Project-Based Learning Model Development Using Flipped Classroom for Drawing Learning in College

Farida Mayar [a,*], Febri Wandha Putra [b], Fenny Ayu Monia [c], Siti Osa Kosassy [d], Rima Pratiwi Fadli [b], Ririen Arinalhaq [e]

[a] Department of Early Childhood Education, Universitas Negeri Padang, North Padang, Padang, 25171, Indonesia
[b] Department of Guidance and Counseling, Universitas Negeri Padang, North Padang, Padang, 25171, Indonesia
[c] Department of Islamic Religious Education, Universitas Islam Negeri Sjech M. Djamil Djambek Bukittinggi, Bukittinggi, 26181, Indonesia
[d] Department of Public Administration, Sekolah Tinggi Ilmu Administrasi, South Padang, Padang, 25214, Indonesia
[e] Teacher Professional Program Students, Universitas Negeri Padang, North Padang, Padang, 25171, Indonesia
Corresponding author: *farida@fip.unp.ac.id

Abstract— **The learning process was initially carried out online during the pandemic then after the post-pandemic, learning activities began to be carried out face-to-face. This raises a new problem, because lecturers who teach are starting to be required to use various media in the learning process in the new normal era. But in reality, the lecturers still use old methods such as lectures or task-based learning. Therefore, the research objective is to develop a new model that can be used in the learning process in higher education. This type of research is development research using the ADDIE approach. The instrument used was a student learning motivation questionnaire and a student learning satisfaction questionnaire following the lesson. Another instrument used is a Likert model scale with three alternative answers. The operational procedure taken in this research and development goes through three stages, namely: (1) preliminary study, (2) preparation of conceptual models (3) validity test and (4) practicality test. The results of the validity test show that the model book and manual are in the very valid category from the aspects of design, language and content. Furthermore, the practicality test results show that model books and guidebooks for project-based learning models using flipped classrooms for drawing lectures in tertiary institutions are practically used by lecturers. The implications of this research can help lecturers in designing practical learning.**

Keywords—**Model; project-based learning; flipped classroom; drawing learning.**

I. INTRODUCTION

In the post-COVID-19 pandemic, educators must be able to design learning models that are under the material and character of students. Using applications in learning during the pandemic is very helpful for educators in the learning process [1], [2]. Educators must be able or accustomed to teaching by utilizing online media designed to be easily accessed effectively so that students can easily understand them in learning activities at universities [3], [4]. Educators must design learning models that are light and effective by utilizing the right tools or online media and under the material being taught [5], [6].

The statement is not under the conditions in the field. The phenomenon that occurred was in the post-pandemic process of learning to draw courses. Drawing courses provide insight into fine art in theory and practice. From this explanation, it is known that the drawing course teaches students drawing skills through practices designed in the Semester Lecture Plan (RPS). However, in reality, the drawing lecture process carried out by lecturers during the pandemic uses more conventional learning methods or models, such as the lecture method or giving note assignments that make students bored. So, students who attend lectures experience boredom and show a decrease in motivation to take part in lecture activities. The decline in students' learning motivation also affects the decrease in their learning outcomes [7], [8]. In other words, using inappropriate learning methods or models will lead to other problems in the lecture process [9], [10]. This phenomenon also affects student satisfaction in attending lectures. Almost all students who take online lectures are not

satisfied with the methods used by lecturers. Online learning reduces student satisfaction [11], [12].

The traditional instructional learning system at the University needs to be replaced with a more interactive learning system to make teaching more interesting [13], [14]. A phenomenon that often occurs during the process of online learning activities is that most students are more passive, reluctant, or embarrassed to express their opinions; this situation will undoubtedly interfere with the smooth learning and creativity of students in learning activities [15], [16]. In addition, the learning process is still teacher-centered; teachers communicate in one direction by providing a lot of material and giving few opportunities for students to interact through performance or verbal communication [17], [18]. Then, Martaida et al [19] explained that the success of learning can be increased if the learning process can take place with the availability of supporting facilities and infrastructure and the ability of educators to manage classes using appropriate methods, strategies or models[19]. With the rapid advancement of technology and information in the 21st century, teachers must change the way of teaching by utilizing existing technology [20], [21].

