studying; playing sport; and doing recreational activities during lunch break or other breaks. Outside of school activities involved chatting or consulting with opposite gender friends online; consulting with parents; hanging out with friends or families; playing sport in the neighborhood; studying the dhamma at a temple near home; and planning time for group work and household chores. Results regarding the meaning discovered are presented in figure 1.

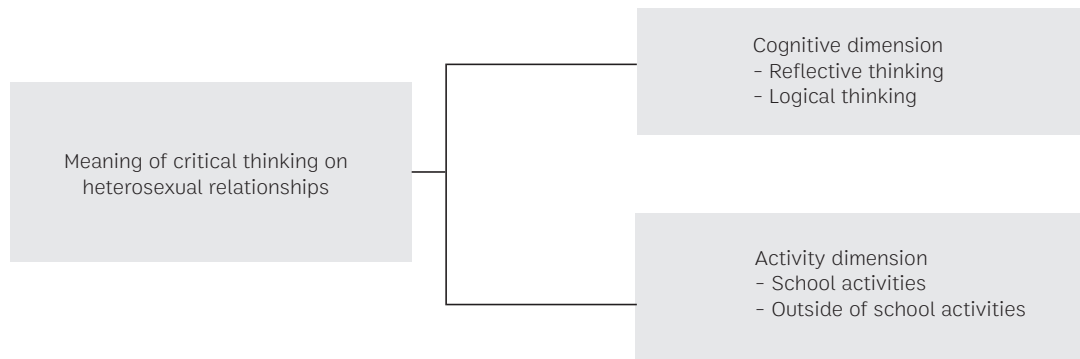


Figure 1 : Summary of the meaning of a critical heterosexual relationship as perceived by early adolescents

Part 2. conditions of a critical thinking on heterosexual relationship in early adolescents

As perceived by the experts, as well as by the students and their parents at a secondary school under the provincial administrative organization located in the northeastern region, there were internal and external conditions, comprised of four factors related to critical thinking on heterosexual relationships as described below:

1. Internal conditions resulted from beliefs, emotions, thoughts, and psychological characteristics of an individual, which influenced critical thinking on heterosexual relationships. Two factors incorporated in this condition were found: : 1.1) Attitude towards critical thinking on heterosexual relationships referred to the condition in which adolescents were aware of the advantages and disadvantages of heterosexual relationships, were able to express their feelings about opposite gender friends, and were decisive in behaving appropriately for their age when engaging with opposite gender friends. 1.2) Self-control referred to the condition in which adolescents were able to regulate themselves from within through being determined, self-respecting, persistent, disciplined, and aware of their obligations to themselves and others.

2. External/social conditions were factors

that did not directly originate from within, but had an impact on critical thinking on heterosexual relationships in early adolescents. Two factors incorporated in this condition were found: 2.1) parenting that applied reasoning to guide children, referred to the condition in which parents provided reasons through positive communication, in order to guide the students about what was, or was not, appropriate behaviour when engaging with opposite gender friends. To cultivate positive behaviors, the parents supported beneficial behaviors, as well as taught the students how to anticipate the consequences of their actions – not to trouble themselves and others. 2.2) Being surrounded with role models referred to the condition in which the parents behaved in a way that set examples for the students and pointed out the consequences of engaging in heterosexual relationships among people around them. Additionally, the parents provided opportunities for students to gain experiential learning from school, teachers, friends, and new social environments in which the students could learn appropriate behaviors related to critical heterosexual relationships.

The summary of the two conditions are presented in figure 2

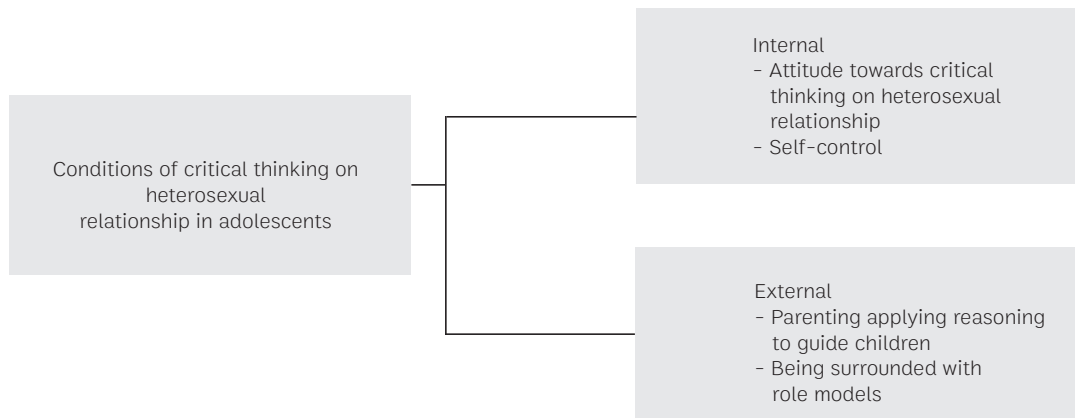


Figure 2 : The summary of conditions of critical heterosexual relationships in early adolescents

