International Journal of Multidisciplinary and Current Educational Research (IJMCER)
ISSN: 2581-7027 ||Volume|| 6 ||Issue|| 1 ||Pages 16-22 ||2024||

Need Analysis for Development of Interactive Learning E-Modules Project-Based to Improve Literacy Numeracy of In-Service Teacher Professional Education (PPG) Students at FKIP Khairun University

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ABSTRACT : This research aims to analyze the need for developing project-based learning e-modules that can facilitate students to improve their pedagogical numeracy literacy skills. The method used in this research is descriptive qualitative. Data was collected through interviews/presentations, document studies/observation sheets, and questionnaires. The results of data collection show that (1) the majority of in service Teacher Professional Education (PPG) students still have minimal competency and implementation of learning with Numeracy literacy as evidenced by the results of the LK 1.1 problem identification choice, no one chose the Numeracy Literacy problem, (2) PPG students feel that they have not optimally implemented literacy numeracy in school because the understanding of numeracy literacy is still low as evidenced by the results of presentation interviews LK 1.1 to LK 1.3, (3) PPG students have a background that tends to not maximize communication technology during the learning process, (4) the learning media used only uses video and YouTube and Quisis in the learning and evaluation process, (5) PPG students do not yet have handbooks or modules other than worksheet and LMS integrated teaching materials. The results of the needs analysis show recommendations for developing project-based interactive learning e-modules to increase the numeracy literacy of PPG In-service students at FKIP Khairun University.

KEYWORDS - e module, interactive, project, literacy, numeracy, ppg

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I. INTRODUCTION

The Empirical facts in everyday life we find a lot of information presented in various symbols which are representations of the information itself. For example, information about signs, advertisements containing health, social, political and other information. The information presented is usually presented in numerical or graphical form. The ability to read information that contains numeric or graphic information is very necessary to make the right decisions. Numeracy ability makes a very real contribution to the welfare of individuals and society. Increasing economic prosperity and employment competitiveness is obtained from human ability to use mathematics in the context of engineering, economics and other fields. Students' numeracy abilities are a reflection of the numeracy learning process at school. Teachers must be able to teach numeracy concepts starting from elementary school level. The world of education must urge that teachers' literacy abilities must be cultivated and implemented in learning. Literacy culture must be comprehensive in all areas of education. In 2016, the Ministry of Education and Culture increased the National Literacy Movement (GLN), which is part of the implementation of Minister of Education and Culture Regulation Number 23 of 2015. Numeracy literacy is one part of literacy in the field of mathematics. Both universities and schools need to improve skills related to mathematical literacy in taking into account the challenges of the 21st century. Schools that implement numeracy literacy obtain positive results on students' reading and writing abilities. The Numeracy Literacy Program must be continued with the help of families and the community so as to produce a young generation who can read and write quickly, and are able to use numbers in solving everyday problems. Numeracy is a person's ability/expertise in using numbers to practically solve various daily problems (Ferianto et al, 2022). This is in accordance with what was conveyed by the G.L. (Widarti, 2019), charts, and so on). Numeracy ability is also the ability to use the interpretation of analysis results to predict and make decisions, which is called numeracy literacy. Mathematical literacy can also be used to solve unstructured problems (Mahmud & Pratiwi, 2019). According to Maulidina, & Hartatik, (2019) students with high mathematical abilities are able to use various

kinds of numbers or symbols related to basic mathematics to solve mathematical problems, are able to analyze information in the form of graphs, tables, charts and others and use this information in solving problems. Improving students' numeracy skills must be fully supported by the school, family and community. According to Darwanto et al (2021),
Students' intellectual abilities in understanding, planning, carrying out and obtaining solutions to various existing problems is the aim of providing mathematical problems for students at school. **in service Teacher Professional Education** (PPG) is education that produces professional teachers. Professional teachers are teachers who master 4 competencies, namely pedagogical, professional, personality and social competencies. Professional competence is competence that is mastery of learning material in a field of study including numeracy literacy. Teacher professional competence is mastery of managing learning in the classroom in a broad and in-depth manner, which includes mastery of school subject curriculum material and the scientific substance of the material, as well as mastery of scientific structure and methodology, one of which is literacy and numeracy skills. To improve students' numeracy skills, professional teachers must also have good numeracy skills

