

# Enhancing Learning Motivation and Self-Efficacy: Implementing the ARCS Flipped Classroom Strategy with Nearpod LMS

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## ABSTRACT

The COVID-19 pandemic has brought significant disruptions to education, leading to decreased student motivation and self-efficacy. In response, this study investigates the use of Nearpod, a Learning Management System (LMS), to improve achievement motivation and self-efficacy among Grade XII DPIB B students at SMK Negeri 2 Surakarta. This classroom action research was conducted in two cycles, employing the ARCS Flipped Classroom strategy integrated with Nearpod LMS. Data were collected through validated questionnaires measuring students' achievement motivation and self-efficacy across three phases: pre-action, Cycle I, and Cycle II. Findings revealed a consistent increase in both achievement motivation and self-efficacy. The average achievement motivation scores rose from 39.44 (pre-action) to 45.80 (Cycle I) and 48.36 (Cycle II). Similarly, self-efficacy scores improved from 40.67 (pre-action) to 45.08 (Cycle I) and 48.5 (Cycle II). These improvements indicate the effectiveness of Nearpod LMS in enhancing students' psychological engagement in learning. The implementation of Nearpod LMS, combined with ARCS and flipped classroom elements, significantly improved students' motivation and self-efficacy. The flexibility and interactivity offered by Nearpod support its continued use in post-pandemic education. This research underscores the potential of technology-based instructional strategies in classroom settings and provides a model for teachers to adapt digital tools to foster student engagement and confidence across various educational levels.

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## 1. INTRODUCTION

The COVID-19 pandemic has resulted in highly influential transformations in human life, one of which is in the world of education. The education sector in Indonesia is also facing extraordinary challenges. As a result of the pandemic, all educational activities around the world have been temporarily suspended or studied at home. Schools must organize distance learning. However, distance learning does not fully benefit students. Students experience many shortcomings, especially regarding their inadequate interaction with teachers. According to research Dayagbil et al. (2021), the shortcomings of distance

learning include limited internet access and minimal supervision in the learning process. Not a few students come from areas far from signal coverage. In line with that, research Nugroho and Sakhiyya (2022) states that other burdens are faced by parents who are forced to add to the budget for purchasing internet quotas. This change in the way of learning has forced many parties to follow a different path than before and the benefits for students are not yet clear. The education process during the pandemic is considered less effective due to many factors. One of them is the need for an Android-based cellphone that not all students have, especially those who are economically constrained. The findings Steinberg et al. (2024) suggest that the lack of mastery of technology is also a real impact experienced by parents. They have additional work to accompany their children in the learning process. In addition, according to Hipolito (2023), communication and socialization between students also decreased. This distance/online learning requires teachers to continue to pay attention to giving assignments and accompany them routinely via the WhatsApp application.

The pandemic has worsened the state of education, negatively affecting students' motivation to learn. Without direct supervision from teachers, many students become careless with their assignments. Some rely on their parents for help, while others resort to cheating or copying from the internet. This behavior reflects low motivation. Research supports this, showing that during online learning, students are often passive, uncreative, and unproductive (Ferrer et al., 2022). The shift to remote learning has also led many students to doubt their abilities. They often see academic demands as overwhelming, which further lowers their motivation. Although some try their best, a lack of self-confidence—known as self-efficacy—can make them feel incapable of achieving academic success (Fortuna et al., 2022). Other studies confirm that the pandemic has reduced students' self-efficacy, even causing stress (Billett et al., 2023). Low self-efficacy not only increases doubt but also heightens academic stress and negatively affects how students view and handle challenges (Lei et al., 2021; Aguilar, 2021).

This problem of low learning motivation and self-efficacy is also experienced by the students of Building Information Modelling or BIM (DPIB B) at State Vocational High School 2 Sragen and State Vocational High School 2 Surakarta. At State Vocational High School 2 Sragen, the problem was identified based on the Focus Group Discussion (FGD) on March 8 2023 at the Megaland Hotel Solo held by the Building Engineering Education Study Program of Sebelas Maret University involving DPIB State Vocational High School teachers from the former Surakarta residency, as proven by the documentation. Mrs. Ilmina, a teacher at State Vocational High School 2 Sragen, explained that the students became indifferent to their subjects, playing with gadgets while learning was taking place, and their creativity decreased.

