THE EFFECT OF ARCS APPROACH ON GEOGRAPHY CLASS

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ABSTRACT: *The aim of this study is to examine the effect of the ARCS motivational model, which includes four components on learning motivation of* **A***ttention,* **R***elevance,* **C***onfidence, and* **S***atisfaction, on geography class on junior high school students. A teaching approach based on the four components of ARCS was designed. The approach consists of four stages and ten steps. It includes: learner and course teaching-related information, learner motivation analysis, existing course analysis, learner motivation, goal establishment, teaching motivation design strategy development, integrated instructional design, Conduct actual course activity design, evaluation, and revision after the implementation of the course.*

The participants consisted of 38 8th-grade students at a junior high school. The experimental activity was deployed for 7 weeks. Pre-test and Post-test surveys were designed. The data were analyzed by descriptive statistics and t-test. The result shows that the ARCS approach has a significant effect on geography class. There were four suggestions to ensure ARCS approach works efficiently.

Keywords: ARCS motivation model, junior high school students

1. INTRODUCTION

The geography subject's scores of junior high school students' grades show a bipolar trend distribution with higher grades. Most of junior high students have no interest in the teaching-oriented teaching approach. They feel pressure and boring on the course and no longer have an interest in learning. Motivation is a critical issue of teaching. It is an indispensable condition for learning. It is also an issue that must be constantly confronted, reviewed and improved in education. However, most teachers think that they cannot inspire low motivation for learning. In fact, the key to the low motivation of students' learning may come from the teaching method or the content of the course does not conform to their learning style or interest, rather than the lack of learning motivation of the students themselves.

Therefore, it is necessary to adjust the teaching approach to encourage students and enhance their motivation to learn it. Most of the students feel pressure and boring on the course and no longer have an interest in learning. Motivation then is the key issue of teaching.

Keller [1] proposed the ARCS motivation model, which is a teaching model that combines with instructional design and aims to improve students' learning motivation. It can provide teachers as a reference for instructional design. The model is embedded in a theoretical base: the expectancy-value theory [1].

In order to improve the learning motivation in geography class, the ARCS motivation model is implemented in the class along with traditional teaching methods The research examined the significant difference with the four components of ARCS.

2. LITERATURE REVIEW

Teaching geography class suffers a couple of problems. First, the subject has been simplified to emphasize only the recitation of cognitive knowledge. The impression that geography class is a boring subject. It includes only mountains, rivers, places, railways, etc. The traditional teaching materials are not vivid and the content is not relevant to the actual life or needs. The students feel dull and boring and cannot cause their motivation to join the class.

Second, traditional geography teaching is generally based on the telling method. This teaching method is based on the "teacher-centered" teaching style. Learners only accept passive knowledge. Experts and scholars generally believe that too much emphasis is placed on the single injection of knowledge. There are few teachers-student interaction courses.

Third, there are limitations on traditional teaching materials. It includes the blackboard depicting the map time, the teacher's drawing capacity, the wall chart content may not meet the teaching needs, and lack of interaction between teacher and students.

Base on the above, learning motivation need to be improved to enhance study achievement. Motivation is associated with many variables affecting the learning process such as having a complex and multidimensional structure [2]. Keller [1,3] proposed the ARCS motivation model which has been applied to many subjects.

Keller's ARCS model is rooted in Vroom's notable expectancy-value theory [4]. The ARCS model [1] identifies four essential strategies for motivation instruction:

(1) Attention strategy is for arousing and sustaining curiosity and interest. Teachers should use different teaching material/environments to help stimulate learners' curiosity seeking [5].

(2) Relevance strategy is to link learners' needs, interests, and motives. Activities relevant to the learners' past experiences, prior knowledge, current interests, future expectations, or career goals can all help to support teachers in arousing students' positive attitudes towards instruction [6].

(3) Confidence strategy is to help students develop a positive expectation for successful achievement. It is essential that teachers should provide support to their students' needs [6].

(4) Satisfaction strategy is to provide extrinsic and intrinsic reinforcement for effort. The step consists of reinforcement, peer praise, equity, consistency, and cognitive feedback [7]. This model has been widely used in instructional materials and is an example of a well-documented design model that gives importance to the motivational aspects of the learners [8]. This model has also served as a template for developing and delivering a unit of instruction that motivates learning [1].