To increase the effectiveness of post-pandemic learning, a new learning model was developed: the project-based learning model based on the flipped classroom. Project-based learning allows students to plan learning activities, carry out collaborative projects, and produce work products that can be presented to others[22]–[24]. The characteristics of Project Based Learning are developing students' thinking skills, enabling them to have creativity, encouraging them to work together, and directing them to access information on their own and show it [25]. In addition, the flipped classroom is a new learning model that is still rarely used. The order of the learning process is reversed from conventional learning, where students are given assignments at home as preparation for lectures[26]–[28].

Based on the search results of previous research, no researchers have investigated the use of the flipped classroom-based project-based learning model in the classroom. Therefore, this study develops a flipped classroom-based project-based learning model for drawing university lectures.

II. MATERIALS AND METHOD

To create a new learning model, the type of research used is research and development (R & D) with the ADDIE approach, which comprises five stages: analysis, design, development, implementation, and evaluation. The research location is in the Department of Early Childhood Education Teacher Education. Research subjects are lecturers who teach drawing courses. The instruments used to collect research data are student learning motivation questionnaires and student learning satisfaction questionnaires following the lesson. Another instrument used is a Likert model scale with three alternative answers. The operational procedure taken in this research and development goes through three stages, namely: (1) preliminary study, (2) preparation of conceptual models (3) validity test and (4) practicality test. The technique used to test the alignment of the experts' answers is the intercorrelation coefficient with the help of the SPSS application.

III. RESULTS AND DISCUSSION

The data that has been collected according to the procedure is directly analyzed according to the analysis technique that has been determined. The results of the analysis can be seen as follows.

A. Results Need Analysis

Needs analysis in terms of student learning motivation and student satisfaction during lectures during the pandemic. The results of data processing showed that of the 155 students who took the drawing class, as many as 22 (14.19%) students had high learning motivation, 47 (30.32%) students had low learning motivation, and 86 (55.48%) students had moderate motivation. The results of the analysis also showed that students who have low motivation more than students who have high motivation. Based on the results of the student satisfaction questionnaire analysis during the pandemic learning period, it was found that as many as 67 (43.22%) students were dissatisfied with drawing lectures during the pandemic, 75 (48.38%) students were quite satisfied with drawing lectures, and as many as 13 (8.38%) students were satisfied with their drawing lessons during the pandemic. Data analysis from the student learning satisfaction indicator shows that the lowest indicator is reliability with a percentage of 48.57%. The empathy indicator is in the low category with a percentage of 54.35%. The responsiveness indicator with a percentage of 59.89% is in the low category, the assurance indicator with a percentage of 64.32% is in the medium category and the last is the tangible indicator with a percentage of 64.86% is in the medium category. This also means that student satisfaction in learning during online learning is a lot of students who are not satisfied with implementing learning carried out by lecturers.

B. Conceptual Modeling

There are five elements of making a learning model, namely: (1) syntax, which is a learning chain or can also be called a phase; (2) Social System, namely the role of educators/lecturers and students and the types of rules needed in learning, (3) the principle of reaction, namely providing an overview to educators/lecturers about viewing and responding to student questions, (4) the support system, namely the conditions required by the module, (5) the impact of instructional and accompaniment [29].

C. Validity Test Results

The products produced through the model development process in this study are model books and project-based learning model guidebooks using a flipped classroom for drawing lectures. Experts in language, design, and materials carry out a validity test to determine whether the resulting product is valid. We can see the results of the validity test in the following Figure 1. The results of the data analysis above show that the project-based learning model book using the flipped classroom for drawing lectures is valid in terms of content, appearance, and language for use by lecturers. So that this book can be tested in the field (University) for use by lecturers.
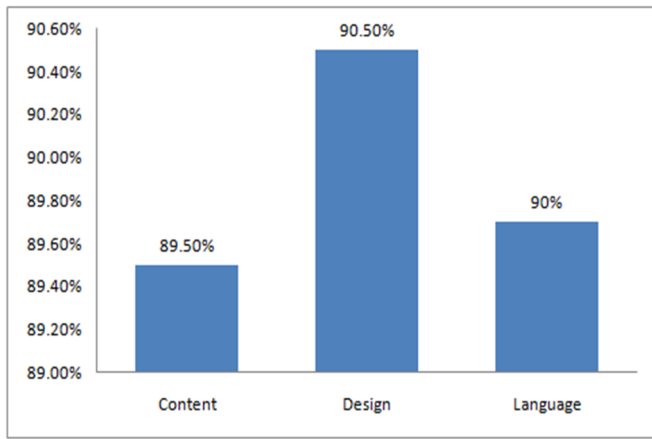
Fig. 1 The results of the Model Book Validity Test

