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Analysis of Student Needs for The Development of Project-Based Learning Digital Modules to Improve Understanding of Concepts in Aviation English Courses

Fitri Masito[1], Sudarwan Danim[2], Badeni[3], Yeti Komalasari[4], Yupika Maryansyah[5]

[1,4]Politeknik Penerbangan Palembang
[2,3]Universitas Bengkulu
[5]Universitas Muhammadiyah Bengkulu
Email: *fitri.masito@poltekbangplg.ac.id*

ABSTRACT

The research aims to analyze student needs for developing project-based learning digital modules to improve understanding of concepts in the Aviation English course. A total of 77 cadets who took the Aviation English course at the Politeknik Penerbangan Palembang were involved in the research conducted from May to June 2023. The research instrument used is a closed questionnaire sheet that has four answer choices. Analysis of cadets' needs to develop project-based digital modules was carried out using descriptive statistical analysis. This is done by processing percentage data from filling out cadet questionnaires. The percentage is obtained based on the calculation of the modified Likert Scale. The results showed that as many as 77 respondents or 100% of respondents strongly agreed to the development of project-based learning digital modules to improve understanding of concepts in the Aviation English course.

Keywords: Aviation English, Concept Understanding, Development, Digital Module, Project-Based Learning,

A. INTRODUCTION

Education is a way to improve the welfare of the nation, so education must be able to innovate and compete with changes that occur (Aprima &; Sari, 2022; Mardhiyah et al., 2021). One form of change that can be done is to use technology as a learning medium so that the learning process can make students develop their potential actively. Higher education is one of the vocational education whose goals are to prepare students to work in accordance with their skills. Education that prepares students to enter the workforce which is through a process in learning and related to technical and practical problems, is referred to as vocational education (Delianti &; Jalinus, 2020). Efforts made to encourage the realization of the implementation of a fourth industrial era-oriented curriculum in all vocational and academic higher education are by adding new literacy to the higher education curriculum.

The goal is to improve the quality of higher education learning and boil down to improving the quality of graduates with a curriculum that refers to SN dikti. In order to achieve learning objectives, it is necessary to use effective teaching materials which are materials that have been systematically compiled and show competencies that should be mastered by students (Arumsari, 2014).

The importance of fostering motivation and understanding of student learning concepts causes the need for innovative learning. Learning that is suitable for fostering motivation and understanding of student concepts is project-based learning. Project-based learning is an innovative learning that emphasizes contextual activities through complex activities, involving students in conducting investigations independently and producing real products (Azizah &; Widjajanti, 2019; Lawe, 2019; Wibowo et al., 2022). Concept understanding is a continuation of concept planting, which aims to make students better understand a learning concept, and refers to understanding (Heryanto et al., 2022; Nurhayanti et al., 2022). Based on observations, in fact, there are still many students who do not understand the concept of learning. Among many learning models, there is one learning model that emphasizes students are actively involved in solving problems assigned by teachers in the form of projects to achieve learning outcomes. The learning model is the Project-Based Learning Model (*Project Based Learning*). The root of the problem is the use of learning models that are felt to have not created comfortable and interesting learning conditions that affect the motivation and learning outcomes of students' understanding of concepts (AL et al., 2023).

There are challenges and obstacles above causing not optimal learning process at aviation polytechnics, especially in English Aviation courses and several other subjects. This problem, of course, if it drags on, the learning process cannot be carried out properly, so it can result in the quality of learning being less good. This will have an indirect impact on the quality of the Aviation Polytechnic cadet graduates that will be produced. The problems faced today are not only faced by aviation polytechnics, but are almost felt in other aviation polytechnics. Therefore, a Project-Based Learning digital media development solution is needed

Learning usually uses learning media in the form of modules. Modules are like guidebooks used by students when in learning activities where in the module there are learning materials, investigation activities based on concepts, activities, information and examples of their application (Imamora et al., 2020; Kurniawan et al., 2022; Meliana et al., 2022; Solihudin, 2018). The challenge for educators is to be able to provide digital learning media by utilizing existing technology. Therefore, researchers want to see the effectiveness of using digital learning modules where the discussion of material and content is complete. With a complete and systematic e-module, it is expected that there will be interest and willingness from students to better learn and practice the steps in the e-module that can support learning outcomes. Because each student has unique learning differences, has strengths and weaknesses, diverse interests and concerns in learning (Santyasa, 2009).