Phase 2

The experiment resulted in a score for critical thinking on heterosexual relationship behaviors of the experimental group which was higher than the control group. When setting the equivalent baseline scores for the experimental and control groups (Mean of critical thinking on heterosexual

relationship behaviors = 0.213), it was found that students engaged in the behavior modification program to influence critical thinking on heterosexual relationship behaviors, had higher scores than those who were not (The adjusted mean of the experimental group = 3.32, the control group = 1.83) as shown in Table 2

Table 2 : Descriptive statistics of critical heterosexual relationship behaviors of students being/not being engaged in the behavior modification program

Source of Variable	Pretest		Posttest	
	$\bar{x}'$	SD	$\bar{x}'$	SD
Experimental Group (N = 22)	1.23	.97	3.32	1.76
Control Group (N = 18)	1.17	.79	1.83	1.62
Total	1.20	.88	2.65	1.83

Ancova was conducted to determine a statistical difference between being engaged in the behavior modification program and not being engaged in the program for critical thinking on heterosexual relationship behaviors, controlling for the pretest score of critical thinking on

heterosexual relationship behaviors. Results showed that the students engaged in the program had a higher score of critical thinking on heterosexual relationship behaviors than those not engaged in the program, at the statistically significant level of .05 ($\bar{x}'$ ad The

experimental group = 3.31, x' ad The control group = 1.84) with moderate effect size. It indicates that the difference found resulted from the effect of the behavior modification program to influence

critical thinking on heterosexual relationship behaviors, which accepts the above hypothesis. The results are presented in Table 3

Table 3 : ANCOVA results for critical heterosexual relationship behaviors of the experimental and control groups controlling for the pretest score (Covariate)

Source Of Variation	Ss	Df	Ms	F	P	Es
Covariate	1.15	1	1.15	.39	.53	.54
Experimental Group	21.46	1	21.46	7.34	.01**	
Error	108.12	37	2.92			

Discussion

Phase 1

Results reveal that the meaning of critical heterosexual relationships, as perceived by the three informant groups, is consistent with the definition from various concepts. It incorporates doing activities with an opposite gender friend that one finds interesting, wants to talk to, wants to go out with, and feels sexually aroused by. Also, it involves thorough consideration prior to making a decision on doing activities together (Watson & Glaser, 1964; Ennis, 1985; Dewey, 1993; Hunter, 2014). Considering the emic view of the meaning of a critical thinking on heterosexual relationship, it is in line with theory of stages of cognitive development proposed by Piaget (2015). The theory discovered that, from age 12 to adulthood, there is a formal operational stage, where humans can think logically and in an abstract manner. If adolescents are trained to use deductive reasoning, their thinking skills will be well-developed. That is because systematic thinking and the ability to solve a problem in a complicated situation can be developed if one has been trained (Morris & Sloutsky, 1998, cited in Steinberg, 2017). The internal condition of critical thinking on heterosexual relationships

in early adolescents includes the attitude towards critical heterosexual relationships and self-control. It is the viewpoints that adolescents acquire through social experience. Bandura's concept (Bandura, 1986) states the process in which an individual controls internal factors, such as thoughts, emotions, and beliefs to regulate their responses to external influencers – to pursue determined goals. The individual will weigh up goals with achieving their purposes and changing their behaviors. That is in line with Matric (2018)'s study about self-control via self-regulation and the learning process. Nine male and female students, aged 14 were interviewed; results showed that self-regulation training was important. The method enabled an individual to achieve the goal derived from their own interests and social expectations. To successfully reach the goal, an individual must experience the joy of success. Moreover, self-regulation contributes to the maintenance of desirable behaviors and inhibits undesirable behaviors.

Also, there are external conditions which include parents applying reasoning with their children, and being surrounded by good role models. It is the viewpoints of adolescents

who own their experiences which are influenced from outer environments. For example, families, teachers and friends encourage critical heterosexual relationship behaviors in adolescents. Bandura (1986) explains that behavioral modelling is the process in which an act of the model influences the establishment of a new behavior in an individual. That is consistent with the study by Torsricharoen et al., (2006) that investigated biosocial factors influencing attitude towards heterosexual relationships among secondary school students in the Bangkok region. It was found that student-parent relationships predicted the secondary school students' attitudes towards heterosexual relationships at the statistically significant level of .05.

