

“THE USE OF ARCS (ATTENTION, RELEVANCE, CONFIDENCE, SATISFACTION) METHODS TO IMPROVE STUDENT LEARNING OUTCOMES IN LEARNING DECISION MAKING THEORY”

Putu Nina Madiawati¹, Aan Komariah², Imanuddin Hasbi³, DedyAchmad Kurniady⁴, Nani Hartini⁵

^{1,3}Telkom University, Faculty of Communication and Business, Business Administration, Indonesia. ^{2,4}Universitas Pendidikan Indonesia, School of Postgraduate, Educational Administration, Indonesia. E-mail: ¹pnamad@telkomuniversity.ac.id,

²aan_komariah@upi.edu ³imanhasbi@telkomuniversity.ac.id, ⁴dedy_achmad@upi.edu, nani_hartini@upi.edu

ABSTRACT:

The purpose of this study was to find the illustration about the implementation of the Attention, Relevance, Confidence, Satisfaction (ARCS) learning model and to find the mechanism of ARCS model implementation by the lecturer to improve student learning outcomes. The method used was classroom action research (CAR) in three classes of Decision Making Theory courses. In the first cycle the results of the pre-test and post-test there was an average increase of 19.91%, while in the second cycle the results of the pre-test and post-test results increased an average of 19.82%. It showed there is consistency in achieving results in each cycle. Student learning outcomes from Scorer average Mid-Term Exam and Final-Exam, there was an increase of 8.28% which obtained the final Passed result of 88.24%. This resulted in a decline in the number of Passed from the previous academic year by 5.95%. The final score planned in the classroom action research is the Final Score based on the individual Scoreper of students who got a Score ≥ 65 , as much as 72.27% which was distributed by Score A, AB, B and BC. These results indicated that the learning method with ARCS had succeeded in improving student learning outcomes in the course of Decision Making Theory.

Keywords

ARCS Methods, Classroom Action Research, Decision Making, Learning Outcome

Article Received: 18 October 2020, Revised: 3 November 2020, Accepted: 24 December 2020

INTRODUCTION

Decision Making Theory is one of the courses taught in the Business Administration Study Program (Adbis Study Program). Initially this course is called the Quantitative Method, in line with the curriculum change in the 2016/2017 school year in the Business Administration Study Program, the Quantitative Method course changed its name to Decision Making Theory..

The reality in the field shows that the results of students' achievement on this subject are low, this is due to the assumption that learning Decision Making Theory (quantitative methods) is the same as learning mathematics which is difficult and very boring. This assumption will affect student learning achievement that indirectly influences the

success of learning in Decision Making Theory (quantitative methods). On the results of student achievement for the course of Decision Making Theory (quantitative methods) in the Academic Year 2015/2016, the achievement of Score above 65 was only 48% while Score under 65 reached 52%.

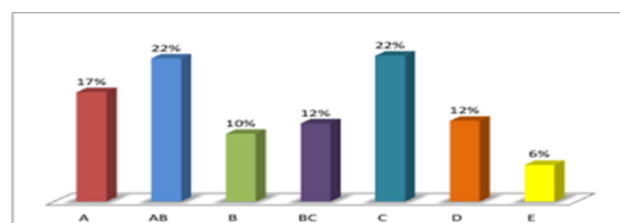


Figure 1. Graph of Decision Making Theory Value (Quantitative Method) Academic Year 2015/2016

From Figure 1 it can be seen that the achievement of Score above 65 is not optimal, learning outcomes are still dominated by Score C (Score 50-60) as much as 22%, Score D (Score 40-50) as much as 12%, and Score E (Score <40) as much as 6%. The above phenomenon is one of the challenges that must be faced by lecturers of Decision Making Theory (quantitative methods). How to improve student learning outcomes in the course of Decision Making Theory (quantitative methods).

To teach effective decision making courses requires the ability of lecturers in learning methods. As a professional lecturer, learning methods are competencies that cannot be ignored in teaching practice. Learning methods using ARCS (Attention, Relevance, Confidence, Satisfaction) are thought to be able to improve students' understanding of abilities that must be realized in a course. Most ARCS methods are used to improve and increase motivation in learning (Li, K., Moore, DR, 2018; APA Gormley, Denise K., Colella, Christine., Shell, Dustin L., 2012; Intan Naumi Putri Putri, Mochammad Ahied, Irsad Rosidi, 2019). However, this research is used to improve learning outcomes by referring to the benefits of the ARCS model that is making students more active, not saturated, and easier to understand learning material (Intan, et al, 2019). In addition, the ARCS method can be applied in learning any field of study because its flexibility (Molae, 2014).

