

The Effectiveness of the Implementation of the Flipped Classroom Learning Strategy on Motivation, Discipline and Learning Results

Darmansyah
Instructional Technology Study Program, Faculty of Education,
State University of Padang, West Sumarta, Indonesia

Abstract: This study examined the effectiveness of the flipped classroom learning strategy on student's motivation, discipline and learning results on the classroom action research subject. The research subject consists of 66 students grouped into experimental and control groups which were taught separately by using the flipped classroom learning strategy and a conventional discussion strategy. Flipped classroom learning strategy with technology has a significant positive effect on student's motivation, discipline and learning results. It can be concluded that the experimental group of students taught by flipped classroom strategy is better than the control group in all three domains.

Key words: Flipped classroom, motivation, discipline, domains, classroom, strategy

INTRODUCTION

Classroom Action Research (CAR) is a course that has distinctive characteristics by integrating cognitive, affective and psychomotor abilities simultaneously in the learning process (Darmansyah, 2011). It is aimed not only at understanding and mastering the theories and cognitive concepts but also having the skills to produce proposals, conducting research and making research report. Students are expected to reach the optimum competence in all three cognitive, affective and psychomotor integratedly in the form of learning results followed by proposals and research reports.

CAR competency mastery is not only to get the best mark at the end of the semester for students but also to develop professional career after college completion as teachers. The government requires the teachers to perform the CAR as a condition of promotion at any level/rank (Regulation of Indonesian Minister of State Apparatus Utilization and Bureaucratic Reform Number 16 in 2009). In Article 17 of this regulation it is stated that the teachers from the rank of IIIB upwards who will be promoted are required to write scientific papers at least 4 credit numbers of the elements of scientific work publication and/or innovative works. The most appropriate way for this purpose is to conduct the classroom action research (Darmansyah, 2011).

The learning results of this subject for the last 5 years are still not satisfactory. Only 65% of students are able to meet the defined minimum learning results (Darmansyah, 2016). The low learning achievement has not only results in low semester grades, students are also suffered from

the weak mastery of one of the pedagogical competence components as a teacher in the future. Most teachers in Indonesia have failed to achieve the rank of IV/a upwards due to the low competency level of writing scientific papers originating from the research results, especially the CAR. The lack of the CAR competency mastery has an impact in the career development of teachers themselves. At the same time, it means teachers have low professionalism level in performing their duties. At least 344 thousands of the 2.7 million government school teachers in Indonesia are already in the rank of IV/A. However, only about 2,200 of them can rise to the rank of IV/B upwards. The rest are stacked at the rank of IV/A since they are not able to write scientific papers.

The integration of learning results within the three domains requires a high commitment in the learning process by both lecturers and students. Lecturers need to set up learning strategies and the appropriate evaluation so that the quality of the process and learning results are getting better and better. Student's learning motivation must remain high so that, they can face many learning obstacles from inside and outside the classroom. Discipline becomes important for students to complete tasks already programmed in each week, so that late submissions will be decreased. The learning strategy must have characteristics that can serve the needs of students and assist in increasing student's motivation and learning discipline. The increased learning motivation and discipline will have a direct impact on the improvement of student's learning results.

Based on the characteristics of flipped classroom learning strategy, it is possible to improve student's 3

motivation, discipline and better learning results better and better. Stated that the flipped classroom learning strategy can increase both intrinsic and extrinsic motivation. The material in the forms of concepts and theories must be mastered prior to writing research proposals, research implementation and research reports (Darmansyah, 2011). The competency procurement requires knowledge, attitudes and skills in optimal condition. These achievements can be done if students have the motivation and discipline in completing the tasks assigned by lecturers. Flipped classroom learning strategy has efficacy to provide motivation and discipline to improve learning results. Stated that motivation is a change in one's personal energy characterized by the emergence of an effectivity and reaction to achieve learning goals that spur him to achieve it.

Flipped classroom learning strategy is a strategy that flips learning practices between the delivery of content via the media outside the classroom and in depth discussions in the classroom. In its practice there are more things in the flipped classroom after the initial questions are answered; the students were then given the task for the day, investigation activities, directed problem solving activities or tests as feedbacks (Bergman and Sams, 2009).