Furthermore, the results of the guidebook validity test can be seen in Figure 2 below.
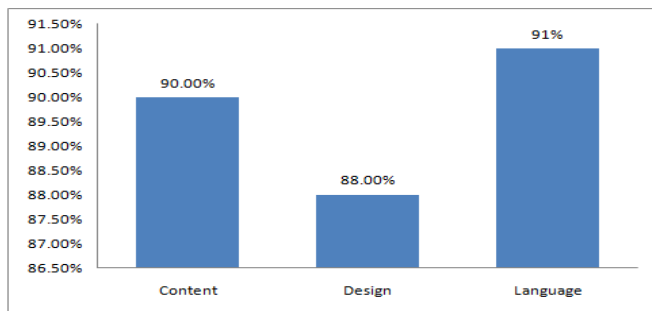

Fig. 2 Validity Test Results of the Model Guidebook

The results of the data analysis above show that the project-based learning model manual using the flipped classroom for drawing lectures is valid in terms of content, appearance and language for use by lecturers. So that this guidebook can be tested in the field (University) for use by lecturers.

D. Practical Test Results

The practicality test aims to determine the developed model's practicality level. The practicality test was carried out by 5 lecturers who taught drawing courses for early childhood. The results of the practicality test can be seen in the following table. The entire document should be Times New Roman at 10 points in size. Other font types and sizes may be used if needed for special purposes. Recommended font type and sizes are shown in Table 1.

TABLE I
PRACTICAL TEST RESULTS OF MODEL BOOKS

No	Validator	Score	Validity (%)	Information
1	Validator 1	39	88.63	Very Practical
2	Validator 2	40	90.90	Very Practical
3	Validator 3	39	88.63	Very Practical
4	Validator 4	40	90.93	Very Practical
5	Validator 5	39	88.63	Very Practical
Total		197	89.54	Very Practical

The results of the data analysis of the practicality test of the project-based learning model book using a flipped classroom that has been designed to obtain very practical value interpretations by practitioners. So, it can be concluded that the project-based learning model book using the flipped classroom can be used for drawing lectures in universities. Furthermore, the results of the practical analysis of the project-based learning model manual using the flipped classroom for drawing lectures can be seen as follows.

TABLE II
PRACTICAL TEST RESULTS OF THE MODEL GUIDEBOOK

No	Validator	Score	Validity (%)	Information
1	Validator 1	55	85.93	Very Practical
2	Validator 2	59	92.18	Very Practical
3	Validator 3	54	84.37	Very Practical
4	Validator 4	58	90.62	Very Practical
5	Validator 5	57	89.06	Very Practical
Total		283	88.43	Very Practical

Based on the results of the analysis of the data above, information was obtained that the overall designed guidebook scored 88.43% in the very practical category. So, it can be concluded that the lecturer's guidebook in implementing the project-based learning model using the flipped classroom for drawing lectures in universities is very practical for lecturers to use.

E. Discussion

The data analysis above shows that the overall level of student learning motivation in the post-pandemic lecture process is in the moderate category, this is also followed by the results of the student satisfaction questionnaire analysis of the methods used by lecturers in post-pandemic lecture activities. The results show that there is a decrease in student motivation, and it does not satisfy students with the method used by the lecturer. This is supported by the opinion of Mayar et al [30] which states that student motivation and satisfaction in the learning process is determined by the method used by the lecturer. Unpreparedness in facing online learning will affect decreasing student motivation and achievement [31]–[33]. The data analysis above is also supported by the research results of [14], [34]; revealed that, during the online learning process, it dissatisfied many students with the learning system implemented by teachers in schools. This is because the methods used during learning are conventional [35], [36].