The results of observations and learning surveys in the **in service Teacher Professional Education** PPG class as preliminary research revealed that almost the majority of teachers participating in PPG Daljab were working on LK 1.1 assignments. until LK 1.3 related to problem identification, rarely even no one chose problems related to numeracy literacy. In general, they still have problems with students' low motivation and concentration due to inaccurate selection of learning models, media or teaching materials. This is because the students' ability to receive lessons given by the teacher is influenced by the various factors above, the use of a one-way method where students are only given a link to the material via Google Form. Teachers lack innovation in using learning media so they do not motivate students to learn. Adequate media is one of the supports in helping students understand the material so that they can improve the learning process and outcomes (Arsyad, 2013). However, in schools, media such as handbooks are still not used optimally because during online learning currently schools do not provide textbooks that students can hold. In fact, learning media is something that is very important during the learning process because it is one of the benchmarks for determining the success of learning to help students improve their understanding of the material (Salsabi;a, 2020). Therefore, one effort that can be made is to develop media that can be a learning resource and help students understand the material.

One possible development is the development of e-module learning media (Winatha, et al., 2018). This module is structured systematically in language that is easy for students to understand according to their level of knowledge and age, thus allowing students to learn independently with minimal support or guidance from educators (Suparman, et al., 2018). With this module, students can learn more independently, with or without teacher supervision, depending on their ability, experience and proficiency in the material they have acquired (Lathifah, et al., 2020). One form of presenting digital or electronic learning materials is e-modules (Harta, et al., 2014).The development of e-modules aims to attract students' attention and attention so that they can improve their learning outcomes through structured and organized presentation. With electronic modules, learning activities can be carried out anytime, anywhere (Istuningsih, 2018). E-modules as a learning medium can be used both inside and outside the classroom, giving students the ability to learn skills, especially independently, not necessarily in the classroom (Arsyad, 2013).The advantage of electronic modules is their ability to present material using a combination of media such as audio, text, images and video (Agustina, 2015). Meanwhile, according to Anandari, an electronic module or electronic module is a hard disk, floppy disk, CD, flash disk, or book-style information display that can be displayed and read electronically in the following format: HTML link for computers, smartphones, or e-readers. E-modules are very often used to deepen students' understanding of the learning process (Umbu, 2019).

The module developed in this research is a project-based interactive e-module with a focus on strengthening numeracy literacy. Several similar studies have been carried out by previous researchers, including: Development of E-book Teaching Materials on Accounting Cycle Material for Service Companies as a Support for Scientific Learning for Class , 2020). The Development of E-Worksheet Using Kvisoft Flipbook Maker Software Based on Lesson Study to Improve Teacher's Critical Thinking Ability (Erna, 2021). Development of Physics Flipbook Learning Media to Improve Student Learning Outcomes with research results showing that the flipbook being developed can improve high school student learning outcomes (Hayati, 2015). Based on the description above, the researcher intends to carry out an in-depth analysis regarding the need for e-module development for PPG students who need to strengthen numeracy literacy as one of the competencies that must be possessed by students who are prospective 21st century professional teachers. At this needs analysis stage the researcher collects authentic information related to this need. and whether or not this e-module was developed, a

more in-depth analysis to uncover the causes, low numeracy literacy among **in service Teacher Professional Education** PPG students during phase 1 activities and LK 1.1 to LK 1.3 projects during learning, and determining the root of the problem. This series of analyzes is intended to describe the implementation of learning and its problems in order to develop alternative solutions and recommendations for developing interactive e-modules according to needs. Therefore, this research aims to analyze student needs for the development of project-based interactive learning e-modules to improve the numeracy literacy of **in service Teacher Professional Education** PPG students at FKIP Khairun University by integrating modules into the PPG LMS

II. METHODE

This type of research is qualitative descriptive research which aims to analyze PPG students' needs for interactive e-modules which can facilitate students to improve numeracy literacy. This needs analysis includes analysis of learning implementation, especially projects LK 1.1 to LK 1.3 and analysis of numeracy literacy based on e-module implementation. The subjects in this research were PPG students Batch 2 of FKIP Khairun University in 2023, apart from that it also involved tutor teachers and class instructors as research sources taken based on purposive sampling. Research data was collected through observation of class discussions, limited interviews, and analysis of project products LK 1.1 to LK 1.3 of the PPG curriculum and document analysis sheets for PPG teaching materials. The following instruments used and the objectives of each needs analysis stage are presented in Table 1.