At State Vocational High School 2 Surakarta students, the students' learning motivation and self-efficacy were found to be low, based on the initial observation on October 4, 2023, as proven by the documentation in the classroom and from the Head of the DPIB Skills Program who also doubled as a supervising teacher. The lessons regarding the learning motivation and self-efficacy of students majoring in DPIB showed some indicators of students lacking motivation and self-efficacy. It could be said that this low motivation to learn and self-efficacy occurred because students often played truant during class time, played with gadgets while being explained, paid no attention to the teacher, slept in class, and became chaotic during class time.

On this basis, initial measurements were carried out by distributing questionnaires and observing the learning motivation and self-efficacy of the students of grade XII of DPIB B at State Vocational High School 2 Surakarta. Of the 36 students, 7 had very low learning motivation, or 19.4%, 13 students had low learning motivation, or 36.1%, 7 students had high learning motivation, or 19.4%, and 9 students had very high learning motivation or 25%. In terms of the student self-efficacy, from the results of the questionnaire, 7 students had very low self-efficacy or 19.4%, 13 students had low self-efficacy or 36.1%, 9 students had high self-efficacy or 25%, and 7 students had very high self-efficacy or 19.4%. Based on the results of the FGD about students' low learning motivation and self-efficacy after the COVID-19 pandemic, teachers need immediate solutions with learning media that suit the problems experienced by the students to increase learning motivation and self-efficacy.

Motivation and self-efficacy are important in the learning process. Both topics have specific theories put forward by experts. Such as the motivation theory put forward by David McClelland (Abiola et al., 2023; McClelland, 1987). This theory contains individual behavior that is greatly influenced by three main needs that dominate a person. One of the human needs is the need for achievement, namely the need to achieve success as measured by the standards of perfection in a person. This need directs behavior towards efforts to achieve certain achievements.

In addition, there are other aspects that influence individual performance, namely self-efficacy. Bandura as a figure in this theory explains that self-efficacy is an individual's belief in acting (Bandura, 2012). Bandura states that self-efficacy increases a person's chances of success and self-efficacy will affect a person's ability to overcome challenges or obstacles to achieve success (Bandura, 1978). According to McClelland, the three needs also show a significant correlation between motivation and self-efficacy (McClelland, 1978). Collins' research shows that self-efficacy is correlated with effort and persistence in learning (Collins et al., 2021). Students with high efficacy will not give up easily when facing difficulties in learning. This shows that there is a factor of desire or motivation for students to compete.

The importance of self-efficacy and student motivation needs to be taken seriously. Both are challenges that must be faced during the pandemic. Efforts that can be made are by using Nearpod LMS learning media. Nearpod LMS is a web-based learning facility that has interesting features to support interactive classroom learning. Nearpod LMS can be accessed for free by students and teachers and has no time limitations (Nurhamidah, 2021). However, to further increase the learning motivation and self-efficacy in the students of DPIB SMK, the Nearpod LMS must be balanced with appropriate learning strategies, such as using the ARCS Flipped Classroom strategy.

The ARCS strategy is a learning approach that focuses on students' extrinsic motivation to make subjects more active in learning and encourages the emergence of students' intrinsic motivation as a guide to developing effective systems and motivation (Schneider et al., 2018). According to Sahanata and Dewi, (2022), the implementation of ARCS utilizes information and communication technology supported by four basic aspects, namely attention, relevance, confidence, and satisfaction. This strategy is very important to use in distance learning because it can expand the appeal of learning and its consequences from the educational experience (Jamil, 2019). The ARCS strategy has also proven effective in optimizing student participation and learning motivation (Li & Keller, 2018a). The combination of ARCS with flipped classrooms is a perfect combination.

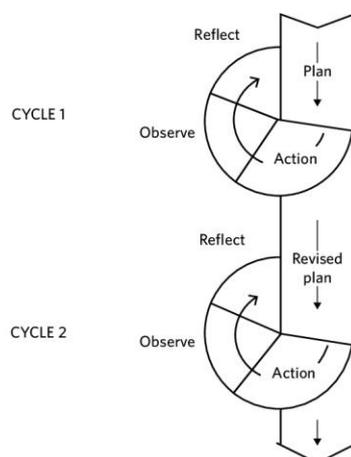
The flipped classroom strategy gives teachers the opportunity to return the learning process to students' learning needs and readiness, and increase their interaction in teaching (Jhonson, 2015; Usmadi & Ergusni, 2019). On the other hand, flipped classroom a learning activity that specifically seeks learning with procedures that are usually carried out in class (Bergmann & Sams, 2012; Bhakti et al., 2020). The two strategies are modified in the form of game media. Nearpod as one of the educational games that can be applied. The advantage of Nearpod is the results obtained in real time or at the same time. This will make it easier for teachers to discuss the value of games played by students (Sanmugam et al., 2019).