Based on this, through the development of Project-Based Learning-based digital modules that will be developed, it is hoped that the digital modules to be developed can be implemented in higher education learning so that they can also help achieve the fulfillment of 8 Higher Education IKUs, namely: 1) IKU about graduates getting decent jobs, 2) IKU about students getting experience outside the campus, 3) IKU about Lecturers doing outside activities campus, 4) IKU about practitioners teaching on campus, 5) IKU about the results of lecturer performance used by the community, 6) IKU about study programs in collaboration with world-class partners, 7) IKU about collaborative and participatory behavior, 8) IKU about international standard Study Programs. The achievement of IKU in higher education is an important factor today to support superior accreditation at the higher education level. This research will also involve collaboration that has been established previously with the University of Bengkulu and also utilize the results of research that has been done previously that has been going well. In addition, with this collaborative research, it can strengthen good cooperation between universities (Aviation

Polytechnic and Bengkulu University), especially in the development of Project-Based Lerarning-based digital modules and expected publication outputs.

There are several previous studies that are relevant to this research, including research conducted by (Delianti &; Jalinus, 2020). In his research, entitled "effectiveness of e-module-based *Project Based Learning* in visual programming courses". From the results obtained, it can be concluded that using e-modules can increase student understanding with 86% results. Other relevant research is (AL et al., 2023). In his research entitled "the effectiveness of model application *Project Based Learning* to the motivation and ability to understand the concepts of high school students". The results obtained in this study are that there is an increase in student learning motivation after applying the model *Project Based Learning* In basic programming subjects, there is then an increase in students' concept understanding ability after applying the model *Project Based Learning*. In addition, the ability to understand students' concepts in the application of learning models *Project Based Learning* More effective than the ability to understand students' concepts in the application of conventional learning models. Then there is also research conducted (Khairani et al., 2022). In his research entitled "The Effectiveness of Developing Module-Based Learning *Project Based Learning* During the pandemic in ICT subjects at State Theme High Schools". The results obtained in this study are based learning modules *Project Based Learning* The resulting media is stated as a practical media that is responded by teachers and students, namely with the practicality value of teacher responses of 85.42% and student responses of 84.11%. Then the resulting Project-Based Learning module is effectively used with postest results seen from the completeness of student classics by 80% and N Gain Score of 0.44 with the medium category.

From the description above, the researcher will conduct a collaborative research entitled "Analysis of the Development Needs of Project-Based Digital Modules *Base Learning* to Increase Understanding of Concepts in Aviation English Courses".

B. METHOD

A total of 77 cadets who took the Aviation English course at the Politeknik Penerbangan Palembang were involved in the research conducted from May to June 2023. The research instrument used is a closed questionnaire sheet that has four answer choices. Analysis of cadets' needs to develop project-based digital modules was carried out using descriptive statistical

analysis. This is done by processing percentage data from filling out cadet questionnaires. The percentage is obtained based on the calculation of the modified Likert Scale. The following Table 1 shows the quantitative values assigned to instrument items:

Table 1. **Likert Scale Calculation**

Valuation	Scale Value
Totally Agree	4
Agree	3
Disagree	2
Strongly Disagree	1

The questionnaire is tested for validity and reliability using SPSS with the following conditions: Valid if r_{count} greater than the value of r_{table} ($r_{count} > r_{table}$), Invalid : if r_{count} smaller than the R $value_{table}$ ($r_{count} < r_{table}$), Reliable if cronbach's alpha value > 0.60, and Unreliable if cronbach's alpha value < 0.60 (Budiwibowo &; Nurhalim, 2016). The following are the results of the instrument validity and reliability test.

Table 2. **Instrument Validity Test Results**

No Item	r calculate	r table	Information
1	0,701956		Valid
2	0,573491		Valid
3	0,730904		Valid
4	0,69184		Valid
5	0,700076		Valid
6	0,527495		Valid
7	0,668614		Valid
8	0,492394		Valid
9	0,616973		Valid
10	0,65681		Valid
11	0,666857		Valid
12	0,634111	0.2242	Valid
13	0,662408		Valid
14	0,634055		Valid
15	0,599567		Valid
16	0,712387		Valid
17	0,632547		Valid
18	0,739708		Valid
19	0,738726		Valid
20	0,734176		Valid
21	0,745885		Valid
22	0,751343		Valid
23	0,761918		Valid

The table above shows that all statement items in the questionnaire are valid, meaning that all items can be used to measure what they want to measure.

