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An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills

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Abstract
The aim of this study was to develop an educational innovation called "An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills." The study recognized the importance of social changes (i.e., becoming a knowledge-based society and a digital society) in the 21st century by examining knowledge from good quality resources that are related to a variety of concepts of 21st-century skills development. The information, which has been widely published on the Internet, was used to develop a system and to create efficient educational innovations, which hopefully will be beneficial to the development of teachers and students in the future. Based upon the concepts of: "Successful teachers, successful students" and "Knowledge and Action are power," online programs are used as media so that the target population can access them quickly and efficiently and with lower costs and with the availability of "Anywhere and Anytime." As a result, the effective innovation of "An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills" has been developed in accordance with the criteria. Moreover, the innovation will be utilized at the Faculty of Education at the main campus of Mahamakut Buddhist University and at every other campus, which offers Thai, English, and Social Teaching curriculums.

Keywords: 21st-Century Skills, Critical Thinking Skills, Online Programs, Self-Learning Module

1. Introduction

At present, Information Technology and Communications through the system of the Internet are greatly influencing the development of innovations. Thus, the educators and educational entrepreneurs have been creating innovations to expand the learning limitations, to create opportunities to gain access to learning resources, and to create success in learning. These innovations are powerful tools that can help to facilitate the management of teaching and learning activities and instructors should learn to apply the designs of educational innovations in order to facilitate learning. Therefore, the Ministry of Education has agreed to make a policy to support the study of innovations. For example, in the national educational plans, it has stated its goals to develop learners' creative attributes and skills (Office of the Education Council, 2017). In the second issue of the 15-year plans of higher education (2008-2022), the objective was to produce graduates, who could develop innovations (Office of the Higher Education Commission, Ministry of Education, 2017). The 12th issue of the National Economic and Social Development plans focused on the reformation of learning and on developing the whole educational system so

that innovations could be produced (Office of the National Economic and Social Development Council, 2018). The Office of Higher Education Commission assigns all educational institutes to aim at developing intellectual skills and producing graduates, who have the qualifications to think critically and innovatively (Office for National Education Standards and Quality Assessment (Public Organization), 2010). Additionally, it has been said that in the Thailand 4.0 Model, the country's sustainability would become a success through innovations that would drive and develop the economy. In other words, the youth of Thailand need to develop 21st-century skills, including critical thinking skills.

To enter the era of Thailand 4.0, the country needs to create its own innovations without international help as before. The key goal of Thailand 4.0 is to become a country which is "wealthy, stable, and sustainable." In other words, the goal is to generate more income and to produce higher quality human resources because it is the most essential element. Human beings possess knowledge and energy, which can drive the country forward. In order to develop high-quality individuals with knowledge and skills in accordance with the mentioned policy, it is vital for the education system of Thailand to enter "Education 4.0" because it is an essential tool for developing and improving the quality of human resources (Meesri & Devata, 2018). In the era of Thailand 4.0, the focus is not only placed on providing information and classroom knowledge for learners, but also on preparing them to be humans, who have essential survival skills, especially morals for the 21st century, such as critical thinking, problem solving, creativity, and innovation creation (Office of the National Economic and Social Development Council, 2018).

In this first portion of the 21st century, there have been many studies about technology, including studies that have placed emphasis on the rise of the Internet as it becomes the medium of education in the modern world. In 1993, a survey of the educational value of the activities on computer networks across the United States of America was conducted by Bank Street College of Education, who found that online activities help learners to see the world from a broader perspective as they learn more about societies, communities, and cultures. The learners can search for information from any part of the world because the Internet gives them access and opportunities to communicate with people anytime and anywhere. Therefore, computer networks are resources that have enormous amounts of intellectual treasure with much more than any other source. This results in high-order thinking skills, especially inquiry-based analytical skills, critical thinking skills, data analytical skills, problem-solving skills, and freethought skills (Thai Good Views, 2009).