Phase 2

Referring to the hypothesis, "Critical heterosexual behaviors of the experimental group after engaging in the experiment, was higher than the control group", it was found that students in the experimental group, who were engaged in the behavioral modification program, had higher critical heterosexual relationship behaviors than those in the control group, who were not engaged in the program, at the statistically significant level of .05. This result supports the hypothesis. That is because the students who engaged in the behavioral modification program had changed their cognitive process, resulting from the approach applied by the researcher. The cognitive behavior modification approach being applied here, aimed to alter outer behaviors through observational learning and self-regulation techniques, based on Bandura's social cognitive theory. The first step of the behavioral modification program was the process of changing the attitude towards critical heterosexual relationships – the key internal factor affecting critical heterosexual relationship behavior which was discovered in phase 1. The students in the experimental group were exposed to the models' critical heterosexual relationship behaviors and then willing to imitate them. The scenario in which the

model performed critical heterosexual behaviors and then received positive reinforcement, functioned as the motivation for triggering the students' desire to imitate the target behaviors to receive positive reinforcement likewise (Vicarious Reinforcement). The students who undertook the vicarious reinforcement process i.e. who observed the model performing critical heterosexual relationship behaviors and, as a consequence, received positive reinforcement, such as praise from teachers or parents, were likely to have positive feelings about critical heterosexual relationship behaviors. Subsequently, the students changed their attitude in the dimension of positive feelings about critical heterosexual relationship behaviors. This process was repeated eight times. Thus, the attitude of the experimental group increased. After being engaged in the behavior modification program, the experimental group had a mean score of attitude towards critical heterosexual relationship of 95.00 which was higher than the baseline score (Mean = 89.91). This is consistent with the study conducted by Noor, Sreenivasan, & Ismail (2013) to investigate the attitude of Malaysian customers towards mobile advertising with 856 participants. This study found a significant relationship between attitude towards mobile advertising and subjective norms, perceived behavioral control, and intention to purchase products and services.

In addition, the researcher applied the observational learning technique to modify outer behaviors – the positive communication between the students and their parents according to the information obtained from the study in phase 1. The researcher presented the models in a short film portraying a story about positive communication between parents and adolescent children concerning dressing modestly to protect themselves from opposite gender friends. The parents and the students watched the short film together and then wrote dialogues for three simulated situations together (e.g. a male friend invites the parent's daughter to visit his place etc.). Afterwards, they did role plays using the written dialogues; with an emphasis on the

performing of positive communication as seen from the models. The mechanism, with which the parents and students observed the models and role played, served as the antecedent that triggered the cognitive process. It was the acquisition of new information which resulted in learned positive communication knowledge. The researcher evaluated the development of positive communication by conducting focus group discussion concerning the application of the learned knowledge, with the parents engaging in the behavior modification program. Positive change in communication was found, with parents improving communication with their adolescent children, as described below.

**“I [a mom] will listen more, ask about reasons, and ask for your opinion more often.”
(Interviewed on September 9, 2018)**

Another internal factor obtained from the study in phase 1 was self-regulation. The researcher used the control over internal influences approach – gradually diminishing the influence of external factors by applying Bandura’s self-regulation technique. The researcher assigned the students in the experimental group to practice self-regulation through setting their own goals, practicing self-observation and self-recording, and making a decision concerning self-evaluation in comparison with others. Moreover, the students were required to plan for self-reinforcement/punishment when achieving/not achieving their goals using a reinforcer survey form. This procedure enabled the students to regulate themselves, which is consistent with the study conducted by Srikan (2009): an investigation on the effect of a self-regulation program on academic responsibilities of students in grade 5 (Prathom 6) at Phonprachanukul Municipality School, Phon District, Khon Kaen Province. Results revealed that the students who engaged in the self-regulation program had higher academic responsibilities, both overall and in each dimension, at a statistically significant level of .01. Practicing cognitive modification through direct and indirect experience simultaneously

(i.e. being engaged in three activities included in the behavioral modification program to influence critical heterosexual relationship behaviors in early adolescents) contributed to an increase in critical heterosexual relationship behaviors. The mean score of critical heterosexual relationship behaviors had increased, from the baseline score of 0.21, to be 3.32 at posttest.