The following are the results of the instrument reliability test:

Table 3. Instrument Reliability Test Results

Cronbach's Alpha	N of Items
.941	23

The table above shows that the instrument used is reliable because it has an alpha Cronbach value greater than 0.60. Analysis of the results of the needs analysis is carried out quantitatively using the following formula.

$$p = \frac{n}{N} \times 100\%$$

Where P is the percentage of the questionnaire analysis results, n is the total score of the assessment, and N is the maximum possible score obtained. For the Likert scale of the score interpretation model can be seen in the following table.

Table 4. Likert Scale Interpretation

Percentage (%)	Category
0 % - 25 %	Strongly Disagree
26 % - 50 %	Disagree
51 % - 75 %	Agree
76 % - 100 %	Totally Agree

C. RESULTS AND DISCUSSION

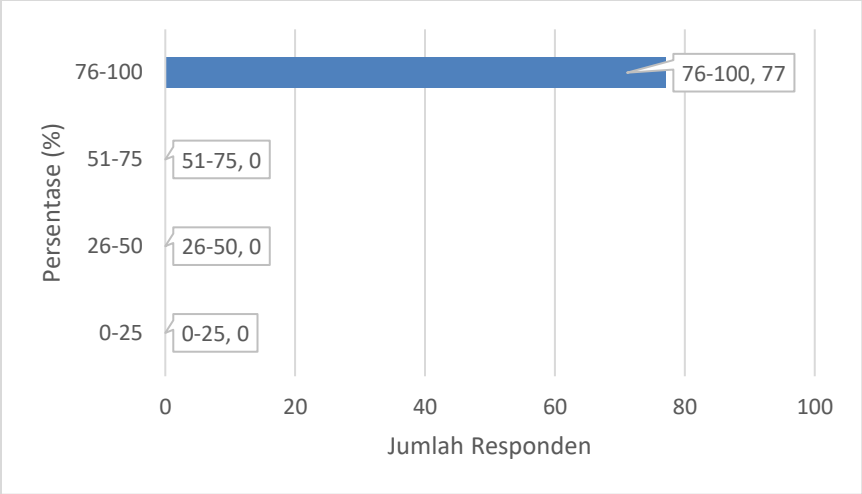

Figure 1. Graph of Needs Questionnaire Filling Results

From the picture above, it can be seen that there are as many as 77 respondents who occupy a percentage range of 76%-100%. Based on the interpretation of the Likert scale in table 2, the percentage of 76-100 falls into the category of strongly agree. This shows that all respondents involved in this study strongly agree to the development of a digital module based *on project base learning* to increase understanding of concepts in the Aviation English course.

As a generation Z (Digital), students prefer teaching materials whose presentation utilizes electronic media. The reason is because it is easy to carry everywhere, can be used anytime and anywhere, contains video, animation, audio and other digital components which certainly make teaching materials more interesting to use.

In addition, students also need teaching materials that are self-instruction, meaning that there are clear instructions that make it easier for students to use them and students can find out what kind of learning goals must be achieved. Then teaching materials that are Self contained means that the subject materials presented in them are complete so that I can study the material thoroughly, are Stand alone which means that the teaching materials stand alone or do not depend on other teaching materials or do not require other supporting tools in their use, are Adaptive which means that the teaching materials have adaptability to the development of science and technology, and is user friendly which means that the teaching material is friendly to its users or in the sense that it is not difficult to use.

In learning, students want activities that lead to produce a product output because it will be more meaningful. In addition, students also want learning that starts with essential things or fundamental questions to make it easier to understand the next learning. Then learning that allows

teachers (facilitating) or can help students design project plans, either independently or together in groups and can help students create schedules or timelines to complete a project on time. In addition, each process is monitored the progress of the project with the help of technology so that it can help students reflect or evaluate the investigation and processes.Students want learning that can help students to be able to restate a concept, help students to be able to classify objects according to certain properties (according to the concept), help students to be able to provide examples and non-examples of a concept, help students to be able to presents concepts in various forms of mathematical representation, helps students to be able to develop the necessary or sufficient requirements of a concept, helps students to be able to use certain procedures or operations, and helps students to be able to apply concepts or problem-solving algorithms in Aviation English courses.

D. CONCLUSION

In this study, as many as 77 respondents or 100% of respondents strongly agreed to the development of project-based learning digital modules to improve understanding of concepts in the Aviation English course.

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