



Student's Motivation and Outcome by ARCS (*Attention, Relevance, Confidence, Satisfaction*) Learning on Ecosystem Concept

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Abstract

This study would determine the learning of class X MA Al Asror students in biology teaching and learning activities with ARCS learning. The sample is class X MIA 1 and determined by simple random sampling. The results of the t-test on the scores of students' learning motivation obtained sig. value of $0,000 < 0,05$, r value is $0,774$, and calculated t value is $-16,658$ which shows that there is a difference between students' learning motivation in non-ARCS learning and students' learning motivation in ARCS learning and there is a relationship between ARCS learning and students' learning motivation with the contribution of 60%. The raise of students' learning motivation is analyzed by N-gain test with the average N-gain score of 0.39. The classical completeness in non-ARCS learning is 0% while in ARCS learning is 66.67%. The result of multiple correlation of learning motivation and student performance on learning outcomes show r^2 of 0.241.

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INTRODUCTION

Student learning outcomes have three domains of competence including attitude, skill, and knowledge of the students (Ministry of Education and Culture, 2013). The learning outcomes can be influenced by various factors, according to Walgito (2004), one of the factors that influence the learning outcomes is learning motivation. The learning motivation involves students' dream or aspiration so that it is expected that the students who have the learning motivation understanding the learning objective; in addition, the good condition of the students in learning will cause those students being enthusiastic in learning and able to complete the task well.

Motivational problem is an important problem for students. The learning motivation of students has variation in high and low, so the teacher's responsibility is to encourage the potential of the motive to be concentrated on the learning process (Abidin, 2006). The motivation appears in an individual when there are conditions outside the individual that become the cause of the needs for something. As a result of these needs, the students will be motivated to carry out their activities in order to satisfy their needs. If the motivation in the individual is strong then he will actively carry out activities to satisfy his needs; otherwise, if the motivation in the individual is weak, he will be less active in satisfying his needs. Nasution in Abidin (2006) argues that a person's needs always change throughout his life. Something that is interesting and desirable at one time is no longer wanted at other times. That is why the motivation must always be seen as a dynamic thing.

In line with the opinion of Nasution *et al.* in Dimiyati & Mudjiono (1994), the learning motivation in students can be weak, the weak motivation will weaken activities so that the quality of learning outcomes will be low. Therefore, the learning motivation in student needs to be strengthened continuously in order to make the students having strong learning motivation so that the learning outcomes can be achieved optimally.

According to the observations at MA Al Asror, some students still had low learning motivation. The students who have low motivation according to Ahmadi & Widodo (2004) seem indifferent, easily discouraged, their attention is not focused on the lesson, like to leave lesson, and it results in their learning difficulties. It appears in class X students at MA Al Asror. When the observation was conducted, it appears that most students are were in class even though the lesson bell had sounded, in the implementation of the learning it was seen that some students slept and talked to their friends, when they were given questions the students complained that the questions were difficult and some students worked on cheating, and quite a number of students did not work assignment from the teacher. Remedial measures to improve the student learning motivation so that the learning process can run well and can make students motivated to be involved in the learning process one of which is to implement ARCS learning.

Keller (1987) states that ARCS (Attention, Relevance, Confidence, Satisfaction) learning can generate low motivation and self-confidence of the students. ARCS learning has several advantages, as follows: a) can be applied in the learning of any subject area due to its flexibility, b) can increase students' interest and attention, increase self-confidence and provide a sense of satisfaction of the students in obtaining the learning outcomes, and c) in the learning activities can use any media to attract the students' interest (Wulandari, 2008).

ARCS learning emphasizes on how to arouse and maintain student's attention, create relevance to the content of learning, foster self-confidence in students, and foster a sense of satisfaction in students towards learning (Keller, 1987). The responsibility of the teacher is not just to transfer knowledge to the students, but how to prepare the learning situation that is not yet understood, being dare to express ideas and also give a reward to the students for their success and hard work in the learning activities, so it can increase the self-confidence of the students.

This study aims to find out the motivation and learning outcomes of class X MA Al Asror on ARCS learning in material of ecosystem.

RESEARCH METHOD

The study was conducted at MA Al Asror, which is located at Jalan Legoksari Raya 2, Patemon, Gunungpati, Semarang and carried out on the even semester of 2017/2018 school year. The sample of respondents in this study were students of class X IPA 1. The sampling technique was carried out by simple random sampling. The independent variable in this study is ARCS learning, while the dependent variable in this study is student learning motivation. This study intends to compare the student learning motivation per individual in non-ARCS learning and ARCS learning.