Students prepare class meetings only to receive less information and discussion after that they discuss do exercises and focus on talking about material that has been given the previous week. Flipped classroom learning strategy provides opportunities for the lecturers to interact more deeply with the students in the classroom to provide solutions to the student's learning problems. Tucker in Amy Roehl *et al.* (2013) states that the flipped classroom learning strategy enables students to take advantage of the time in the classroom to solve the problems, develop learning concepts and engage in collaborative learning.

Flipped classroom learning strategy has been introduced by several researchers and teachers since, 2000 informs that the flipped classroom learning strategy is a revolutionary teacher's attempt to produce an effective classroom for learners. The practice of the flipped classroom learning strategy was initiated by Bergmann and Sams (2009) two Chemistry teachers in Connecticut United States since, 2007 (Bergman and Sams, 2009). They both used the software to record a PowerPoint presentation to help students who could not join the class because of illness. Then, their step was followed by Salman Khan in 2011 who took the initiative to develop a short video in Mathematics. In this case,

students were required to watch a video a week prior to the learning class conducted. Teachers were given the freedom to focus on classroom discussions, doing exercises and helping students facing learning difficulties. Some studies show better learning results in applying the Flipped Classroom Learning Strateg. Surveys of 400 teachers using Sophia Online Social Education Platform (www.sophia.org) shows that by using the flipped classroom method, 85% of them expressed their satisfaction that the method has successfully increased their student's learning results. Subsequent research conducted at nanyang girls high school, on the subjects of Mathematics for 6 weeks with the participation of 405 students, lead to the conclusion that there are differences in learning results between the experimental group (0.79 ± 0.05) and the control group (0.6 ± 0.12).

This study has different characteristics from several previous ones. The previous study conducted on high school education down while this research is done in universities. Learning results being targeted in previous studies are more on the cognitive domain. On the contrary this study focuses on the effectiveness of the flipped classroom learning strategy in terms of motivation and discipline. The achievement of learning results measured in the study is seen collectively within three cognitive, affective and psychomotor domains.

In Indonesia, there are few researches on the influence of flipped classroom learning strategy in the learning process. As the consequence, this condition encourages the researcher to conduct this research. The purpose of this study is to reveal the effectiveness of the use of the flipped classroom learning strategy towards student's motivation, discipline and learning results. This research is expected to contribute to improving the quality of learning, especially in those that share similar characteristics with the CAR. The results are also expected to enrich reference to the application of the flipped classroom learning strategy on improving the quality of the learning process and results and assisting the lecturers in choosing quality learning as enrichment to the mastery of pedagogical competence.

MATERIALS AND METHODS

This research uses quasi experimental method with two groups as experimental and control samples. This experiment was conducted in the Educational Technology Study Program Faculty of Education, Padang State University on the subject of classroom action research (PTK). Two classes chosen by using purposes random

sampling technique are 201420040025 session as an experimental group and 201420040018 as the control one. The data that meets the requirements to be processed in both groups was 66 students (33 students in the experimental group and the rest 33 students in the control one).

Data collection techniques of learning motivation and discipline are conducted by using observation sheet. These instruments have been declared constructionally valid by the experts and fit for use. Scores of learning motivation and discipline gained from 5 times observation, i.e., on the 3rd until the 7th week by using a likert scale models (4 = excellent, 3 = good, 2 = quite good and 1 = poor).

Data on learning results are taken from the average results of the written test (50%) combined with assessment products in the form of classroom action research proposals (50%) performed at week 8. Data were analyzed by comparing the average scores and significance of the difference using a t-test. All three have met the prerequisites of data analysis through normality test and homogeneity.

Learning motivation observed in this study consists of five indicators, namely; perseverance in learning tenacity in the face of difficulties, interest in learning the desire to excel in learning and learning autonomy (Sardiman, 2014). Meanwhile, learning discipline has also five indicators, namely: pertinence of entering the class active participation in learning compliance with the duty guides timeliness of the assignment submission and regularity of the task sequences.