Based on McClelland's Achievement Motivation Theory and Albert Bandura's Self-Efficacy Theory, it is considered appropriate to implement Nearpod LMS media with the ARCS Flipped Classroom strategy in learning. The advantages of this media are that it is a way to optimize student motivation and self-efficacy. This media is a bridge for teachers to continue to carry out learning during the pandemic smoothly. Furthermore, teachers at the high school level rarely use this media. This research is an opportunity to fill the gaps that occur in learning during the pandemic. Thus, this research aims to improve learning motivation and self-efficacy of students in the Building Information Modeling (DPIB) course at State Vocational High School 2 Surakarta through the ARCS Flipped Classroom strategy.

## 2. METHODS

The research was carried out at State Vocational High School 2 Surakarta, Banjarsari District, Surakarta City. The subjects of this research were 36 students in Grade XII of DPIB B State Vocational High School 2 Surakarta in the 2023/2024 academic year, consisting of 10 female students and 26 male

students. The data sources in this research were the teachers, students, and activity documents. The research approach was Classroom Action Research (CAR) which was carried out in two cycles with the research procedures starting from planning, implementation, and observation, until reflection (Arikunto et al., 2015). The type of CAR research was proposed by Kemmis. The stages follow the pattern as in Figure 1.



**Figure 1.** Classroom Action Research Model According to Kemmis and Taggart Spiral (Kemmis & McTaggart, 1988)

Figure 1 shows four stages in the CAR research. First, planning is carried out with various activities, such as: 1) obtaining permission from the school (State Vocational High School 2 Surakarta), creating learning scenarios (learning achievements to required attachments), preparing learning materials, creating research instruments (observations and questionnaires), and designing evaluation tools. Second, the implementation of Action or acting is carried out by taking action according to plan and organizing the process in such a way. Implementation is implemented by using Nearpod LMS media with the ARCS Flipped Classroom strategy. Third, observations are made by other people as observers during the research. Actions taken by students and teachers are observed and measured with observation sheets. Fourth, reflection is carried out by reflecting on the activities that have been carried out by teachers and students. This process also involves observers to provide suggestions and input to researchers as material for improvement at the next meeting.

The data used in this research was qualitative in the form of observation sheets and questionnaires. The data collection technique in the research was non-test. The non-test data collection technique in this research consisted of two data, including a questionnaire and observation. The instruments used were questionnaires and observations. The questionnaires contained statements consisting of 17 statement items. The questionnaires contained questions about students' motivation and self-efficacy. The questionnaires were compiled using a Likert scale and consisted of four answers, namely very appropriate, appropriate, inappropriate, and very inappropriate. The questionnaire items consisted of two groups, namely favorable and unfavorable. Completeness regarding motivation indicators is shown in Table 1.

**Table 1.** Motivational questionnaire grid

Indicator	Descriptor	Item	
		Fav	Unfav
Decision in choosing	Able to choose to be involved in academic tasks rather than non-academic tasks	1,2	
	Choosing efforts to develop self-competence	3	4
Love the Competition	Desire to achieve	5	6
	Quality of results	7,8	
Showcasing business	Demonstrates higher physical activity	9	10,11
	Persistent in completing work	12,13	
Responsible	Be personally responsible	14	15
	Concentrate on the task	16	17

The self-efficacy questionnaire instrument contains three dimensions, namely strength, generality, and level. This instrument is arranged in the form of a statement sentence. Completeness regarding the dimensions of self-efficacy is presented in Table 2.

**Table 2.** Self-efficacy questionnaire grid

Dimension	Descriptor	Item	
		Fav	Unfav
Level	Individuals are confident in their ability to overcome difficult tasks.	1	2
	Individuals perform tasks according to their abilities	3,4	
	Individuals who never give up in the face of difficulties	5	6
Strength	Individuals work optimally	7	8
	Individuals can face obstacles in achieving goals	9	10
	Individuals are optimistic about carrying out tasks	11	12
Generality	Individuals can complete all work at the same time	13,14	
	Individuals work on tasks in different areas	15	

The observation sheet contains a statement sentence regarding the learning process by implementing Nearpod LMS (ARCS Flipped Classroom strategy). This process was carried out during the research, precisely when the learning was carried out. Observations capture the learning process as it is, both during group and individual activities. The observation sheet is also processed from the scores obtained. The scoring is based on the weight of each indicator. The measurement scale on the observation sheet is a Likert scale with four answer intervals (strongly agree, agree, disagree, and strongly disagree) (Mumu et al., 2022).