LITERATURE REVIEW

ARCS is a learning method by increasing student motivation. Keller (2006) states that ARCS is a learning method by increasing motivation. Motivation consists of a number of efforts that someone wants to achieve his goal (Keller, 2006a). Motivation in learning must be in the form of tactics that must support instructional goals (Keller, 2006b). ARCS learning is an

extension of: 1) Attention (A), that encourages students 'curiosity and interest, 2) Relevance (R), that is related to students' experiences and needs, 3) Confidence (C) namely success and meaningful student assignments, 4) Satisfaction (S), that is to build student appreciation and achievement. Thus, this learning model prioritizes student attention, adapts learning material to student learning experiences, creates self-confidence in students, and creates a sense of satisfaction in these students.

ARCS research results are not only directly on solving motivational problems but there are also those whose research is directed at improving student academic achievement and the results are proven if ARCS can significantly improve student achievement (Karabatak, S., Polat, H., 2019). Likewise the results of research by Rifda Alfiyana, Sri Sukaesih, Ning Setiati (2018) about the effect of the ARCS Model (Attention, Relevance, Confidence, Satisfaction) with the Talking Stick Method on Motivation and Student Learning Outcomes of the Food Digestion System Material concluded that this method was successful. Other research is shown by Fatimah & Abdullah (2013) that applying direct learning model with ARCS motivational strategies has a positive effect on student learning outcomes. Thus, it is clear that the ARCS method can be used to improve student learning outcomes (Sholihah, Jamal, & Salam 2016; Orrahmah, A., An'nur, S., & M., AS, 2016; Ahliha, Mastuang, & Mahardika., 2017).

The ARCS method developed by John M. Keller (2006a) consists of Attention, that is, feeling of being attracted to a problem studied, Relevance, that is the relationship or appropriateness of learning material presented with student learning experiences, Confidence, that students dare to appear in the learning process to show their existence, satisfaction is a feeling of joy and positive acceptance of his achievement. This method not only succeeded in increasing motivation to learn, but also succeeded in achieving learning outcomes. Learning outcomes

are the level or magnitude of behavior change that can be achieved from an experience and leads to the mastery of mastery of knowledge, skills, and habits (Maseleno et al., 2019). Learning outcomes are the culmination of learning activities.

Changes in knowledge (cognitive), attitude (affective), and behavior (psychomotor) are continuous and dynamic and can be measured or observed (Huri Suhendri, 2013). According to Benjamin S. Bloom (1956) learning outcomes are grouped into three aspects, namely cognitive aspects, affective aspects, and psychomotor aspects. Cognitive learning outcomes, aspects related to thinking skills consisting of six levels, namely knowledge, understanding, application or application, analysis, synthesis, and evaluation. Affective learning outcomes, related to the internalization of attitudes and scores consisting of five levels, namely receiving, responding, appreciating, managing, and characterizing with one Score or complex score. Psychomotor learning outcomes, related to motor skills and individual acting abilities. Psychomotor also has six levels, namely reflexes, basic movements, perceptual abilities, physical abilities movements, skilled movements and beautiful and creative movements.

RESEARCH METHODS

This study used ARCS Classroom Action Research (attention, relevance, confidence and satisfaction). This method was used to improve student learning outcomes. The procedures of this research are: 1) Preparation stage, the activities at this stage are adjusting the semester learning plan, making pretest and posttest questions, and making observation sheets. 2) The implementation stage, are: a) provide a pretest to find out the student's entry behavior, b) Carry out learning by using the ARCS learning model (Attention, Relevance, Confidence, and Satisfaction), c) During learning the observations are made on student activities in learning with ARCS. d) Making a summary of

learning material, e) giving a posttest. 3) Reflection Stage, that examines all test documents and sheets and identifies problems that occur in the first cycle that cause suboptimal results in cycle 1 based on observations and tests. Then arrange the second cycle step based on input from reflection cycle 1. Subjects in this study were students of Telkom University Decision Making Theory 2016/2017 academic year in three classes, namely Class AB-38-01 = 48 students, AB-38-02 = 47 students, and AB-38-03 = 24 students.