A study investigates the ARCS on the e-book. In the experimental group, students' anxiety scores were significantly lower than those in the control group. Their results showed that students applying the ARCS performed significantly superior on the mathematics achievement test and motivation survey. The findings also showed that the

e-book based on the ARCS motivation model had a significant effect on reducing students' anxiety intensities [9]. One other study also examined the effects of the ARCS motivation model on university prep class students' motivation. Their instructional design with detailed lesson plans was deployed for ten weeks. The results also showed students' instructional materials motivation was increased [10]. Moreover, the E-book study also implements ARCS to discuss the effect. A study applied ARCS on multimedia E-book to promote ESL language learning. There were sixty polytechnic students as participants in the study. The result showed that the model adduced a scope for implementing multimedia in a language class for adult learners [11]. The ARCS model was also applied to a micro lecture teaching platform. The research aimed to integrate Android and SQL server technology with ARCS to teach intelligent mobile devices. The course of civil engineering in universities and colleges implemented in this study was designed to test the practical value of this module teaching platform. The ARCS model was applied to examine the stimulation and maintenance of learners'' motives. The study focused on the interest in learning and strengthens. It also kept the interest of learners through a series of strategies to achieve the aim of learning. The result showed that the ARCS model was helpful for changing the present situation in teaching that the level of learners' motivation was weakening [12]. Another application of the ARCS model is a flipped classroom. A study aimed to determine the effect on the achievement, motivation, and self-sufficiency of students of the flipped classroom. There were sixty-six students divided into two classes of a physics course. Traditional lectures and flipped classrooms were implemented in one of the two classes. The collected data were obtained from the concept examination, motivation survey, and physics self-sufficiency scale. The results showed that the flipped classroom had better achievement than the traditional one. An increase in motivation in the flipped classroom was acknowledged.

Based on this researches, the ARCS model is applied in many fields and comes out with a positive effect on learners' motivation and achievement. As this study exam the ARCS strategy on geography class, we also follow the four components to design the teaching approach.

3. RESEARCH METHOD

This study was conducted using the quasi-experimental design and performing the pre-test and post-test in the same class. Before the intervention of the teaching experiment, the students have surveyed the ARCS learning motivation scale, and the average score of the regular assessment of the geography department in the 105-year school year was obtained as the pre-test. The experimental teaching was performed based on the ARCS model. It took 7 weeks. The motivational scale test and the final-exam of the geography section of the next semester in the 105th school year were used as post-tests to explore the effect of the ARCS motivation model.

(1) Research design

The aim of this study is to explore the influence of the ARCS motivation model on the students' learning motivation. A teaching approach based on the ARCS was then designed. Three units of geography were designed to follow the ARCS approach. The approach includes an introduction, activity designed, and unit review. There were 38 students of 8th-grade who participated in the geography class. Both pre and post questionnaires were deployed in this experimental class. The research hypothesis base on this purpose of this study is: Does the ARCS approach have a significant effect on the geography class?

The research subjects of this research teaching experiment are mainly based on the existing classes of the researcher's teaching school. The research adopts the "pre-experimental design" and "single-group pre-test design method" to conduct research. Before the intervention of the teaching experiment, the ARCS questionnaire was carried out for the students. The ARCS learning motivation questionnaire was also given after the 7th week of the experimental teaching to explore the influence of the ARCS motivation model into the geography class. The t-test was applied to the analysis of the data.

(2) Design and development of geography class

Based on the literature, the researcher designs the teaching process and teaching strategies of the ARCS motivation model. It evaluates the current status of the test class, determines the teaching unit, analyzes the course content, and arranges multiple teaching strategies in line with the content and nature of the course. Classes are arranged to attract attention and focus, establish relevance, give self-confidence, and provide satisfaction. finally assess students' academic motivation.

The instructional design process consists of four stages and ten steps. It includes: learner and course teaching-related information, learner motivation analysis, existing course analysis, learner motivation goal establishment, teaching motivation design strategy development, integrated instructional design, Conduct actual course activity design, evaluation and revision after the implementation of the course.