In this study, content validity was carried out to test the instrument through corrections from expert opinions. The instrument that has been constructed is adjusted to the aspects to be measured, namely learning motivation and self-efficacy. The validity test in this research used an instrument from Dwi Pramono with the thesis entitled "The Relationship between Achievement Motivation and Self-Efficacy and Learning Awareness of Class X Students at SMK Bhineka Karya Surakarta" and had been tested for validity (Pramono, 2022). Pramono's research has validated the expert and decided on the

instrument created. There are two experts with appropriate educational qualifications who check Pramono's research instrument.

The results of the validity test from Pramono's thesis show that 34 items are worthy of being tested for construct validity. These items consist of 17 motivation items and 17 self-efficacy items. After being checked by an expert, Pramono also calculated using the Aiken's V formula. The results of the Aiken's V test show that 17 motivation items have very high criteria, with an average score of 0.92. Meanwhile, 17 self-efficacy items also obtained very high criteria with a score of 0.92. In general, the 34 items (motivation and self-efficacy) were declared valid constructs after being tested using SPSS 23.

The instrument reliability results also showed good results and were adopted from Pramono's research. Reliability is an index that shows a reliable measuring instrument (Ahmed & Ishtiaq, 2021). The reliability test of this study used the Cronbach Alpha criteria with the help of SPSS 23. The results of the achievement motivation reliability test scored 0.898 or were categorized as very reliable. The results of the self-efficacy reliability scored 0.875 with a very reliable category.

The data analysis technique in this research was descriptive statistical data analysis. This analysis presents data in a more structured way. This study presents data in the form of a frequency distribution table and numeric presentation (minimum value, maximum value, average value, mode, and media) (Heavey, 2022). The forms used are descriptions, graphs, and tables. The presentation of the data is interpreted to obtain a conclusion. In the calculations, the researcher used the Microsoft Excel application to facilitate data processing. The research results obtained were first checked by the resource person for approval from the participants and as a form of ethical consideration of the research.

### 3. FINDINGS AND DISCUSSION

#### 3.1 Pre-Action Data

The results of the research that has been conducted it will produce student answers which will then be calculated with the average number. In the next step, the researcher interprets the results of the student's answers.

**Table 1.** Pre-Action Descriptive Statistics

Descriptive Statistics of the Pre-Action Achievement Motivation						
Total	Min	Max	Sum	Mean	Median	Mode
36	21	66	1420	39.4444	38	38
Descriptive Statistics of Pre-Action Student Self-Efficacy						
36	22	59	1464	40.6667	39.5	36

This learning motivation data was obtained based on the student psychology scale observed and distributed to 36 students with 17 question items, while self-efficacy data was obtained based on the student psychology scale observed and distributed through 15 question items. Based on the pre-action data, achievement motivation data showed an average value of 38, a minimum value of 21, a maximum value of 66, and a middle value of 38. Meanwhile, in the pre-action self-efficacy data, the average value was 40.67, a minimum value of 22, a maximum value of 59, and a middle value of 39.5.

**Table 2.** Results of the pre-action achievement motivation and self-efficacy categories

Category	Results of the Pre-Action Achievement Motivation Categories			Results of Pre-Action Self Efficacy Categories		
	Frequency (F)	Percent (%)	Cumulative Percent (%)	Frequency (F)	Percent (%)	Cumulative Percent (%)
Very low	7	19.4	19.4	7	19.4	19.4
Low	13	36.1	55.6	13	36.1	55.6
High	7	19.4	75.0	9	25	80.6
Very High	9	25	100.0	7	19.4	100.0
Total	36	100		36	100	

Table 2 contains the results of the achievement motivation category before the action is grouped into four categories. The very high category obtained a frequency of 9 and a percentage of 25%. The high category obtained a frequency of 7 and a percentage of 19.4%. The low category obtained a frequency of 13 and a percentage of 36.1%. The very low category obtained a frequency of 7 and a percentage of 19.4%. The Self-Efficacy results have the same value in the very low and low categories. However, the high and very high-value categories have opposite results. The high category obtained 9 frequencies with a percentage of 25%, and the very high category obtained a percentage of 19.4% with a frequency of 7.