Table 1 Instruments for the e-module development needs analysis stage

Method of collecting data	Instrumen of collecting data	Objective
observation	Observation guidelines	Revealing obstacles encountered by teachers; models, methods and learning resources used in learning; and teacher responses regarding project-based e-module development
Interview	Interview guidelines	Revealing the characteristics of PPG students, perceptions of PPG students regarding the use of e-modules in learning at school
Analysis of teaching material products	Document analysis sheet	Analyze the suitability of learning objectives and learning tools used by PPG teachers/students

The results of the needs analysis are used as a basis for formulating recommendations for project-based e-module development. These recommendations include material aspects, media aspects and language aspects.

III. RESULT AND DISCUSSION

The needs analysis aims to collect information regarding the problems found in **in service Teacher Professional Education (**PPG) Phase 1 learning, analyze problems and their root causes, implementation of learning and obstacles that occur, use of e-modules and their shortcomings, identify suitability, breadth, depth, adequacy and curriculum, and reformulate indicators and coverage of material needed to achieve learning indicators. The results of the needs analysis are used as a basis for determining alternative solutions and recommendations for e-module specifications that must be developed.

At this stage, it is known that **in service Teacher Professional Education** PPG students have difficulty understanding learning material related to numeracy literacy. This can be seen through the results of work on LK 1.1 to LK 1. 3. The percentage of students who chose the numeracy literacy theme as the material chosen in working on LK 1.1 to LK 1.3 is still very low when compared to other themes such as motivation, learning models and learning media. The results of the analysis of knowledge and experience in implementing numeracy literacy-based learning are presented in Figures 1, 2 and 3 below:

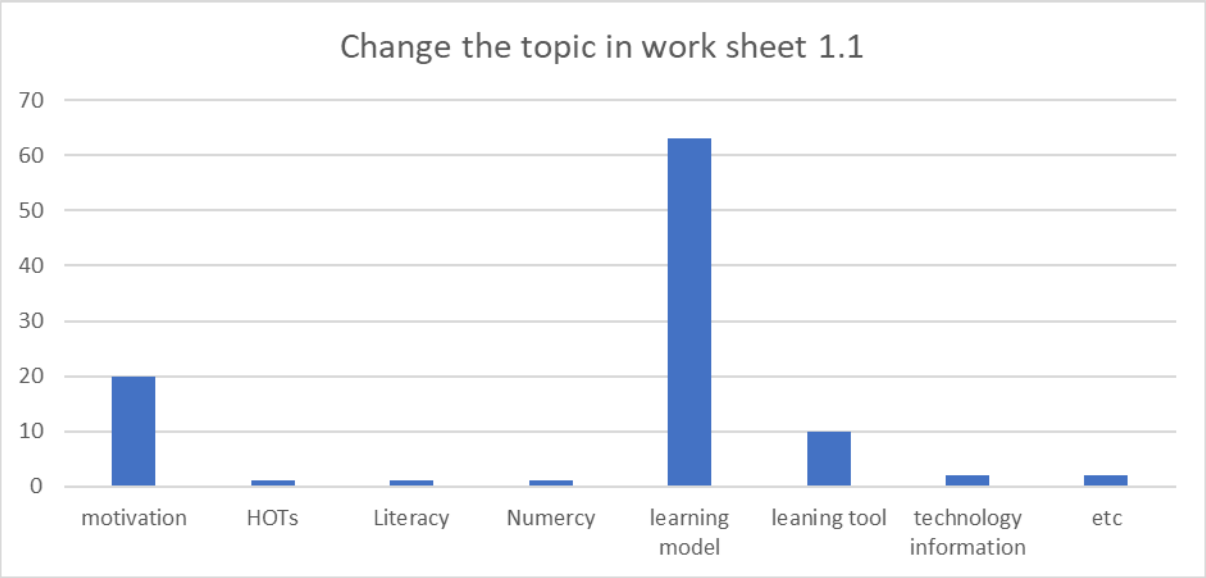

Fig 1. Percentage of problem identification topic choices on Worksheet 1.1

Based on the graphic analysis above, it can be seen that very few PPG students in positions choose literacy and numeracy topics in worksheet assignment 1.1. Next, the results of the analysis of the use of ICT-based learning media for PPG students in positions are as shown in Figure 2.