Thajchayapong (1998) discussed the different ways in which the Internet can benefit education. Firstly, it gives teachers and learners access to numerous learning resources, such as the "Library of the World." Information is available at the touch of a finger anytime and anywhere, even in areas where few resources are available. Together, students can input information about plants, nature, the environment, the history of communities, local arts, cultures, and wisdom, and then they exchange it with other students around the globe. At the same time, teachers can share useful information online, such as academic articles and teaching materials with other teachers, which can even help the students to learn. Secondly, it helps to develop communication between teachers and students. For example, they can send emails, which are convenient, fast, precise, and easy to use. As a result, greater communication among teachers, between teachers and students, and among students themselves can occur within the educational sphere. Thirdly, the roles of the teachers and students are changing. The use of the internet in teaching and learning shifts the focus of a classroom allowing teachers to become facilitators and allowing learning to become more active. Moreover, the internet database is an important and positive factor, which helps to enhance the students' learning and allows them to conduct research by themselves. Hence, applying technologies is vital to the development of educational quality. It is also important to adjust the roles when building learning networks both inside and outside of schools and to develop the students' knowledge and abilities, so that they can gain the necessary skills to compete in the international market and to live happily (Ministry of Education, 2008).

The 21st century's social changes are widely affecting the way of life, so the teachers need to be ready to prepare students for life in the 21st century, which differs greatly from the past century. The most essential skill is the skill of learning, which is causing the management of learning to change. Knowledge, abilities, and vital skills are the results of the reformation of teaching and learning in tandem with the preparation for other skills. Another essential skill is the skill of innovation, which is an indicator of the students' readiness to enter what is today's more

complicated world of work. These skills consist of initiative, creative and innovative skills, critical thinking and problem-solving skills, and communications and cooperative skills (Abdulloh & Niemted, 2020).

The first researcher is a teacher at the Faculty of Education at the main campus of Mahamakut Buddhist University and is a supervisor. After having discussions with students, it was brought to the researcher's attention that due to a lack of activities to develop their critical thinking skills, most of the students, as a result, did not possess these vital skills. Browne, Freeman, and Williamson (2000), McDunnigann (n.d.), Regan (2015), University of Essex (2016), and University of West Florida (2018) all agree that critical thinking skills are necessary for the following reasons: 1) they give people confidence when needing to effectively solve problems; 2) they help people to make logical and cautious decisions; and 3) they help people to achieve their goals more efficiently because they can think critically and logically. Moreover, critical thinking skills, which are based on logic and principles, contribute by: 1) enhancing communicative skills; 2) helping people, who are living in a constantly changing world to become lifelong learners; and 3) helping people to become more disciplined and responsible. The aforementioned advantages of critical thinking skills can promote more efficient performance.

The unceasing changes in society, the expectations for the further development of the country, the goal of enhancing education in accordance with the Thailand 4.0 Model, the various uses of the Internet for educational purposes, a lack of critical thinking skills among students and a lack of activities to help develop critical thinking skills for the students at the main campus of Mahamakut Buddhist University have all led the group of researchers to develop the educational innovation called "An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills." The researchers believe that the use of Research and Development (R&D) methodology corresponds to the previously mentioned backgrounds and statements of the problems for the online program that was studied and developed in the selected experimental area. Moreover, they believe that the target population can benefit from the results of this study, which is the objective of publishing this study. According to the principles of R&D methodology, once an innovation has been piloted with a target group, whose qualifications can represent a population, and once that innovation has been proven to be efficient in accordance with the set criteria, then the innovation can be more efficiently and effectively used with the referred population group in much wider areas and will less cost than the document-based programs.

2. Objectives of the Research

This study aimed at applying Research and Development (R&D) methodology, which would result in the creation of "An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills" in accordance with the criteria. The elements of this online program were the projects for the development of the teachers' learning and for the application of the results from the teachers' progress to develop the students. Each project consisted of a self-learning and practice manual created in a module pattern.

3. Research Hypothesis

After reviewing the related literature, the researcher made a manual, evaluated the quality of the manual, and revised it, and then created a tool for the pilot. The researcher piloted the manual in randomly selected schools in the experimental areas and used the principles and conceptual framework of R&D methodology, which is believed to generate efficient educational innovations. Therefore, the research hypothesis was that the development of "An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills" would be efficient and would show the following results: 1) post-test scores of the teachers would meet or exceed the 90/90 standard and there would be significantly higher average scores at post-development and 2) the average scores of the post-tests of the students' critical thinking skills evaluation would be significantly higher than the pre-tests.