**Table 3.** Pre-Action Achievement Motivation Observation Results

No	Indicator	Total	Percentage
1	Making the Decision to choose	88	48.89%
2	Loving Competition	90	50.00%
3	Showcasing Business	96	53.33%
4	Being Responsible	93	51.67%

Table 3 contains the results of the observation of achievement motivation before the action. The motivation applied in this study includes four indicators. The first indicator, related to making a decision to choose, obtained a total of 88 with a percentage of 48.89%. The second indicator, related to making a loving competition, obtained a total of 90 with a percentage of 50%. The third indicator, related to displaying a business, obtained a total of 96 with a percentage of 51.67%. The fourth indicator, related to responsibility, obtained a total of 93, with a percentage of 51.67%.

**Table 4.** Pre-Action Self-Efficacy Observation Results

No	Indicator	Total	Percentage
1	Level	113	62.78%
2	Strength	95	52.78%
3	Generality	103	57.22%

Table 4 contains the results of self-efficacy observations before the action. Self-efficacy applied in this study includes three indicators. The first indicator level was obtained at 113, with a percentage of 62.78%. The second indicator related to strength was obtained at 95, with a percentage of 52.78%. The third indicator related to generality was obtained at 103, with a percentage of 57.22%.

### 3.2 Cycle I and II

**Table 5.** Descriptive Statistics of the Achievement Motivation in Cycle I and II

Descriptive Statistics of the Achievement Motivation in Cycle I Data						
Total	Min	Max	Sum	Mean	Median	Mode
36	25	69	1649	45.8056	42	42
Descriptive Statistics of the Achievement Motivation in Cycle II Data						
36	30	68	1741	48.3611	4.5	40

The descriptive statistical results of achievement motivation obtained from 17 question items in cycle I obtained an average of 45.80 with a minimum value of 25 and a maximum value of 69. In cycle II, the average was 48.36 with a minimum value of 30 and a maximum of 68. This shows that there was an increase in the average achievement motivation with a difference of 2.56.

**Table 6.** Results of Achievement Motivation Categories in Cycle I and II

Category	Results of Achievement Motivation Categories in Cycle I			Results of Achievement Motivation Categories in Cycle II		
	Frequency (F)	Percent (%)	Cumulative Percent (%)	Frequency (F)	Percent (%)	Cumulative Percent (%)
Very Low	4	11.1	11.1	2	5.6	5.6
Low	7	19.4	30.6	5	13.9	19.4
High	10	27.8	58.3	8	22.2	41.7
Very High	15	41.7	100	21	58.3	100
Total	36	100		36	100	

The results of achievement motivation in cycles I and II are grouped into 4 parts. In the first category, which is very low in cycle I, it gets a frequency of 4 with a percentage of 11.1%, while in cycle II it gets a frequency of 2 with a percentage of 5.5%. In the second category, which is low in cycle I, it gets a frequency of 7 with a percentage of 19.4%, while in cycle II it gets a frequency of 5 with a percentage of 13.9%. In the third category, which is high in cycle I, it gets a frequency of 10 with a percentage of 27.8%, while in cycle II it gets a frequency of 8 with a percentage of 22.2%. In the fourth category, which is very high in cycle I, it gets a frequency of 15 with a percentage of 41.7%, while in cycle II it gets a frequency of 21 with a percentage of 58.3%. This shows that there is an increase in student motivation from cycle I to II, as shown by the frequency of the very high category and a decrease in the low and very low categories.

**Table 7.** Observation Results of Achievement Motivation in Cycle I and II

No	Indicator	Cycle I		Cycle II	
		Total	Percentage	Total	Percentage
1	Making Decision to choose	103	57.22%	138	76.67%
2	Loving Competition	94	52.22%	137	76.11%
3	Showcasing Business	120	66.67%	136	75.56%
4	Being Responsible	102	56.67%	137	76.11%

Table 7 contains the results of observations of achievement motivation after the action. The first indicator, related to making a decision to choose in cycle I obtained a total of 103 with a percentage of 57.22%, while in cycle II obtained 138 with a percentage of 76.67%. The second indicator, related to making a loving competition in cycle I obtained a total of 94 with a percentage of 52.22%, while in cycle II obtained 137 with a percentage of 76.11%. The third indicator, related to displaying a business in cycle I obtained a total of 120 with a percentage of 66.67%, while in cycle II obtained 136 with a

percentage of 75.56%. The fourth indicator, related to responsibility in cycle I, obtained a total of 102 with a percentage of 56.67%, while in cycle II, it obtained 137 with a percentage of 76.11%. The data in cycles I and II shows an increase in student achievement motivation, which is marked by each indicator with an increasing number.