RESULTS

The result of the first cycle obtained from the learning process of ARCS (Attention, Relevance, Confidence, Satisfaction) of the study is Linear Programming Model: Simplex Method. The study material is expected to show an increase in student motivation and learning outcomes, but the results obtained have not yet reached the target of CAR. The following is a report on the results of the implementation of PTK grants up to the 2016/2017 Academic Year Mid Term Examination (UTS), with the following presentation structure:

1. Cycle 1 Results

A. Planning

The planning stage in this research is all forms of preparation and action plans that will be carried out on learning to improve student activities and learning outcomes, including: preparing Semester Learning Plan (RPS), determining teaching material, designing learning models to be used, providing direction for following the learning procedure, provide practice time for students, prepare learning outcomes tests, prepare student observation sheets (observation)

B. Action .

The action chosen to overcome this problem is an effort to increase the activity and learning

outcomes of decision making theory through the application of the ARCS learning model. The

Steps taken are :

No	Lecturer Activities	Student Activities
1	The lecturer starts the lesson and motivates students to be enthusiastic in participating the learning	Students pay attention and listen to the lecturer's explanation
2	Lecturers provide stimulus to students by giving questions related to the material to studied → <i>Attention</i> (A)	Students pay attention and listen
3	The lecturer describes the aims and benefits of learning to be presented along with examples that are linked in real life → <i>Relevance</i> (R)	Students pay attention and listen
4	The lecturer appoints students to give other examples that students have experienced → <i>confidence</i> (C)	Students actively give examples
5	The lecturer gives an appreciation of the answers given by Satisfaction students → <i>Satisfaction</i> (S)	Students collect points from appreciation given by the lecturer

Table1. Preliminary Activity

2.Core Activities

No	Lecturer Activities	Student Activities
1	The lecturer gives material for 15 minutes and relates learning to daily activities (A)	Students pay attention, listen, and record lecturer explanations
2	Lecturer provides exercises in the form of sample questions related to the material being taught (A&R)	Students pay attention, listen and record lecturer explanations
3	The lecturer gives exercises several items related to the material being taught, then appoints one student to answer the practice questions in front of the class (R&C)	Students come to the front of the class and answer questions from practice questions given by the lecturer
4	The lecturer asks students about the difficulties they felt while working on the exercise questions (C)	Students tell what their difficulties when working on the exercise questions
5	The lecturer asks students who have mastered the material taught to help their friends who have not mastered the material taught (S)	Students who have mastered the material being taught help explain the material taught to friends who do not understand the material

Table2. Core Activities

3. Closing

No	Lecturer Activities	Student Activities
1	The lecturer concludes the lesson discussed (A)	Students pay attention and listen
2	Students are given practice questions related to the material being taught (R)	Students work on the tests given by the lecturer
3	Students are able to complete the given practice questions (C)	Students record assignments given by the lecturer
4	Students get an appreciation in the form of Score (S) points	Students listen and pay attention

Table3. Closing Activites

C. Observation of Cycle I

The Results of *Pre Test*

Measurement of learning begins with a pretest to measure the readiness of students in receiving lessons. The results obtained in cycle 1.

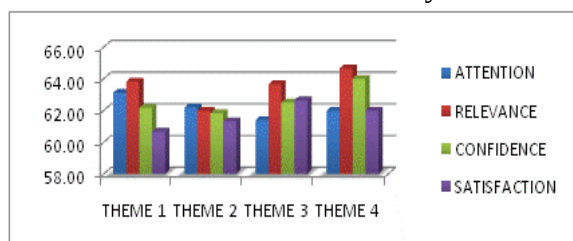


Figure 2. The Results of *Pre Test* Cycle 2

In the first cycle, pre-test was done on each theme for attention with an average score of 62.18, an average score of 63.54, confidence with a score of 62.63, and satisfaction with an average score of 61.67. From the pre-test results the results were still below 65, but the understanding of the material to be presented can be accepted independently by students.