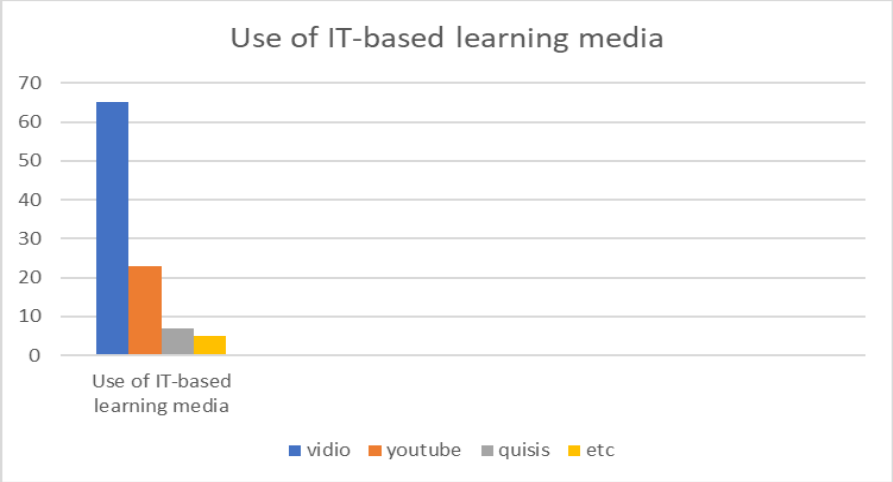

Figure 2. Use of IT-based learning media for in-service PPG students

From the results of interviews with teachers conducted with in-service PPG students, information was obtained that PPG students in their positions as teachers at school used more video as an IT-based learning medium. Teachers still tend to use semi-conventional interactive learning methods because they are considered more effective, but knowledge about literacy and numeracy is still very minimal with the choice of video media.The choice of semi-conventional interactive learning methods was related to problems with teachers' limited abilities in mastering technology, managing classes and limited technology-based teaching materials (Tondeur, 2017). Furthermore, the results of the analysis of literacy and numeracy skills in in-service PPG students before and after the interactive discussion on Worksheet 1.1 are as shown in Figure 3 below:

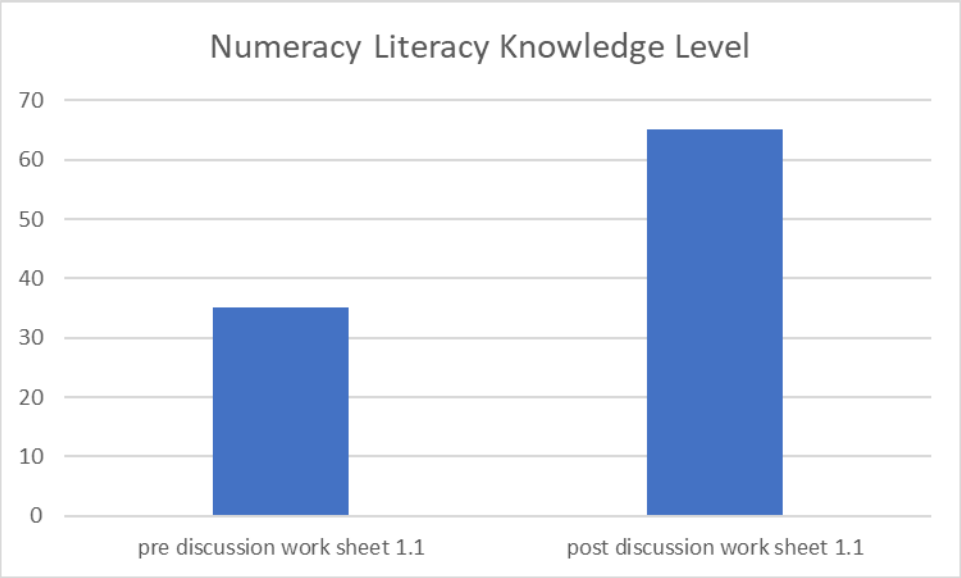

Figure 3. Level of knowledge of in-service PPG students regarding literacy and numeracy

Analysis of interview results is useful for obtaining information about the problems experienced by students and the product needs that students want. This development needs to be carried out because it appears that there is no specific e-module to make it easier for PPG students to work offline with the LMS. This is reflected in the results of the needs analysis carried out on 20 PPG students in positions for the 2023 academic year. The following recapitulation of the results of the analysis of student needs in developing project-based e-module products can be seen in Figure 4.