4. Research Methodology

4.1 The Conceptual Framework

Creating "An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills," which would be efficient, was based on the following: 1) the importance of changes in society with respect to

knowledge and 2) the digitally-based society of the 21st century. The published resources of knowledge, related to skills development in the 21st century on the Internet, were examined for their quality, were placed into a system, and were further studied. The program could be beneficial to promoting the development of teachers and students using the concepts: "Successful teachers, Successful students." and "Knowledge and action are power." By using an online program, gaining access to the medium will be easier, more effective, quicker, and cheaper for the target population and will make it available for them anywhere and at any time. Research and Development (R&D) methodology, described by Sanrattana (2018), showed that any innovation, which is developed using R&D methodology, aims at developing "the individual" and "the work." The expectation is that when one has knowledge and is motivated to put that knowledge into action, it will create the power to work more efficiently. In addition, the concepts found in literature review are considered to be the vital origins of R&D methodology because the knowledge was used to develop the online program. Thus, the process of R&D methodology in this study originated with a review of the literature in the sequence of R1&D1... R2&D2... R3&D3... Ri&Di as follows:

R1&D1: A Review of the Literature The related literature was reviewed to discover "definitions, importance attributes or qualifications, ways of development, processes of development, and evaluation," which then led to arranging the projects in an online format, which consisted of a project to develop the set of teachers' learning manuals (6 manuals) and a second project for the teachers to apply of the results of their development to develop students, which consisted of practice manual (1 manual).

R2&D2: Use focused group discussion with the teachers at a school which is not in the experimental area which is Mahamakut Buddhist University, Lanna campus (10 teachers) to investigate any error to revise the manual.

R3&D3: Use focused group discussion with 15 teachers at a school which is not in the experimental area which is Mahamakut Buddhist University, Roi-et campus to investigate any error to revise the manual (like phase 1).

R4&D4: A Review of the Related Literature The related literature was explored to build 2 sets of research tools, which consisted of a post-learning test for the teachers and an evaluation of the students' critical thinking skills.

R5&D5: The Experimental Research This pre-experimental research was conducted with a one group pre-test/post-test design at the Faculty of Education, on the main campus of Mahamakut Buddhist University, which was randomly selected as the experimental area. The 15 full-time Thai, English, and Social teachers, who comprised the experimental group, were chosen by purposive sampling. There were 207 undergraduate students in the Thai, English, and Social teaching departments, who made up the target group. The study was conducted during the Second Semester of the Academic Year 2021. The experimental research was divided into two phases as described below:

Phase 1: The Self-development of the teacher research group The online self-learning was developed from the manual. The activities and time frame of the study were as follows: 1) the teachers in the research group were informed about the details of the study, including the pre-test (This step took two days.); 2) the teachers' skills were developed by using self-learning principles from the manual, which could be downloaded from the website created by the researcher, and steps were taken to make sure that the learning process was not influenced by the researcher and that no other individuals interfered (This step took one month.); 3) the teachers in the experimental group carried out error detection by examining the manual and making revisions and then assessed the post-tests (This step took two days.); and 4) the results of the teachers' post-test were analyzed and were compared to the standard 90/90 criteria, and then a t-test dependent was used to determine the results from comparing the pre-tests and post-tests (This step took two days.).

Phase 2: Applying the Results The teachers applied the results of their learning to further develop their students. The activities and time frames were as follows: 1) the details of the study were shared with the teachers in the research group and the critical thinking evaluation of the students' pre-test was examined (This step took two days.); 2) the teachers in the experimental group applied the results of their learning to develop the students' critical thinking skills without receiving any interference from the researcher or from others (This step took two months.);

3) the teachers in the experimental group carried out error detection by examining the manual and making revisions and then they assessed the students' post-tests (This step took two days.); and 4) the pre-test and post-test scores were analyzed and compared by using a t-test dependent (This step took two days.).

4.2 Research Tools

1. Employing the Teachers' Learning Test The test was a multiple choice test with four options, and its objective was to test the results of the teachers' learning before and after the experiment. The group of researchers developed the test from the definitions, the important aspects, attributes, the conceptual framework for development, and from evaluations. Its scope was in accordance with the cognitive domain found in Benjamin S. Bloom's The Revised Taxonomy (2001). It ranks thinking skills from low to high as follows: remembering, understanding, applying, analyzing, evaluating, and creating (Armstrong, 2010). The evaluation was created in Google form, and the following aspects were examined for quality:

1.1 To investigate the validity of the content, Rovinelli and Hambleton (1977)'s Indexes of Item-Objective Congruence (IOC) were used. Five experts in the fields of Curriculum & Instruction, and Educational Measurements & Evaluations checked the validity, and the results showed that the IOC for each of the question items had been higher than the set number of 0.50 (Chaichanawirote & Vantum, 2017).