Table 1 Data, method and instrument for data collection

No	Data	Method	Instrument
1.	Learning motivation	- Motivational scale method	- Student learning motivation questionnaire
2.	Cognitive learning outcomes	- Test	- Cognitive test question in multiple-choice form
3.	Psychomotor learning outcomes	- Non-test	- Student assessment sheets
4.	Student performance	- Non-test	- Observation sheets on the performance of Attention and Confidence

RESULTS AND DISCUSSION

The implementation of the research begins with non-ARCS learning which was done by a conventional method that is commonly used in teaching and learning activities in the class. At the end of the learning, the students are given a questionnaire on learning motivation scale to measure the score of the students' learning motivation in non-ARCS learning.

After non-ARCS learning is carried out then the learning is carried out with the same method as before but it is integrated by the ARCS component. After the ARCS learning has been done, the students are given a questionnaire on learning motivation scale again to get a score of learning motivation in ARCS learning.

Based on the score of students' learning motivation, it is made a comparison between the categories of students' learning motivation in non-ARCS learning and ARCS learning through the following chart (the blue color indicates the percentage of students' learning motivation in non-ARCS learning category while the yellow one shows the percentage of students' motivation in ARCS learning category).

Figure 1 in the behind describe about score data of students' learning motivation in non-ARCS learning and ARCS learning are analyzed by dependent t-test. The result of the dependent t-test shows a significance level of $0.000 < 0.05$, it indicates that there is a relationship between ARCS learning with student learning motivation. Dependent t-test can also be used to determine ARCS learning contribution to the student learning motivation by knowing the value of r^2 , from the result of data analysis obtained the value of $r = 0.774$ so that $r^2 = 0.60$ (60%) it means that the contribution of ARCS to the student learning motivation is 60 %, the remaining 40% is determined by the other factors. The calculated t value in the dependent t-test is -16.665 with sig 0.000. The calculated t value is then consulted with the t table which is 2.035 (df = 32). It can be seen that t count > t table and sig < 0.05, it

means that H1 which states that there is a significant difference between learning motivation in non-ARCS learning and learning motivation in ARCS learning is accepted.

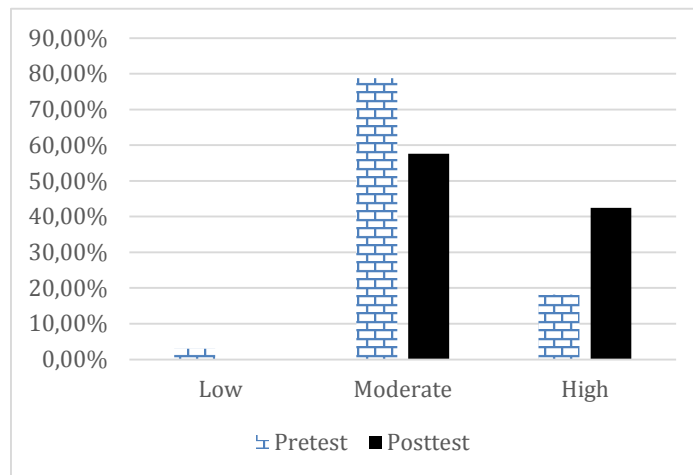


Figure 1 Comparison chart of students' learning motivation categories in non-ARCS and ARCS learning

The result of a paired t-test analysis shows that the score of students' learning motivation in ARCS learning is higher than students' learning motivation in non-ARCS learning. This optimal result occurs because each ARCS component is able to build and maintain the students' learning motivation. In line with Keller's statement (1987) which states that the element of attention is able to capture the interest of learning and stimulate the curiosity, the element of relevance can make the students find the learning objective so that it gives a positive impact on their behavior, the element of confidence helps the students believe that they will succeed and control their success, and the element of satisfaction can strengthen the achievement of the students with rewards. Chen (2009) reveals that reward is the simplest way to increase student learning motivation.