The Results of *Post Test*

Measurement of learning begins with conducting a post test to determine student learning outcomes in receiving lessons. The results obtained in cycle 1.

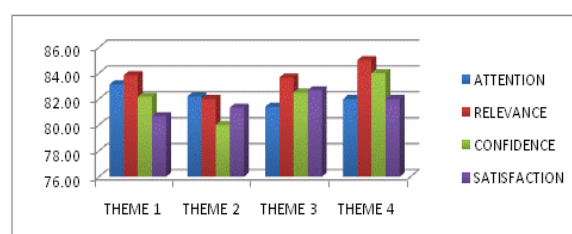


Figure 3. The Results of Cycle I *Post Test*

In the first cycle, post tests were carried out on each theme for attention with an average score of 82.18, a relevance score of an average of 83.63, a confidence level of an average score of 82.17 and satisfaction with an average score of 81.67. From the results of the post test can be seen after students get the material presented by the lecturer, students understand the material presented more, students are more confident to provide examples that are relevant in accordance with the existing case. From all these activities, students become more satisfied because they can answer the questions and get points or rewards given in additional score from all questions presented.

Cognitive Aspect

The cognitive aspect is the assessment of learning outcomes towards the student's Score achievement. Measurement was conducted on 119 students who were divided into three classes which obtained a score of each class as follows:

Class	Question				Average Score
	1	2	3	4	
AB-38-01	9.59	12.18	12.31	18.78	52.86
AB-38-02	12.35	14.39	14.89	18.48	60.11
AB-38-03	13.33	15.21	16.46	22.29	67.29
Total Average Score					60.09

Table4. The Average Score per Class

The overall average score was 60.09 with the percentage of students 60.09%. This assesment is measured based on the results of tests / written examinations during the Midterm Examination.

Psychomotor Aspects

Psychomotor aspects related to the ability of students to demonstrate expertise and skills in the classroom. For the evaluation of psychomotor

aspects observed during the learning process. For the assessment of psychomotor aspects, only 3 classifications of activities were taken, namely writing activities (exercises and examinations), drawing activities (organizing stages of work), and motor activities (doing exercises). The learning activities is calculated from Mid-Term Examination based on the individual Score of students who get a Score ≥ 65 , with the following data:

Table5. Percentage of Psychomotor Aspect of Student Passed

Class	Passed Percentage	Complete (Score ≥ 65)	Not Complete (Score < 65)	Total
AB-38-01	The Number of Student	25	23	48
	Passed Percentage	52.08%	47.92%	100%
AB-38-02	Total	19	24	47
	Passed Percentage	59.57%	40.43%	100%
AB-38-03	Total	15	9	24
	Passed Percentage	62.50%	37.50%	100%

Affective Aspects

Affective aspects related to the ability of students to behave and be active in participating in class activities. For affective perspectives, five classifications of activities were taken, namely visual activities (experiments in the form of class exercises), oral activities (asking questions, expressing opinions, giving suggestions, discussion), mental activities (assuming, remembering, solving problems, analyzing

decision making), listening activities (listening description, discussion), and emotional activities.

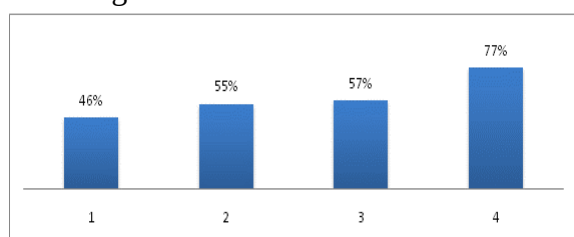
The activity was observed while learning took place. The learning activities were calculated from individual student scorers covering pre-test, post-test and class activities that get a Score of 65 with the following data:

Class	Passed Percentage	Passed (Score $\geq$ 65)	Not Passed (Score $<$ 65)	Total
AB-38-01	The Number of Student	43	5	48
	Passed Percentage	89.58%	10.42%	100%
AB-38-02	Total	44	3	47
	Passed Percentage	93.62%	6.38%	100%
AB-38-03	Total	20	4	24
	Passed Percentage	83.33%	16.67%	100%