1.2 The test was trialed with 30 teachers at schools outside of the experimental areas: Mahamakut Buddhist University, Isan and Roi-et campuses. An analysis of data indicated the following: 1) the index of difficulty for every question item had been at the standard level (0.20 - 0.80) and the power of discrimination value had been 0.20-1.00; 2) the KR-20 had shown a reliability coefficient of 0.92, which was higher than the set value in the criteria at 0.70; and 3) the index of difficulty for the whole test had been 49.81, which is considered to be appropriate.

2. Evaluating the Students' Critical Thinking Skills A 5-rating scale evaluation (i.e. highest, high, medium, low, and lowest) was used for the assessment. This evaluation was developed based on the study of attributes or qualifications of critical thinking skills from the perspectives of American Management Association (2019), Love (2019), Crockett (n.d.), Raudenbush (2017), and Todd (n.d.) and included a study of the evaluation framework of critical thinking skills by Sarigoz (2012), Tung and Chang (2009), and Khushbakht (2021). The evaluation was created in Google Form and examined the following:

2.1 Its content validity was tested by Rovinelli and Hambleton's method, which consisted of evaluation by 5 experts in the fields of Educational Administration, and Educational Measurements & Evaluations. The results of the data analysis showed that every question item had scored in IOC of more than the 0.50, which was set in the criteria. This meant that the questions in the adaptability skills evaluation could be adapted to assess anything related to the set objectives (Chaichanawirote & Vantum, 2017).

2.2 The evaluation was conducted with 30 students at the Isan campus of Mahamakut Buddhist University (a non-experimental area) to analyze the alpha coefficient of reliability following Cronbach's method. The analysis indicated that the alpha coefficient of reliability of the evaluation had been 0.97. After analyzing each part, the following data was found: 1) the problem-solving skills had been 0.89, 2) the learning for critical thinking skills development had been 0.87, 3) the critical thinking skills for making decisions had been 0.93, and 4) the behavioral indicators of having critical thinking skills had been 0.93. This alpha coefficient of reliability mentioned earlier was higher than the set number in the criteria, which was 0.70. This value confirmed the quality of the evaluation and that it could be used effectively (UCLA: Statistical Consulting Group, 2016).

4.3 Data Analysis

1. After the experiment, the results of the teachers' learning were compared with the 90/90 standard. The first 90 refers to a percentage of the average score for the whole group of teachers, whereas the second 90 refers to the percentage of the teachers, who had been able to pass every objective of the test (Yamkasikorn, 2008).
2. The results of the comparison of the teachers' learning pre-test and post-test and the students' critical thinking skills evaluation before and after the experiment were analyzed using a t–test dependent.

5. Research Results

From the procedures of R1&D1, "An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills" was developed and included 2 projects. The manuals for each project are described below:

1. The Teachers' learning development project consisted of 6 sets of self-learning manuals, and each copy discusses the viewpoints of educational experts and institutes from the review of literature:

1.1 The definitions of critical thinking skills were obtained from Doyle (2019), Erstad (2018), Halpern (1998), Indeed Editorial Team (2019), Lau (n.d.), Michigan engineering (n.d.), Patterson (2017), Skills You Need (n.d.), and Tomaszewski (2019).

1.2 The importance of critical thinking skills was obtained from Browne, Freeman, and Williamson (2000), McDunnigann (n.d.), Regan (2015), University of Essex (2016), and University of West Florida (2018).

1.3 The attributes or qualifications of the indicators of critical thinking skills were obtained from American Management Association (2019), Love (2019), Crockett (n.d.), Raudenbush (2017), and Todd (n.d.).

1.4 The ways for the development of critical thinking skills were obtained from Alexander (2018), Bright Horizons Education Team (2021), College Success (n.d.), Hemphill (2018), Hurst (n.d.), NUI Galway (n.d.), Scott (2019), Struyk (2012), and Tan (2017).