Data analysis of the development of a project-based learning model using a flipped classroom for drawing lectures in universities shows that the developed model is valid and practical to use by lecturers. The results are supported by the findings of [22] who found that project-based learning is a suitable learning model to help students gain new knowledge [22]. Rasyid and Yumi [37] stated that project-based learning helps students to improve their letter-writing skills. Genc revealed that the project-based learning model can influence students' attitudes towards the environment. This can be seen from the perspective of students who consider the

environment to benefit them. Then, [38], [39] found that students enjoyed learning with the flipped classroom model. Other study results also mention that project-based learning models can affect students' creative thinking skills. Then, [40], [41] also found that the project-based learning model can train creative thinking, collaboration, project management, and is challenging so that it is suitable to be applied in lectures.

Imaniah and Bariah [42] revealed that mobile learning with the flipped classroom model is workable to use in learning. This is also supported by the findings of Fedistia and Musdi [43] who found that this shows that flipped classroom-based learning tools are effective for improving students' mathematical reasoning abilities. Tang et al. [44] also mention that the flipped classroom model can improve student performance to varying degrees, depending on the teacher's instructions. So that, with increasing student performance, students also get satisfaction in the learning process [45].

According to Laboy-Rush [46] the steps of Project Based Learning are as follows:
- Reflection, bringing students into a problem and providing motivation to investigate and solve the problem.
- Research, students conduct research, explore information from various sources relevant to conceptual development.
- Discovery, students have found a suitable model for implementing a project to design and design.
- Application, students apply the model that has been designed. At this stage, students test a model that has been designed to answer a problem by connecting between disciplines.
- Communicating, students describe and present the results they get collaboratively, receive useful feedback for the improvement of a better project.

Then, [47] also revealed that the main stages in preparing the project-based learning model are three, namely:
- Debriefing of skills competencies, aims to make students gain knowledge and understanding of the expected skills.
- Project work, student assignments as project work in this model are lifted from real-world problems and processing realistic work stages.
- Evaluation, aims at to reveal the achievement of the learning process and student competence, so that it becomes a material for assessment and evaluation [47].

In preparing the project-based learning model, it also includes elements of the flipped classroom model. According to [48], Flipped Classroom is a form of blended learning (through face-to-face and virtual/online interactions) that combines synchronous learning with asynchronous independent learning [48]. Synchronous learning usually occurs in real time in the classroom. Meanwhile, asynchronous learning is learning that is more independent. Content is usually accessed through some form of media on digital platforms [49]. The flipped classroom model comprises four pillars, namely, 1) Flexible, 2) Environment, 3) Learning Culture, 4) Intentional Content, and 5) Professional Educator [50]. So, the steps in the project-based learning model using the flipped classroom are; 1) Providing material through video, 2) Brainstorming, asking questions

related to the material to be developed in the project, 3) Dividing work groups, 4) Discussing project planning, 5) Developing strategies and planning project development, 6) Discussion and evaluation of project development, 7) Perform project percentages and 8) Project evaluation.

IV. CONCLUSION

After analyzing the data and explaining the research findings, it can be concluded that the development of a project-based learning model using a flipped classroom for drawing lectures in universities has a positive impact on lecturers who teach. This is evidenced by the results of the validity test in the model book and manual, which show very valid results in terms of appearance, content, and language. Then, the results of the practicality test also show that model books and guidebooks are very practical to use in the drawing lecture process.

The learning steps in the project-based learning model using the flipped classroom are 1) Flexible, 2) Environment, 3) Learning Culture, 4) Intentional Content, and 5) Professional Educator. So, the steps contained in the project-based learning model using the flipped classroom are; 1) Providing material through video, 2) Brainstorming, asking questions related to the material to be developed in the project, 3) Dividing work groups, 4) Discussing project planning, 5) Developing strategies and planning project development, 6) Discussion and evaluation of project development, 7) Perform project percentages and 8) Project evaluation.

The limitation of this research is that it is only conducted on lecturers who teach drawing courses. There have been no results of effectiveness tests conducted on students who take drawing lessons. Therefore, the aim of the next researcher is to implement the model in the form of an effectiveness test for students.

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