Table6. Percentage of Affective Student Aspect Passed

D. Analysis and Reflection

After the learning process is carried out using the ARCS Method (Attention, Relevance, Confidence, Satisfaction) in the first cycle the following results are obtained

**Figure 4.** Percentage of Student Ability to Answer Mid Exam Questions

In Figure 4, it can be seen the ability of students in answering questions given in the Midterm Examination (UTS), where questions 1 represent the RPS in weeks 1 and 2, questions 2 represent RPS weeks 3 and 4, questions 3 represents RPS week 5 and questions 4 represent RPS

2. RESULTS OF RESEARCH CYCLE II

1) Cycle 2 is done as cycle 1 but with different material and with the touch of treatment according to input of cycle 1, namely:

2) Generating and stimulating the attention and interest of students by using video media in presenting cases, facts in providing examples of concepts and involving students in providing examples of cases they experienced relating to the material.

3) In presenting the material it is also explained the benefits of the knowledge they will get by

providing examples that relate directly to the material presented.

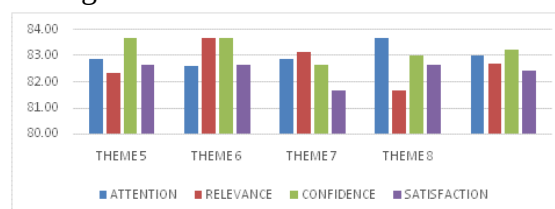
4) Provide motivation to students by inviting students who lack confidence in working on problems to be able to work on problems in front of the class together. This is intended to grow confidence when resolving a case.

5) Give verbal praise, give informative feedback to students in working on the problem.

Results of Post Test

Cycle 2 was not performed pretest, used passing standards to measure the achievement of posttest that did not compare with pretest.

The posttest results obtained in cycle 2 can be seen in Figure 6.

**Figure 6.** Results of CYCLE II Post Test

From the results of the post test it can be seen after students get the material presented by the lecturer, students understand the material presented more, students are more confident to provide examples that are relevant in accordance with the existing case. From all these activities, students become more satisfied because they can answer questions and get the rewards given in additional score from all the questions presented.

Presentation Results

The presentation is presented as a group assignment, where in this presentation students are

based on ARCS indicators based on cognitive, affective and psychomotor aspects that have been integrated in an assessment of the results of the

presentation. The indicators used in the measurement of presentations are as follows:

METODE	INDIKATOR	PRESENTASI
ATTENTION	1. Metode penyampaian dalam proses pembelajaran	Tampilan Slide Presentasi
	2. penggunaan media audio dan visual	Tampilan Media Audio/Visual yang digunakan
	3. ice breaking pada saat proses pembelajaran	Dapat menguasai audien
	4. contoh - contoh dalam peristiwa nyata	Kesesuaian peristiwa nyata dengan materi
	5. gunakan teknik tanya jawab	Mampu menjawab pertanyaan yang diajukan
RELEVANCE	1. menyampaikan tujuan pembelajaran	Dapat menyampaikan tujuan pembelajaran
	2. menyampaikan manfaat hasil pembelajaran dalam kehidupan nyata	Dapat menyampaikan hasil pembelajaran dalam kehidupan nyata
CONFIDENCE	1. membuat mahasiswa merasa optimis dan percaya diri saat proses belajar	Adanya keberanian dalam mengemukakan pendapat
	2. mahasiswa merasa lebih mudah mempelajari materi yang disampaikan	Adanya keberanian dalam penyampaian presentasi
SATISFACTION	1. memberikan penghargaan terhadap hasil belajar mahasiswa	Adanya rasa puas setelah presentasi dilaksanakan

Table10. ARCS Indicator

The results of the measurements during the student's presentation are as follows:

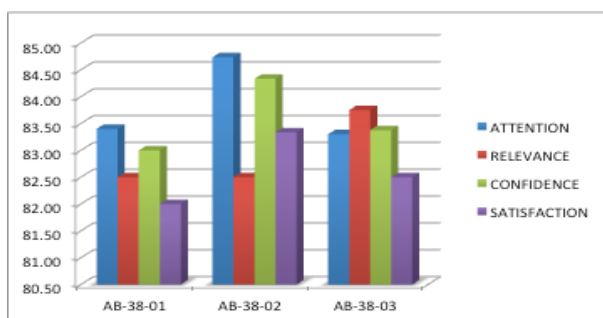


Figure 7. Assesment of Presentation Results

From the results of the presentation it can be seen how students make a display of teaching aids sufficient to attract the audience's attention. It can be seen with an average score of 83.81. Understanding of the material presented can be seen when students link material with cases in the real world, it is measured with relevance of Average Score of 82.92 and overall conclusion assessment of presentations with satisfaction of 82.61.