The four strategies of ARCS were designed based on the motivation factors and teaching strategy. They are described as follows.

1. *Attention*

Sensory attraction:
The use of online assessment instant feedback system to play an online video, display pictures, causing visual and auditory stimulation.

Inquiry into the problem:
• Use the online assessment instant feedback system.to ask questions, use questions that can lead to thinking, stimulate students' curiosity, and use life examples to ask questions.
• Use pictures, videos, and previous education exam questions to ask questions, trigger students' curiosity and promote high-level thinking.

Provide variability:
Use a variety of teaching media and change the way it is presented (text, images, animations, videos, advertisements, etc.)

2. *Relevance*

Object orientation:
• Clearly clarify the teaching objectives and learning priorities so that students understand the tasks and objectives of learning
• Provide a syllabus to enable students to master

the content of the unit
- Inform the relevance of teaching content to personal life or goals

Provide the needs of motivation:
- After understanding the students' interests, the teaching materials used in the teaching should be as close as possible to the students' prior knowledge, personal needs and life experiences.
- Provide opportunities for students to perform properly during the student process

Link familiar things:
- Convey effectively students' previous and present experiences
- provides more practical examples

3. Confidence

Prerequisites for study:
Set clear teaching objectives, let students know the performance requirements and assessment criteria, and help students create positive success expectations.

Successful acknowledge:
Textbooks and test assessments are designed to be difficult for students to complete. The assessments are made up of easy-to-difficult arrangements, allowing students to understand that they can complete classroom assignments and meet teacher requirements.

4. Satisfaction

Trivial outcome:
Provide students with the opportunity to apply newly acquired knowledge.

Fairness:
Use positive reviews to encourage students to create positive feelings about success.

(3) Measurement of geography course
This study uses geographical midterm and final exams to measure their academic performance. This score was appropriate to measure the results of the school section to explore students' learning motivation because according to the research observations of the subjects in the test class, the scores of the test are affecting students' self-confidence and satisfaction with geography learning. The important factors also directly affect students' learning motivation. The school taught by the researcher conducts three regular assessment tests per semester and takes about 6 to 7 weeks from the beginning of the semester. The main purpose is to assess whether the students have achieved proficient learning at each stage of learning, and Assessing the student's grades is a summative assessment.

The geography learning effectiveness test before and after the study was carried out by the geography teachers in three schools. It was then submitted to the geography teachers of the other two schools for review and correction, as the research results before and after the experiment.

(4) Instrument
The "Instructional Material Motivation Survey (IMMS)" was used to collect quantitative data. The IMMS was developed by Keller (1991), uses the five-point Likert scale: "strongly agree," "agree," "neutral," "disagree," and "strongly disagree". The original IMMS consisted of 36 questions and four

dimensions (attention, relevance, confidence, and satisfaction). The Cronbach's α of the overall questionnaire is 0.96 and the Cronbach's α for each of the sub-dimension ranges between 0.81 and 0.92. IMMS was applied as a pre-test and post-test to the experimental class.

4.   RESULTS

After the experimental research, the pre-test and post-test of four components were examined by descriptive statistic and t-test were used to analyze the data. The result shows the mean of the pre-test is 85.96 (SD=11.36) and the post-test is 91.48 (SD=12.34). It means that the average post-test is higher than pre one.

T-test was also used to analyze the pre-test and pro-test to exam if there is a significant difference. The result of the t-test shows that p-value < .01. It reveals that the ARCS approach has a significant difference between pre-test and post-test on students' motivation. The results of the t-test were shown in table 1.

For each component of ARCS, a t-test was applied to exam the difference. The p-value of attention, relevance, confidence, and satisfaction were all less than .05. It means that there was a significant difference between the pre-test and post-test. On the other words, the ARCS approach make difference in students' motivation.