**Table 8.** Descriptive Statistics of Self-Efficacy in Cycle I and II

Descriptive Statistics of Self-Efficacy in Cycle I						
Total	Min	Max	Sum	Mean	Median	Mode
36	24	67	1623	45.0833	45	45
Descriptive Statistics of Self-Efficacy in Cycle II						
36	32	68	1768	49.1111	48.5	45

The results of descriptive statistics of self-efficacy obtained from 15 question items in cycle I obtained an average of 45.08 with a minimum value of 24 and a maximum value of 67. In cycle II, the average was 49.11, with a minimum value of 32 and a maximum of 68. This shows that there was an increase in the average achievement motivation with a difference of 4.03.

**Table 9.** Results of Self-Efficacy Categories in Cycle I and II

Category	Cycle I			Cycle II		
	Frequency (F)	Percent (%)	Cumulative Percent (%)	Frequency (F)	Percent (%)	Cumulative Percent (%)
Very low	6	16.7	16.7	3	8.3	8.3
Low	8	22.2	38.9	5	13.9	22.2
High	10	27.8	66.7	10	27.8	50
Very High	12	33.3	100	18	50	100
Total	36	100		36	100	

The results of self-efficacy in cycle I and II are grouped into 4 parts. In the first category, which is very low in cycle I, it gets a frequency of 6 with a percentage of 16.7%, while in cycle II it gets a frequency of 3 with a percentage of 8.3%. In the second category, which is low in cycle I, it gets a frequency of 8 with a percentage of 22.2%, while in cycle II it gets a frequency of 5 with a percentage of 13.9%. In the third category, which is high in cycle I, it gets a frequency of 10 with a percentage of 27.8%, while in cycle II it gets a frequency of 10 with a percentage of 27.8%. In the fourth category, which is very high in cycle I, it gets a frequency of 12 with a percentage of 33.33%, while in cycle II it gets a frequency of 18 with a percentage of 50%. This shows that there is an increase in self-efficacy from cycle I to II as shown by the results of the frequency of the very high category and a decrease in the low and very low categories.

**Table 10.** Results of Self-Efficacy Observations in Cycle I and II

No	Indicator	Cycle 1		Cycle 2	
		Total	Percentage	Total	Percentage
1	Level	118	65.56%	137	76.11%
2	Strength	100	55.56%	136	75.56%
3	Generality	95	52.78%	138	76.67%

Table 10 contains the results of self-efficacy observations after the action. The first indicator, related to the level in cycle I obtained a total of 118 with a percentage of 65.56%, while in cycle II obtained 137 with a percentage of 76.11%. The second indicator, related to strength in cycle I obtained a total of 100 with a percentage of 55.56%, while in cycle II obtained 136 with a percentage of 75.56%. The third

indicator, related to generality in cycle I obtained a total of 95 with a percentage of 52.78%, while in cycle II, obtained 138 with a percentage of 76.67%. Data from cycles I and II show an increase in student self-efficacy, which is marked by each indicator with an increasing number.

### *Discussion*

Based on the results of the research that has been conducted, the observation data of achievement motivation and self-efficacy in learning using LMS Nearpod consisting of pre-class, interactive presentation, discussion, quiz, and feedback evaluation. This pre-class stage uses LMS Nearpod dissertation ARCS Flipped Classroom strategy. The teacher provides material before learning through LMS Nearpod by sharing the class code with students. The ARCS Flipped Classroom strategy emphasizes the use of effective teaching techniques, communication, and relationships in web-based and face-to-face classes (Karabatak & Polat, 2020).

The learning facilities provided by the Nearpod application can make students more familiar with various features in the form of video links, teaching materials displayed in the form of files that can be downloaded on laptops and cellphones. Likewise, they can interact with websites and attendance via google doc, and other evaluation questions that are done bravely (Edmodo, Moodle, Google class, etc.). Some of these interactive features can be added to the Nearpod software and materials can be broadcast to internet student devices. Through the application of Nearpod software and presentation design using Nearpod can support student learning.

Nearpod makes students more active and teachers are more flexible to monitor the progress of each student. Students are very satisfied with learning using the Nearpod application and their learning is more integrated and focused. Students can access the Nearpod application with any device and interact during learning through this application. One of the main reasons Nearpod is preferred is its interactivity and interactive board that is easily accessible to every student (Delacruz, 2014; Sivarajah et al., 2019). In line with the opinion of (Ami, 2021) that the use of the Nearpod application is highly recommended for teachers, because it has many innovative and educational features to create interactive learning, can be accessed for free, and is easily accessed using mobile phones by students. The Nearpod application has also been reported to improve organization in presentations, ensuring technology works well for teaching, planning, and proper consideration must be made (Sivarajah et al., 2019).