Learning activities in the experimental classroom were carried out with the following five learning steps; the learning material distribution is in the form of presentation (PowerPoint) softcopy a week prior to the discussion of the material; describing the tasks that must be completed; in depth discussion within small groups of lecturers and students while the learning process is taking place giving recommendations for improvements to the students and evaluation along with the learning progress of the classroom members. While lecturing, lecturer has discussions with each group consisting of five people for 15 min performed in turns. Classroom discussion and explanation of the study plan and its subsequent tasks are undertaken within the last 30 min.

Meanwhile, the learning in the control classroom is conducted by using a strategy that has been implemented before beginning the activities, i.e., introduction activities, core activities and closing activities. The core activities are conducted by using PowerPoint presentations equipped with additional explanations and questions-answers on the similar material as the other

group; however, the latter was not given the presentation softcopy, materials and examples. After carrying out the learning for 8 weeks both groups were given tests and the research proposals were collected followed by assessment.

RESULTS AND DISCUSSION

There are three data analyzed in this study. They are the learning motivation score, the learning discipline score and learning results (tests+products).

Based on the data analysis of the learning motivation obtained from the 5 indicators above, it can be drawn a comparison between the experimental and control groups as shown in Table 1. On the indicator of "Perseverance in learning", the experimental group has higher scores compared to the control one. Both groups evidently have a slight different score on the indicator of "Tenacity in the Face of Adversity". The same condition also occurs on the indicator of "Learning Autonomy" with almost the same score. On the indicator of "Learning Interest", it was revealed that the experimental group score higher than the control group. However, the overall score of the experimental group's learning motivation was higher (3.40) than the control group (3.28).

The figure shows that students who study with the flipped classroom learning strategy have higher learning motivation than those with the conventional one. After testing the significance of differences with t-test, it is obtained that $t_{count} = 0.2209$ and $t_{table} = 0.0632$. The test results proved that there are significant differences on learning between the experimental and control groups due to $t_{count} > t_{table}$. Based on the results of the analysis, it can be concluded that the implementation of the Flipped Classroom Learning Strategy significantly more effective in improving student's learning motivation.

Based on the analysis of the learning discipline data obtained from the 5 indicators, it can be expressed the comparison between the experimental and control groups as shown in Table 2. On the indicator of "Timeliness of entry", it revealed that the score of the experimental group did not differ significantly compared with the control one. It means that the average students in both groups had a high level of learning discipline to enter the classroom on time. On the "Activeness in Learning" indicator there is a difference between the two groups but not in significant manner. However, the experimental group has significantly higher scores than the control one on the rest of the indicators "Conformance Task with a Guide", "Timeliness of the assignment Submission" and "Regularity of the Task Sequence".

Table 1: Average learning motivation score found on the experimental and control groups based indicators

Indicators	Average scores	
	Experimental group	Control group
Perseverance in learning	3.47	3.20
Tenacity in the face of adversity	3.22	3.21
Learning interest	3.51	3.35
The desire to excel	3.49	3.33
Learning autonomy	3.33	3.32
Average total score	3.40	3.28

n = 33; SD experiment = 0.24; SD control = 0.27

Table 2: Average learning discipline found on experimental and control groups

Indicators	Average scores	
	Experimental group	Control group
Timeliness of entry	3.78	3.79
Activeness in learning	3.77	3.70
Conformance task with a guide	3.38	3.26
Timeliness of the assignment submission	3.39	3.21
Regularity of the task sequence	3.52	3.35
Total score average	3.57	3.46

n = 33; SD experiment = 0.25; SD control = 0.21

Table 3: Average learning results found on experimental and control groups

Assessment types	Average scores	
	Experimental group	Control group
Tests on learning results	87.64	85.35
Products assessment (classroom action research proposals)	83.88	79.31
Total score average	85.76	82.33

n = 33; SD experiment = 9.45; SD control = 9.39

The average score of the student's learning discipline acquired by the experimental group was 80.91 while the control one was 77.97. The figure shows that students who study with the flipped classroom learning strategy have a higher learning discipline than the conventional one. Testing on the significance of the difference with the t-test obtained that $t_{count} = 0.1303$ and $t_{table} = 0.0632$. The results of these tests show that there are significant differences on the learning results between the experimental and control groups due to $t_{count} > t_{table}$. Based on the results of the analysis, it can be concluded that the implementation of the flipped classroom learning strategy is significantly effective in improving student's learning discipline.