Table 1: Result of t-test

component	test	Avg.	SD	*t*-value
Attention	Pre	20.24	2.22	2.143**
	Post	22.16	3.41	
Relevance	pre	21.80	3.35	2.874**
	Post	23.08	3.01	
Confidence	Pre	22.48	4.47	2.376*
	Post	23.52	3.85	
Satisfaction	Pre	21.44	3.11	2.898**
	post	22.72	3.66	

**p<.01   *p<.05

Based on the findings and our teaching experience, the researchers designed the course based on the ARCS motivation model, and proposed a motivation-guided strategy based on the four major components of ARCS and 10 teaching strategies, and developed the ARCS motivation model in the geography class. The design of teaching activities, through the attention and focus, establish the relationship, give self-confidence and provide satisfaction, effectively trigger and maintain the learning motivation of the students to achieve the promotion of geographical learning motivation. All the students in the test showed the greatest increase in "attention" in the change of motivation factors, followed by relevance, satisfaction, and confidence

CONCLUSION AND DISCUSSION

The purpose of this study is to explore the effect of applying the ARCS motivation model in geography class. Based on the ARCS approach, first of all, we designed an ARCS learning strategy in the class. Secondly, the research structure is proposed, and the questionnaire is compiled to develop a formal questionnaire for this study. Then, based on the results of the literature discussion, the experimental teaching of this research was developed, and the pre-experimental research method was used for teaching.

The research object of this study is 38 students of the eighth grade. The experimental teaching duration is 7 weeks. Each

class is taught once a week, and each class is required to effectively stimulate and maintain the students' motivation. After the end of the experimental teaching, the relevant information collected by the researcher, including the learning motivation scale pre-test, the learning motivation scale post-test, the learning effectiveness test pre-test, and the learning effectiveness test post-test. After the data is recovered, the average and standard deviation are discussed in order, and finally, the dependent sample t-test is performed for analysis. The results are (1) the learning motivation is improved after implementing the ARCS approach. (2) the four components of ARCS are all improved after implementing the ARCS approach.

The results show a positive effect on the ARCS approach. The geography teachers then are suggested to design an approach to enhance students' motivation based on the ARCS model. Four issues below would be supportive to implement it.

A. Integrating the ARCS motivation model and teaching strategies to improve students' learning motivation and academic performance

Motivation is an important issue of learning. Learning motivation affects the satisfaction of learning and the performance of learning. On other words, students who have high learning motivation can have high satisfaction with learning and have good learning performance. The ARCS motivation model is divided into four aspects, which are to attract attention and focus, establish relevance, give self-confidence, and provide satisfaction. When designing a course, teachers must first consider the content and attributes of the textbook. In the process of applying motivational strategies, first of all, through the attention strategy to stimulate students' attention and motivation for teaching. Then using the establishment of relevance strategies to link the teaching content with the needs of students and life experience. Furthermore, by giving self-confidence strategies and providing a sense of satisfaction strategy, students will have a positive feeling about their abilities and learning outcomes, then enhancing their motivation.

B. Teachers need to consider the learning needs and student's characteristics of different competency and adopt appropriate teaching strategies to enhance students' academic performance achieved

Teachers should first understand students' prior knowledge and their life experience, and then design the appropriate teaching materials accordingly. Increasing students' familiarity with the textbooks, it is important to make the teaching approach consistent with their abilities. In addition, teachers should assist students in establishing appropriate learning objectives so that they can adjust their learning strategies.

C. Teachers need to enhance the strategy of teaching to improve the teaching presentation

After enhancing the teaching profession and exerting the research essence, teachers can integrate into the teaching process with the ARCS motivation model. Then it would be able to eliminate the difficulties encountered in the design planning and teaching activities. In the process of experimental teaching, the expression of spoken language and body language is also the key to improve motivation. If teachers can use rich oral and physical actions, and then use

verbal rewards, encourage students to participate in discussions and answer questions to increase student confidence and make them more willing to participate in the class.

D. Teachers should exam their teaching approach and review the amendments as well

The ARCS motivation model provides an approach for teachers to diagnose their own instructional design. Teachers can develop questions based on the four motivational elements of the ARCS motivation model and their sub-component. For example, how do I motivate students? exploring the attitude of the problem? How do I link my students' experiences with teaching? How do I mature students to look forward to the successful completion of this course? How do I make students know that success is in their own efforts? Both checking the teaching's compliance at any time and observing the students' motivation enhance the learning performance. If students are found to have poor response, they must immediately review the teaching strategy and really examine the advantages or inadequacies of the instructional design, and evaluate the application in the actual situation. Correction and improvement of teaching would solve the difficulty.

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