1.5 The step model for developing critical thinking skills was obtained from Elmansy (2016), Milam (n.d.), Patterson (2020), Reasoninglab (n.d.), and Struyk (2012).

1.6 The evaluation of critical thinking skills was obtained from Sarigoz (2012), Tung and Chang (2009), and Khushbakht (2021).

2. The Project for the teachers to apply their learning to develop students consisted of a practice manual with instructions and a summary of the following important aspects: 1) the attributes or qualifications of critical thinking skills, which are expected from the students; 2) the framework for the development of critical thinking skills; and 3) the methods for the development of critical thinking skills. At the end of the manual, there was a self-evaluation for the teachers to assess how they had applied what they learned, to share their opinions on both the advantages and disadvantages of the manual, and to reflect upon the work.

From the procedures of R2&D2 to R5&D5, the following were created: 1) the teachers' learning manual, 2) a manual for the teachers to apply the knowledge that they had learned to develop their students, 3) the teachers' learning test, and 4) the critical thinking skills evaluation for the students. All four of these can be found on the following websites (Note: the original copies are in Thai.):

1) The Teachers' Learning Manuals: https://bit.ly/3OtcEEX
2) The Teachers' Self-Evaluation in applying what they had learned for student development: https://bit.ly/3OPpIUJ
3) The Teachers' Learning Test: https://bit.ly/3bzJcyi
4) The Students' Critical Thinking Skills Evaluation: https://bit.ly/3QSXydp

All the manuals, tests, and evaluations from the study led to the pre-experimental research with a one group pre-test/post-test design, which was carried out at the Faculty of Education, on the main campus of Mahamakut Buddhist University, which was randomly selected as the research area. There were 15 teachers from the departments of Thai, English, and Social Teaching, who had been purposively selected to be in the research group. In addition, there were 207 students, who were majoring in Thai, English, and Social Teaching, and who were also a target group of the study.

The results were as the researcher had hypothesized. "An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills" with 2 projects and each with manuals was proven effective according to the following criteria. Firstly, the results of the teachers' post-test followed the 90/90 standard. The first 90 referred to the percentage of the average score of the post-test. It was found that the teachers had scored an average of 32.73 out of 36 (92.96%), which was higher than the 90%. The second 90 referred to the number of teachers who had passed the test. Of the 15 teachers, 92.22% of them passed every part of the test.

Secondly, the result of the 15 teachers' learning pre-test was an average of 28.20 with 2.68 standard deviation, while the post-test average score was 33.47 with a standard deviation of 1.85. When the data was analyzed using the dependent t-test, it was found that the post-test scores had been statistically significantly higher than the pre-test (t value = 17.54, p >0.05).

Finally, the results from the evaluation of the critical thinking skills of the 207 students were as follows: the average value before the experiment was 3.48 with standard deviation of 0.53, whereas the post-evaluation value was 4.26 with standard deviation of 0.28. When the data was analyzed using the dependent t-test, it was found that the students' average score after the experiment had been statistically significantly higher than before the experiment (t value = 32.87, p >0.05).

6. Research Discussion

As mentioned previously, the researchers recognized the importance of a "knowledge-based society," which is a strategic term that is similar to "post-modern society," "post- industrial society," "experiential society," "consumer society", "risk society," "media society," or "information society," as well as similar terms, which aim at diverting attention to a certain aspect. The aspects that are particularly highlighted by the term 'knowledge-based society' are knowledge and education (Poltermann, 2014). A knowledge-based society is a society that generates, shares, and utilizes knowledge for the prosperity and well-being of its people (Zhou, 2016). Moreover, it refers to a society in which the creation, dissemination, and utilization of information and knowledge has become the most important factor in production. In such a society, knowledge assets (also called intellectual capital) are the most powerful producers of wealth, and as such, they have sidelined the importance of land, the volume of labor, and physical or financial capital (Knowledge Society, n.d.). Due to the recognition of the importance of a "Knowledge-based society", the literature review thereby focused on exploring critical thinking skills from many different experts from around the world, who have published their works. The researchers, who conducted the examination, found that some of them are famous academicians, experienced practitioners, and institutions that are dedicated to studying and developing the matter. The information is also of great quality and is easy to understand and put into action. Moreover, there is a sufficient amount to systemize and study in order to acquire further benefits for the development of the educational innovation: "An Online Program to Empower Teachers' Learning to Develop Students' Critical Thinking Skills."