Based on the analysis of the learning results data obtained from the merging of the tests results and the assessment products, it can be declared a comparison between the experimental and control groups in Table 3. From the tests of the learning results obtained, it is shown that the experimental group was significantly higher than the control one. At the same time, on the final value of products produced in the form of classroom research proposals, the former is also significantly higher than the

latter. Overall, it is revealed that the total learning results achieved by the experimental group was significantly higher compared with the control one.

The average learning results for the experimental group was 85.70 and the control one was 82.33. These scoring achievements show that students who study with the flipped classroom learning strategy are able to achieve higher results compared to those who study with the conventional one. Tests using the t-test obtained that $t_{count} = 0.2209$ and $t_{table} = 0.0632$, proving that the learning results of the experimental group was significantly higher ($t_{count} > t_{table}$). Based on the results of the analysis above, it can be concluded that the application of the flipped classroom learning strategy has a significant influence on the improvement of student's learning outcomes.

Based on the data analysis and testing of the proposed three hypotheses, it revealed that all of them are acceptable. It means that the use of the Flipped Classroom Learning Strategy has a significant impact on the increased motivation, discipline and student's learning results. The successful implementation of the flipped classroom learning strategy in improving student's motivation, discipline and learning outcomes is due to several strong characteristics of strategy itself. Johnson (2013) stated that the flipped classroom learning strategy can be given by educators in such ways that minimizes the amount of direct learning in their teaching practices while maximizing interactions with each other.

Student's learning motivation with the flipped classroom learning strategy is significantly higher compared to the conventional one. The increased motivation occurs because the learning process itself provides opportunities for students to satisfy their learning needs. This is supported by Lakmal and Phillip opinions in 2015 (Ryan and Deci, 2000a, b), stating that the learning environment created by the flipped classroom approach likely meets the needs of students on competence, autonomy and relatedness. As the consequence their intrinsic learning motivation levels greater.

Learning activities in the flipped classroom learning strategy provide relatively much more time to learn outside the classroom. It enables students to be able to explore contents through group discussions that have positive impact on increased extrinsic learning motivation. Niemiec and Ryan (2009) together support this claim and state that learning outside the classroom with some small discussion groups in a secured context will further enhance individual motivation and engagement in learning.

Student's learning discipline attending the flipped classroom learning strategy is also higher than those attending the conventional one. It is seen from the student's compliance in completing the tasks, the timeliness of the assignment submission and regularity in the assignment task order. An important step that allows the increase of the learning discipline is the weekly lecturer's control on the student's learning progress through the task of in depth discussions. This is in line with Enfield (2013)'s which shows that students are more confident about the activities in the classroom, ready for learning with better motivation due to the fact that the flipped classroom learning model can increase student's learning motivation, liveliness and study skills. This research was also supported by research conducted by Sdouh (2013) on the differences between the average of achievements, skills and attitudes of the creative use of the flipped classroom-based learning model by leveraging technology and brainstorming which can improve all cognitive, affective and psychomotor domains effectively with significant results.

The materials provided in the form of PowerPoint presentations are important points to facilitate students to learn outside the classroom. Presentations of the contents are enriched with images, animations and interesting color combinations. This varied information makes students not getting bored in understanding the designed contents (Ah Sanaky, 2011). Students are motivated to enroll lectures with PowerPoint presentations rather than those without them (Drouin *et al.*, 2013). In addition, the presentations also gave higher ratings to their programs and self-efficacy (Susskind, 2005) and their instructors (Nouri and Shahid, 2005) when they use PowerPoint presentations-based lectures.