The Results of Cylce II Reflection

After the learning process is carried out using the ARCS Method (Attention, Relevance, Confidence, Satisfaction) in the first cycle the following results are obtained:

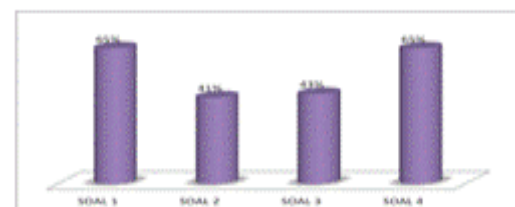


Figure 8. Percentage of Student Ability in Answering Final Exam

In Figure 8 it can be seen the ability of students in answering questions given in the Final Exam , Questions 1 represent the RPS in the 8th and 9th week, question 2 represents the RPS in the 10th and 11th week, questions 3 represents the 12th and 13th week of the RPS and the 4th question represents the 14th and 15th week of the RPS.

Based on the data contained in Figure 8 above, the analysis can be as follows: 1) Basically, students answer correctly on question no. 2 and 3 but there is no no final conclusion given from the answering the questions in accordance with the

questions raised; 2) The understanding of the material delivered on average is almost the same, this is due to a comfortable and pleasant learning atmosphere, students are motivated to improve learning outcomes and indirectly students are competing to work on problems in front of the class.

Overall Results Analysis

The results obtained in cycle 1 and cycle 2, it showed an increase in achievement of the final score of students. The final score data obtained by 119 students for three classes is as follows:

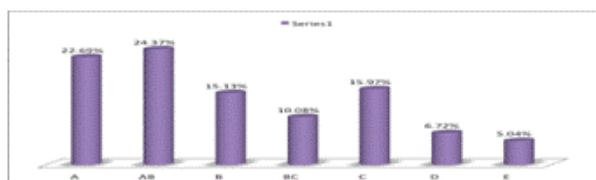


Figure 9. Percentage of Student Passed

Course Code	Course	Before		After	
		A, A-, AB, B+, B, B-, BC, C+, C	D, E, T, K	A, AB, B, BC, C	D, E, T, K
BAH3J3	TeoriPengambilan Keputusan (TPK)	82.29%	17.71%	88.24%	11.76%

Table14. Comparison of Passed Score

DISCUSSION

The ARCS method is related to four component models, namely: Attention that is arousing and maintaining student attention during learning, Relevance that is Linking learning to student needs, Confidence that is Fostering self-confidence in students, Satisfaction namely Generating student satisfaction towards learning can be applied in the delivery Decision Making Theory. This shows that the ARCS method is not only specific to improving student learning that

HasilUjianAkhir Semester menunjukkan tingkat kelulusan mahasiswa 88.24% dengan sebaran Score A, AB, B, BC dan C yang adapada Figure 9. Sedangkan untuk Score akhir yang direncanakan pada penelitian tindak kelas adalah Score akhir berdasarkan Score per individu mahasiswa yang mendapatkan Score ≥ 65 , sebanyak 72.27% yang sebaran dengan Score A, AB, B dan BC. Hasil tersebut menunjukkan bahwa metode pembelajaran dengan ARCS telah berhasil meningkatkan hasil belajar mahasiswa pada mata kuliah Teori Pengambilan Keputusan.

Apabila dibandingkan dengan tahun akademik sebelumnya terjadi peningkatan angka kelulusan sebesar 5.95% pada sebaran Score A, AB, B, BC dan C. Sedangkan untuk Score sebaran D dan E terjadi penurunan sebesar 5.95%. (table 14)

lacks motivation to learn, but it can also be used to improve student learning outcomes. It can also be understood that the achievement of student learning outcomes is obtained from learning efforts that have successfully motivated students to learn (Sussi, Fitriyanti, N., Komariah, A., Kurniady, D.A., 2019). Keller stated (1987), that the ARCS learning model is a form of problem solving approach to design aspects of motivation and learning environment in encouraging and maintaining student motivation to learn. This high

learning motivation becomes the mediator for the achievement of student learning outcomes. The ARCS learning model is closely related to motivation, especially the provision of motivation so that students gain new knowledge (Nugraha, et al, 2014).