Given that the importance of having a knowledge-based society has been recognized within both wider and smaller circles, the application of this idea has been applied to promote the development of educational innovations using Research and Development methodology. It is, thereby, a lesson from the study, which the researchers have agreed is truly useful and deserves to be published for the greater good.

At the same time, the researchers also recognized the importance of "a technologically-based internet society" which describes a society in which information technology and the Internet have been combined to transform the habits of human beings with regard to creating information, seeking information, and disseminating information. Most people today, at work and at home, have immediate access to a set of technologies that can support the production of high-quality printed materials. A succession of technological innovations, such as large-volume photocopiers, transferable word processing files, high-capacity printers, and Internet-based file transfer, have changed the ways in which we produce and distribute documents. We used to call some of this 'desktop publishing', but its facilities have become so pervasive that we can no longer distinguish them with their own label (Susskind & Susskind, 2016). Its definitions are as wide or as small as the ones for the word "knowledge-based society," which is mentioned frequently. In this research as well as those of Arnandho and Sutheejariyawattana (2022), Chobjai and Sanrattana (2022), Dhanapañño and Sutheejariyawattana (2022), Namjaidee and Dhammapissamai (2022), Niruttimatee and Sanrattana (2022), and Promrub and Sanrattana (2022) the researchers applied the idea to the development of the educational innovation in an e-book form to serve as a way of learning, as a guideline for the teachers' practice, and as an online program, which can be disseminated to benefit the target population by publishing their research conveniently, quickly, and efficiently. Furthermore, the researchers have realized the following benefits of online learning: 1) added flexibility and self-paced learning; 2) better time management; 3) the demonstration of self-motivation; 4) improved virtual communication and collaboration; 5) a

broader, more global perspective; 6) more refined critical-thinking skills; and 7) new technical skills (Miller, 2019).

7. Recommendations

In this research, in addition to using R&D methodology to develop an educational innovation that focus on "knowledge-based society" and "the technology-based internet society" also emphasizes the concept of teacher development and then allows teachers to continue to develop with students, concept of knowledge and action is power, concept dissemination of innovations from research results to the practical use of the target population, and concept of online self-study. However, there are many more innovative development ideas that the researchers would like to present to be studied and applied in more variety of R&D methodology with the goal of obtaining research results that are useful for broader application of the target population.

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Appendix

The Students' Critical Thinking Skills Self-Assessment

The Indicative Qualifications of Critical Thinking Skills	Scale				
	5	4	3	2	1
Problem Solving					
1. I take the questions or problems that I am facing seriously.					
2. I record my learning because it helps me to understand the assignments.					
3. When I have problems, I can resolve them.					
4. I can support my decisions with the information that I have received.					
5. I can explain things in a logical manner.					
6. I can critique the information about that matter I have.					
7. I can revise my hypothesis of what is being considered.					
8. I can understand what is unclear.					
9. I can make decisions and make assumptions by myself.					
Learning to Develop Critical Thinking Skills					
10. When I read, I can understand the intention of the writer.					
11. When I encounter something, I can think logically.					
12. I can make connections between subjects.					
13. I can develop my thoughts with my research.					
14. I make certain that the information I use is adequate.					
Critical Thinking Skills for Decision Making					
15. I usually rely on more than one source of information before I make a decision.					
16. When facing a problem, I see more than one solution.					
17. I think about the results before I do something.					
18. I plan to collect information about the topics that are being discussed.					
19. I make a list to help me think about a problem.					
20. I prioritize things according to their importance.					
21. I listen to different opinions.					
22. I am open to different opinions when making decisions.					

23. I am aware that sometimes there is neither a right nor a wrong answer.					
24. When I have an assignment, I work with people to collect ideas.					
Behavioral Indicators of Critical Thinking					
25. Class discussions help me to better understand the reading assignment.					
26. Class discussions help me to deeply explore my thoughts.					
27. I participate in class discussions.					
28. I record my learning because it is a good learning activity.					
29. I participate in a meeting before the group presentations.					
30. I prefer a class in which students can discuss their opinions.					