Students stated that the flexibility of learning time enables them to be able to adjust conditions and the availability of learning time at home. Students can set the rhythm of learning in the span of time between meetings. Research findings from Raver and Maydosz (2010) also support the results of this study which stated that students provided with the copies PowerPoint presentations as lecture notes before or after the lectures have better pre-test/post-test results than those who were not given this assistance.

Giving a clear job scope and time (structured) also impacts on student's learning motivation and discipline. Students are given assignments every week gradually starting from formulating the titles of the classroom action research proposals. Setiawan (2016) concludes that there

are significant differences in learning results between classes whose students are given structured tasks (experimental class) and those that are given unstructured tasks.

The analysis process on the difficulties faced by students conducted in depth small group discussions. Lecturers directly suggest improvements so that students are confident to continue to the next tasks. Abeysekera and Dawson (2015) states that the pre-class data analysis could inform class members in a timely fashion design activities. He added that the flipped classroom learning strategy can tailor activities and guidance appropriately with student's skill levels in the classroom. Similarly, the most appropriate cognitive load management techniques can be selected automatically based on the analysis of the student skills.

The last 30 min plenary discussion of the lecture for evaluating student's learning progress also has impacts on student's learning results. Lecturers give some important notes on the progress and barriers faced by students, learning problems and solutions, giving positive comments as the motivation for other students to be able to complete the tasks together. This process gives attention, relevant knowledge, confidence and satisfaction to students. This is in line with the research findings conducted by on the motivational management strategies which concluded that motivational management strategy is superior to the conventional motivational management strategies. Asep (2007) stated that giving motivation can foster student's self-confidence and increase their engagement in the learning process. In addition, educators were able to explore student's potential skills such as communication, information process, logical-and-systematical thinking and draw conclusions.

The student's written test results and learning products using the flipped classroom learning strategy are significantly higher than the achievements of those who studied with conventional one. The results are consistent with the research findings conducted by entitled "Case Studies and the flipped classroom". It proves that there is a positive effect on the implementation of the flipped classroom learning model on student's learning results. According to Roehl *et al.* (2013), the increased learning results are caused by students who are able to spend time in class to solve problems, develop their understanding on the learning concept and engage in collaborative learning.

The success on the implementation of the flipped classroom learning strategy in terms of motivation,

discipline and learning results improvements is because of profitable learning process both inside and outside the classroom reveals some other advantages of the flipped classroom learning strategy. They are: students can learn at the individual pace of absorption; lecturers know their students individually due to the plenty of the time; lecturers can prepare a wide variety of the lecture presentation materials accommodating all the student's absorption speeds for parallel classes, students can see the materials from other classes; lecturers can cooperate with their colleagues to prepare the mutually enriching materials.

CONCLUSION

Based on the results and the above discussion, it can be concluded that the implementation of the flipped classroom learning strategy has provided an increase in the learning quality. The undertaken core of the learning activities provides contents in the form of PowerPoint softcopies given prior to the lectures. The given copies describe the tasks to be completed in depth small group discussions conducted by lecturers and students, improvement suggestions to the students, a joint evaluation on the classroom member's learning progress and student's learning results. The implementation of the flipped classroom learning strategy has a positive effect on the improvement of student's learning motivation and discipline.

The flipped classroom learning strategy is also an effective strategy to increase learning motivation since there is lecturer's attention on their student's learning progress. Students get attention through objective assessments on task implementation. The student's learning discipline, especially in completing tasks, increases due to weekly continuous and scheduled checks. Students tend to have a sense to meet the given submission deadline. Furthermore, this condition is also supported by the existence of the "early warning system" for those are negligent in keeping the prescribed time limit.

The flipped classroom learning strategy is proven to effectively improve student's learning results due to the flexibility of time in studying learning materials. Teaching materials can be learnt anytime and anywhere for a couple of days prior to the next lectures. This time flexibility feature enables students to individually arrange the learning time. Students have a full opportunity to do their tasks accompanied by lecturers. By having so, we can say for sure that every student has understood the materials presented before moving on to the next matter. Students also have a high motivation to collaborate, share ideas

and projects with his friends. In other side, lecturers have the opportunity to review their applied lesson plans through a good communication between them and their students.

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