The ARCS method succeeded in achieving student learning outcomes according to the learning plan is inseparable from the strategy of arousing student attention by the lecturers suggested in this method. Wena (2009: 36) revealed that there are three types of strategies to arouse students' attention during learning, namely: 1) Generating students' perceptions, 2) Fostering desires to research, and 3) Using varied elements of learning. Whereas Keller (1987) explained several strategies to maintain and increase student attention, as follows: 1) Use delivery methods in various learning processes (class, group discussion, role playing, simulation, brainstorming, demonstration, case studies). 2) Use the media (media of view, audio, and visual) to complete the delivery of learning material. 3) If you feel appropriate use humor in the learning process. 4) Use real events, and examples to clarify the concepts used. 5) Use questioning techniques to engage students.

The use of ARCS in learning to achieve student learning outcomes is inseparable from the advantages of this model, as expressed by Awoniyi, LeJeune, Mostek, Muller Rundle (1997: 30), that this ARCS learning model has advantages, as follows: 1) Providing guidance: active and give direction on what students must do, 2) How to present the material with the ARCS model is not only with theories whose application is less interesting, 3) Motivational models that are strengthened by the design of student-centered learning forms, 4) The application of the ARCS model increases motivation to repeat other material that is essentially less interesting, 5) Overall assessment of abilities more than the characteristics of students so that learning strategies are more effective.

CONCLUSION

Descriptive analysis results showed that the atmosphere of a pleasant learning environment can motivate students to accept material that will be delivered by the lecturer. Assignments given by the Lecturer can be well received and done in accordance with the instructions available. During the learning process measurements are made using ARCS indicators in assessing pre-test, post-test and presentation. In the first cycle the results of the pre-test and post-test there was an average increase of 19.91%, while in the second cycle the results of the pre-test and post-test results increased an average of 19.82%. For the average presentation obtained was 83.23%.

Improved student learning outcomes can be seen from the average score Mid-Exam and Final-Exam where an increase of 8.28% was obtained the final Passed result of 88.24%. This resulted in a decline in the number of Passed from the previous academic year by 5.95%. Thus, the ARCS method can be used to improve student learning outcomes.

REFERENCES

- [1] Ahliha, S., Mastuang, M., & Mahardika, A. I. (2017). Meningkatkan Hasil Belajar Siswa Kelas Viii E Smp Negeri 26 Banjarmasin Dengan Menggunakan Metode Pemecahan Masalah (Problem Solving) Dalam Setting Pengajaran Langsung. *Berkala Ilmiah Pendidikan Fisika*, 5(1), 118–132.
- [2] APA Gormley, Denise K. PhD, RN; Colella, Christine MSN, CS, CNP; Shell, Dustin L. MA, CTS. (2012). Motivating Online Learners Using Attention, Relevance, Confidence, Satisfaction Motivational Theory and Distributed Scaffolding. *Nurse Educator: July/August*