Uno in Novitasari *et al.* (2015) states that curiosity is the power to increase student learning motivation, this is in line with Chairani's (2005) statement which states that curiosity drives one's attention, in this case, attention is one of the components of ARCS. The teacher can use various audiovisual media to get students' attention (Liao & Wang, 2008), it is in line with the method applied in ARCS learning which is conducted in this study. To create relevance (Relevance), it is applied several steps that give comprehension to the students that the learning that is done is useful and related to their daily lives, it is in line with Khoiru's (2011) who says that students will be interested and motivated in learning if students feel that what is learned is useful for themselves. Further, the study proves that ARCS learning increases the students' confidence, it is indicated in the assessment of students' self-confidence performance that continues to increase each meeting. In line with this, Maidiyah (2013) reports that the aspect of student confidence in statistical learning is in the good and excellent category with ARCS learning, it is proven by the fact that the students not easily complaining and giving up when facing difficulties, the students focus on the learning objective and the students believe they can answer the questions given.

The score of learning motivation that has been tested t to determine the effect of ARCS learning on student learning motivation is, then it is carried out an N-gain test to determine the increase in learning motivation in non-ARCS learning and ARCS learning.

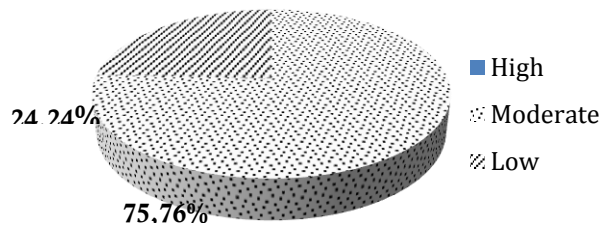


Figure 2 Percentage of the increase in student learning motivation frequency

The result of the N-gain test shows that all the students experience the increase of learning motivation. The average N-gain score is 0.39, which means that the average student learning motivation has a moderate increase, but if it is viewed per individual, there are 8 students who experience a low motivation increase. The students who experience a low motivation increase are the students with the codes S-02, S-03, S-05, S-09, S-15, S-16, S-21, and S-24.

S-02 student gets a moderate motivation score with the score of learning motivation is 46 and the percentage of 57.5% in non-ARCS learning, then the S-02 student motivation score increase to 56 with the percentage of 70% and still in the moderate category. According to the score of the learning motivation, the student only experiences an increase of 10 points, to get the moderate improvement category on the N-gain test, it must at least increase by 11 points if the category of the student motivation in ARCS learning is moderate. It also happens to S-05, S-09, S-15, S-16, S-21, and S-24.

S-03 student gets a motivation score of 39 with a low category in non-ARCS learning then increases to 50 in the moderate category. S-03 student experiences an increase of 11 points, when it is compared to the S-26 student, the two students are in the low category of learning motivation in non ARCS learning but S-26 student experiences an increase of 18 points. It can be seen that the increase in S-03 student motivation score is still less to get the moderate N-gain category. It also occurs to S-16 student.

The students who experience a low increase can be caused by the number of meetings for the learning process which is only three times face to face with two teaching and learning processes and the last meeting is for evaluation and presentation of the assignments. The relatively small number of meetings is thought to be the cause not all students experience a moderate increase and none of them have experienced a high increase.

Psychomotor cognitive learning outcomes are measured to get the final score and classical completeness in non-ARCS and ARCS learning. The final score on non-ARCS and ARCS learning is not to be compared because it is applied to the different material, but it is used to evaluate the feasibility of learning design.

The final score on non-ARCS learning is calculated from cognitive and psychomotor learning outcomes in material of animalia. The percentage of the final score criteria for non-ARCS learning can be seen in the following chart.

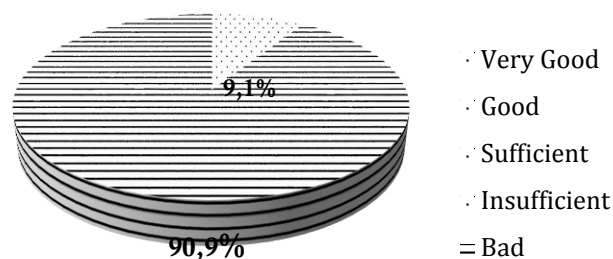


Figure 3 Percentage of the student final score criteria of non-ARCS learning

The final score on non-ARCS learning in material of animalia shows that there are no students who are on the criteria of sufficient, good, or very good. The result indicates that there are no students who complete on non-ARCS learning in material of animalia. Revisited by the score of the students' learning motivation on non-ARCS learning, it can be indicated that the students' final score which is still low is caused by their learning motivation which is relatively low. It is proven by the fact that there are many students who do not submit the assignment as their psychomotor assessment and for those who submit the assignment, there are a lot of them have not fulfilled the criteria yet. Characteristic of animalia material that has many contents and scientific names that are unfamiliar to students can also cause the students to get a relatively low final score, this is in line with Pinasthika's (2016) research which states that animalia is a complex learning material and students tend not to be interested and feel difficulty in material of animalia. Non ARCS learning (which uses the lecture method) should be re-evaluated and replaced with the learning design that can accommodate the students' needs.