However, although Nearpod has many advantages, the implementation of this media also has several challenges, especially due to the different socio-economic backgrounds of students and the fact that some students are not fully literate in technology. The use of internet data is quite wasteful because this media displays video features, images, and other things that drain a lot of internet data. The same thing was expressed (Suryaningsih & Rahim, 2019) there are several challenges in implementing Nearpod including limited devices, internet connectivity, and lack of training for teachers in using Nearpod optimally.

However, some of these challenges are not comparable to the sophistication of the Nearpod learning media containing creative and educational features that can realize interactive learning for students. The application on Nearpod provides various features to combine presentation documents, examples of Virtual Reality (VR) displays, insert PDFs, and others (Ami, 2021; Susanto, 2021). In the Nearpod activity feature, this application is equipped with interactive quizzes, entering questions for long answers, memory tests, filling in the dots, and answering questions with pictures (Minalti & Erita, 2021; Permana & Nourmavita, 2017). Based on the analysis conducted by Feri and Zulherman, the Nearpod learning media is a media that is needed and supports activities in learning (Feri & Zulherman, 2021). In line with the opinion of (Himmah & Yaqin, 2023) that Nearpod media is very effective and efficient for use by teachers as a technology-based learning media. In Nearpod-based learning, students have different interests and learning interests.

In the literature, there are studies showing that ARCS motivation has been successfully implemented in face-to-face teaching (Asiksoy & Özdamlı, 2016; Bueno-Alastuey & Andrés Galar, 2017;

Kong, 2014; Schultz et al., 2014) with technology supported online and distance learning ((Li & Moore, 2018; Malik, 2014) and web-supported teaching (Turel & Ozer Sanal, 2018). The same thing was expressed (Gencer et al., 2014) which stated that research on the integration of distance education systems into flipped classroom systems should be increased, because this situation can provide important benefits for student learning. However, although Nearpod has many advantages, the implementation of this media also has challenges, especially in schools that are not yet fully technology literate. Some of these challenges include limited devices, internet connectivity, and lack of training for teachers in using Nearpod optimally (Suryaningsih & Rahim, 2019).

Research by (Efe et al., 2022; Kurt & Keçik, 2017), the level of academic achievement of the experimental group using ARCS motivation in a web-based environment was higher than the control group in a face-to-face classroom environment. (Li & Keller, 2018b), it was stated that the ARCS model is applied in various learning contexts at the international level. Several studies have observed that the flipped classroom approach improves participants' academic abilities or performance (Asiksoy & Özdamlı, 2016; Deslauriers, 2011; Kong, 2014; Schultz et al., 2014; Turel & Ozer Sanal, 2018). Findings Most of the studies related to the ARCS motivation model and the flipped classroom approach and the findings of these studies are in line with each other.

Learning in cycles I and II used the Nearpod LMS dissertation ARCS Flipped Classroom strategy. The results of the study before and after the action using the Nearpod LMS dissertation ARCS Flipped Classroom strategy carried out in two cycles experienced a significant increase in measuring achievement motivation and self-efficacy. The results of the descriptive statistics of achievement motivation obtained an average of 45.80 in cycle I and increased in Cycle II to 48.36. The results of the achievement motivation grouping in Table 6 show a significant increase which is marked by an increase in frequency in the very high category and a decrease in the low and very low categories. Research supports the results of this study which reveal that students who have high motivation have characteristics including: being diligent in facing tasks, being persistent in facing difficulties, showing interest in various problems, preferring to work independently, getting bored quickly with routine tasks, being able to defend their opinions, not easily letting go of what they believe in, and enjoying finding and solving problems (Amir, 2020).

One of the most significant problems in the distance education system is learner motivation (Gökçe & Hakan, 2015; Karabatak & Polat, 2020). The face-to-face training process cannot provide sufficient motivation for students, and motivational strategies are important when deciding on the materials to be used or developing materials to motivate students in the teaching process. Achievement motivation is divided into four indicators which include making decisions, making loving competitions, showing business, and responsibility. This also shows the difference in achievement motivation before and after action in each indicator of achievement motivation.

The characteristics of people who have high achievement motivation are manifested in responsible behavior, considering risks, paying attention to comments, and creativity (Hartati et al., 2021). The results of the study (Wigfield et al., 2021) show that achievement motivation is the key to student success. In line with the opinion of Mc Clelland (Mc, Clelland, David, 1996), which states that achievement motivation is basically present in everyone to take action to get the best results. Students who have high motivation can be shown by behavior that tends to be able to motivate themselves in a better direction, and maintaining it is greatly influenced by factors both from within themselves and by their social environment.