Recommendations

1. There is a limitation of the activities conducted in this study. The activities included in the current study required the participants to be able to read and write in the Thai language. Therefore, it is recommended that easier activities should be used in the practice of thought communication in the study with adolescent students in grade 7 (Matthayom 1).
2. The results revealed that after the experiment, critical heterosexual relationship behaviors of the experimental group had increased from baseline. Therefore, a longitudinal study should be conducted to further investigate the extent to which the students continue to perform critical heterosexual behaviors.
3. This study involves the application of the behavior modification program with male and female student subjects in the same school. Therefore, future study should investigate the effect of this program with students in a single-gender school to validate the program’s effectiveness.

Ethics Approval

This study was approved by the institutional review board of strategic wisdom and research institute, Srinakharinwirot University (Swuec/E-257/2560).

References

- Bandura, A. (1986). *Social Foundations Of Thought And Action : A Social Cognitive Theory*. Englewood Cliffs, New Jersey : Prentice-Hall.
- Bureau of epidemiology department of disease control. (2008). *Summary of disease surveillance in sexually transmitted diseases report*. Retrieved On Oct 1st, 2016 From www.boe.moph.go.th/Annual/Annual1.202551/Part1_51/3251_ST1.doc (In Thai).
- Dewey, J. (1910). *How we think*. Boston: DC Heath & Co. *Teaching to Teach with Purpose and Passion*.
- Ennis, R. H. (1985). A logical basis for measuring critical thinking skills. *Educational leadership*, 43(2), 44–48.
- Franks, J. S. (2010). *Critical thinking and problem solving in a rural poverty situation: An action research project* (Doctoral dissertation, Purdue University).
- Hunter, D.A. (2014). *A Practical Guide To Critical Thinking* (2nded.). Toronto: John Wiley & Sons.
- Matric, M. (2018). Self-regulatory systems: Self-regulation and learning. *Journal of Process Management. New Technologies*, 6(4), 79–84.
- Noor, M. N. M., Sreenivasan, J., & Ismail, H. (2013). Malaysian consumers attitude towards mobile advertising, the role of permission and its impact on purchase intention: a structural equation modeling approach. *Asian Social Science*, 9(5), 135.
- Phonmasurin, W. (1998). *Comparison of the results of individualized sensitivity reduction training and individual counseling a person-centered model to reduce anxiety about courtship of second - year students*. (Master's thesis). Graduate School, Srinakharinwirot University, Bangkok. (in Thai)
- Piaget, J. (2015). *Piaget's Stages of Cognitive Development*. Retrieved from <https://creativecommons.org/licenses/by-sa/4.0/>
- Prohmmo, A. (2007). *Adolescent Health And Development Situation In Thailand*. Nakhon Pathom: Institute For Population And Social Research Mahidol University. *Results Of Individualized Sensitivity Reduction Training And Individual Counseling A Person-Centered Model To Reduce Anxiety About Courtship Of Second - Year Students*. (Master's Degree). Bangkok: Srinakharinwirot University. (In Thai)
- Srikan, S. (2009). *An Investigation On The Effect Of Self-Regulation Program On Academic Responsibilities Of Students In Grade 5 Of Phonprachanukul Municipality School, Phon District, Khon Kaen Province*. (Master's Degree). Bangkok : Srinakharinwirot University. (In Thai)
- Steinberg. (2017). *Adolescence*. (11thed). New York: McGraw-Hill Education.
- The Committee Of National Committees For Child And Youth Development Promotion. (2011). *National Education Act B.E. 1999 And Editing* (2nd) 2002. Bangkok : Sweet Chili Graphic Co., Ltd. (In Thai)
- The Garuna Foundation. (N.D.). *Health Risk Behavior Of Adolescents*. Retrieved On July 28th, 2017 From <http://www.Dmh.Go.Th/Downloadportal/Strategy>. (In Thai)
- The Office Of National Education Commission. (2002). *National Child And Youth Development Plan 2012 - 2016*. Bangkok: Community Agricultural Cooperatives Of Thailand Publisher. (In Thai)
- Torsricharoen, N., Jindamat, W., Suwalirat, A., Phetsang, Y., Ingkhullanon, T., Jinphakdi, K. (2006). *Biosocial Factors Influencing Attitude Towards Heterosexual Relationship Among Secondary School Students In Bangkok Region*. Research Report Of Instruction 325 (Psychology). Bangkok: Srinakharinwirot University. (In Thai)
- Watson, G., Glaser, E.M. (1964). *Watson-Glaser Critical Thinking Appraisal Manual: Form Ym and Zm*. New York: Harcourt Brace and World Inc.