ARCS learning which is carried out on material of ecosystem shows the classical completeness of 66.67%, from 33 students there are 22 students who complete and 11 students do not complete. The percentage of the students' final score criteria can be seen in the following chart.

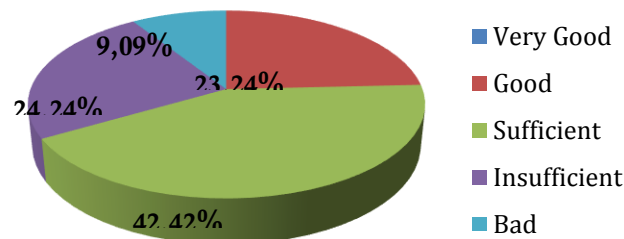


Figure 4 Percentage of the student final score criteria of ARCS learning

The acquisition of the students' final score is relatively good based on multiple correlation test result. It is influenced by the learning motivation and student performance with a contribution of 24.1% and 75.9%. It is also influenced by other factors. The role of motivation is seen in psychomotor learning outcomes. Psychomotor learning outcomes are measured by the task of creating a chart, in the implementation, all students collect the task to create a chart and the task is done according to the criteria conveyed by the teacher. Good psychomotor learning outcomes can contribute a quite high point to the final score. The result of this study is in line with the result of Ryan & Deci research in Wu & Lee (2017) which states that intrinsic and extrinsic motivation can stimulate individual behavior and performance. The intrinsic motivation will make the students continue to pursue the better performance based on their interests, while the extrinsic motivation is often driven by several rewards that the students can get at that time.

In ARCS learning although as many as 22 students have completed there are 11 students who have not completed yet. The incompleteness of psychomotor cognitive learning outcomes is mainly due to the low of cognitive value that is ≤ 65 . The students who are incomplete are the students with the code S-01, S-02, S-09, S-11, S-14, S-16, S-17, S-27, S-28, S-31, and S-33. The students who have not reached the limit are then re-analyzed. The students' final score is compared to the score of learning motivation, N-gain, and student performance. The comparison recapitulation is presented in the following table.

Table 2 Comparison of the final score, learning motivation score, N-gain, and performance score of the incomplete student

No.	Student Code	Final Score	Motivation post test score	N-gain	Performance Score
1	S-01	68	58 (moderate)	Moderate (0,44)	2,6
2	S-02	67	56 (moderate)	Moderate (0,29)	2
3	S-09	67	43 (moderate)	Moderate (0,15)	1,93
4	S-11	68	60 (moderate)	Moderate (0,49)	2,07
5	S-14	55	60 (moderate)	Moderate (0,37)	2,33
6	S-16	67	51 (moderate)	Low (0,27)	1,33
7	S-17	68	65 (high)	Moderate (0,37)	1,67
8	S-27	64	57 (moderate)	Moderate (0,32)	2
9	S-28	43	65 (high)	Moderate (0,35)	1,73
10	S-31	63	66 (high)	Moderate (0,52)	2,33
11	S-33	43	58 (moderate)	Moderate (0,33)	2,27

According to the table 7 above, it can be seen that 3 students (S-02, S-09, S-16) have a low motivation increase and 5 students (S-14, S-17, S-27, S-28, S-33) have a moderate motivation increase but with G values which are close to the low criteria range. The students' performance scores which are the implementation of ARCS learning that can be observed explicitly also tend to be low, that is ≤ 2.33 with a score range of 1-4. The analysis indicates that the motivation increase that tends to be low is thought to be caused by the students' learning motivation condition.

S-01, S-11, S-31 students have high or moderate that is close to high learning motivation post test score. The students' performance score also tends to be good, but if being seen from the students' final score it can be concluded that the condition of the students is not caused by the learning motivation but by the other factors, so it is necessary to conduct a more in-depth observation for these students. Although the final score of the students is quite good but due to the classical completeness is $\leq 85\%$ so the ARCS learning design must be evaluated and improved before being applied to the learning.

CONCLUSION

Based on the result of research and discussion, it can be concluded that students' learning motivation in ARCS learning is higher than students' learning motivation in non-ARCS learning seen from the differences in scores of individual learning motivation. The student learning outcomes in ARCS learning in material of ecosystem shows classical completeness of 66.67%.

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