Students begin to show their confidence in being able to solve the problems they currently face effectively, starting from completing all assignments, how to overcome a difficult thing, and seeing a problem as a challenge that must be solved in a good way, setting the final goal along with being responsible for all commitments taken, focusing on taking precautions to avoid problems, and being able to face a threat by controlling that they can control it. This is also felt by teachers in teaching which is marked by a strong drive so that students are able to complete academic tasks without depending on others. These factors are the main drivers because they create motivation to achieve and their work

results continue to increase. Self-efficacy plays an important role in building motivation, managing time independently, and the ability to complete learning tasks (Sibarani et al., 2025).

Student self-efficacy is a prerequisite for students to increase achievement motivation, which is very significant in influencing student achievement motivation. The reason is, achievement motivation as a driving force in students to achieve the highest achievement, is further strengthened by student self-efficacy. Students who always show the best achievement are students who have achievement motivation and self-efficacy that influences it. Students who have achievement motivation will always try hard to achieve the goals set. With high self-efficacy, students will increase achievement motivation to the maximum. The same thing was expressed (Shin, 2018): students with a strong sense of self-efficacy will accept challenging tasks, increase interest in tasks, and recover quickly from any disappointments. Learning motivation and self-efficacy have a close relationship with each other as shown in previous research (Lee, J. W. & Choi, 2015). The higher the learning motivation, the higher the self-efficacy.

Self-efficacy in this study was revealed based on three dimensions described by Bandura. The three dimensions of self-efficacy are (1) magnitude, (2) generality, and (3) strength (Albert, 2001; Street et al., 2017). Magnitude is the level of a person's confidence in making an effort or action. Strength is the level of a person's confidence in achieving good performance. Generality is the use of flexibility in the form of a person's self-efficacy in different situations. The higher a person's self-efficacy describes the level of his or her adjustment to the situation (Benawa, 2017).

The results of this study showed a significant increase in cycles I and II in students' achievement motivation and self-efficacy using the Nearpod LMS dissertation ARCS Flipped Classroom strategy. Students who have self-efficacy participate more easily, work harder, persist longer, and have fewer adverse emotional reactions when faced with difficulties than those who doubt their abilities (Bandura, 1997). High self-efficacy will make students more confident in having efforts to achieve good learning outcomes (Van Dinther et al., 2011). Self-confidence and self-belief will also encourage students to make maximum efforts in achieving their goals in learning, and be able to put aside things that can interfere with learning activities. In addition, students who have self-efficacy know their weaknesses and strengths well, so they will determine the right strategy to achieve optimal results.

Several previous studies have also developed Nearpod media. Research conducted by ((Susanto, 2021) which applied Nearpod e-media through the discovery learning model obtained an N-gain of 0.42 so it is said to be effective in improving students' thinking skills. Another study conducted by (Minalti & Erita, 2021) which showed that the Nearpod application can be used as a teaching material for thematic learning in grade IV elementary schools. In addition, research obtained results that Indonesian language learning runs optimally using Nearpod application-based learning media (Ami, 2021).

The existence of strong enough self-efficacy will help students to achieve high learning motivation so that students can achieve their desired goals and can complete their tasks well in achieving learning achievements at school. From these findings, it can be said that there was a significant increase after the actions in cycles I and II in the achievement motivation and self-efficacy of students who used the Nearpod LMS dissertation ARCS Flipped Classroom strategy.

#### 4. CONCLUSION

The use of the LMS dissertation ARCS Flipped Classroom strategy can increase achievement motivation and self-efficacy. The results of the increase related to achievement motivation obtained an average of pre-action (39.44), cycle I (45.80), and cycle II (48.36). While the results of the increase related to self-efficacy obtained an average of pre-action (40.67), cycle I (45.08), and cycle II (48.5). This media is not only effective in facilitating conceptual understanding through an interactive approach, but also increases student involvement in the learning process. Nearpod can be an alternative technology-based learning media that is effectively applied in different class levels and in other learning, such as IPAS (Natural and Social Sciences), Indonesian, and mathematics. Through this research, it is expected to

open teachers' minds so that they do not always use conventional media and start utilizing and maximizing the role of technology as a means for students to learn. Suggestions for further research can test whether these findings apply to different school environments, both in rural and urban areas and in different subjects.

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