- 2012 - Volume 37 - Issue 4 - p 177-180.
doi:10.1097/NNE.0b013e31825a8786
- [3] Awoniyi, LeJeune, Mostek, Muller Rundle (1997). *Strengths and weaknesses of ARCS model. Dalam Hariyono.2013. Kelebihan dan Kekurangan Model Pembelajaran ARCS.* <http://www.hariyono.org/2010/10/model-arcs-keller.html> (diakses pada: 21 April 2020)
- [4] Bloom, Benjamin S. (1956). *Taxonomy of Educational Objectives : The Classification of Educational Goals, Handbook I Cognitive Domain.* New York : Longmans, Green and Co
- [5] Fatimah, N. & Abdullah, A. A. (2013). Pengaruh strategi motivasi attention, relevance, confidence, satisfaction (arcs) dalam model pembelajaran langsung terhadap hasil belajar siswa pada pokok bahasan listrik dinamis di kelas x sma negeri 18 surabaya. *Jurnal Inovasi Pendidikan Fisika.* 2(2). 75-77.
- [6] Intan Naumi Putri Putri, Mochammad Ahied, Irsad Rosidi. (2019). Pengaruh Model Pembelajaran Arcs (Attention, Relevance, Confidence, Satisfaction) Terhadap Self Esteem. *Natural Science Education Research, Vol. 2 No.2.*
- [7] Karabatak, S., Polat, H. (2019). The Effects Of The Flipped Classroom Model Designed According To The ARCS Motivation Strategies On The Students' Motivation And Academic Achievement Levels. *Educ Inf Technology* (2019). <https://doi.org/10.1007/s10639-019-09985-1>
- [8] Keller, J. M. (2006a). ARCS design process. Retrieved September 7, 2010 at <http://arcsmodel.com/Mot%20dsgn%20A%20prcss.htm>
- [9] Keller, J. M. (2006b). What is motivational design. Retrieved September 7, 2010 at <http://arcsmodel.com/Mot%20dsgn%20Mot%20dsgn.htm>.
- [10] Keller (1987), Development and Use of the ARCS Model of Instructional Design. *Journal of Instructional Development.* Vol 10, No. 3, Hal 3. Florida State University
- [11] Li, K., Moore, D.R. (2018). Motivating Students in Massive Open Online Courses (MOOCs) Using the Attention, Relevance, Confidence, Satisfaction (ARCS) Model. *J Form Des Learn* 2, 102–113. <https://doi.org/10.1007/s41686-018-0021-9>;
- [12] Maseleno, A., Huda, M., Jasmi, K. A., Basiron, B., Mustari, I., Don, A. G., & bin Ahmad, R. (2019). Hau-Kashyap approach for student's level of expertise. *Egyptian Informatics Journal*, 20(1), 27-32.
- [13] Molaei, Z., & Dortaj, F. (2014). Improving L2 Learning: An ARCS Instructional-Motivational Approach. *Procedia: Social & Behavioral Science.*
- [14] Nugraha, I. G. N. W., Lasmawan, I. W., & Tika, I. N. (2014) "Pengaruh Strategi Pembelajaran Arcs (Attention, Relevance, Confidence, and Satisfaction) Terhadap Hasil Belajar Siswa Dengan Kovariabel Motivasi Belajar Dalam Pembelajaran IPA." *Jurnal Pendidikan Dasar Ganesha*, vol. 4, no. 1, 2014.
- [15] Orrahmah, A., An'nur, S., & M., A. S. (2016). Meningkatkan hasil belajar melalui model pengajaran langsung

dengan metode problem solving pada pembelajaran fisika di kelas xii ipa 1 sman 10 banjarmasin. *Berkala Ilmiah Pendidikan Fisika*, 4(2), 127–136.

- [16] Rifda Alfiyana, Sri Sukaesih, Ning Setiati. (2018). Pengaruh Model ARCS (Attention, Relevance, Confidence, Satisfaction) dengan Metode Talking Stick Terhadap Motivasi dan Hasil Belajar Siswa Materi Sistem Pencernaan Makanan. *Journal of Biology Education* 7 (2): 226-236.
<http://journal.unnes.ac.id/sju/index.php/ujbe>
- [17] Sholihah, R. M. M., Jamal, M. A., & Salam, A. (2016). Meningkatkan motivasi belajar fisika siswa kelas x ms 6 di SMA Negeri 2 banjarmasin melalui strategi arcs dalam setting pengajaran langsung. *Berkala Ilmiah Pendidikan Fisika*, 4(2), 144–151.
- [18] Suhendri, Huri. (2013). Pengaruh kecerdasan matematis–logis dan kemandirian belajar terhadap hasil belajar matematika. *Jurnal Formatif* 1(1): 29-39
- [19] Sussi, Fitriyanti, N., Komariah, A., Kurniady, D.A. (2019). Active physics learning with contextual teaching learning methods. *International Journal of Innovation, Creativity and Change*, 9(2), pp. 345–356
- [20] Wena, Made (2009). Strategi Pembelajaran Inovatif Kontemporer Suatu Tinjauan Konseptual Operasional. Jakarta: Bumi Aksara.