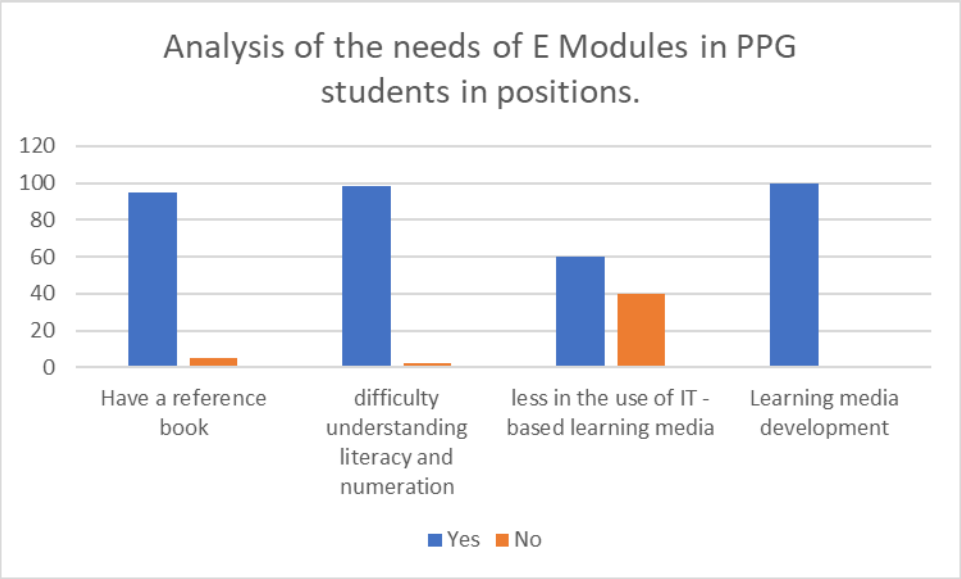

Figure 4: Analysis of e-module development needs

Based on the results of data analysis in Figure 4 above, it can be seen that the development of e-modules is very much needed by PPG students in their positions, although in general students already have reference books, e-modules can provide interactive tutorials to students offline with LMS, especially on literacy strengthening material and numeracy.

IV. DISCUSSION

The results of this research are in line with Arsyad, 2013 which states that in-service PPG teachers or students are required to be able to develop skills in creating learning media that they will use if the media is not yet available.The aim of developing e-modules is to attract students' interest and attention so that they can improve learning outcomes through structured and organized presentation. By using e-modules, learning activities can take place anywhere and at any time (Istuningsih, 2018). E-modules as a learning medium can be used both in the classroom and outside the classroom so that students can develop their abilities, especially the ability to learn independently, not necessarily in the classroom (Arsyad, 2013).

The advantage of electronic modules is that they can present material with a combination of media such as audio, text, images and video (Agustina, 2015). Electronic modules or e-modules are information displays in book format that are presented electronically using a hard disk, diskette, CD, flash disk, or in the form of an HTML link and can be read using a computer, smartphone or electronic book reader (Anandari, et al., 2019). E-modules are very good for increasing students' understanding in the learning process (Umbu, 2015).Based on the results of the literacy and numeracy competency analysis of teachers who are PPG students in positions at FKIP Khairun University. Furthermore, Mahmud et al (2019) define literacy as the ability to read, write and think critically, while numeracy is defined as the ability to identify, understand and use mathematical sentences in various forms of life (Adeyemi and Adaramola, 2014). From this, numeracy literacy can be interpreted as the ability to read, understand, identify and think critically in using mathematics in various areas of life. Literacy and numeracy skills are the basis for students to understand material before continuing to the next level (Kovas et al, 2013). This ability is not only used in solving problems given by teachers at school, but is also used in solving problems in everyday life (Grasby et al, 2020).

It can be further explained that good numeracy literacy skills can be seen through the skills or abilities proposed by Han et el (2017), namely (1) using various kinds of numbers and basic mathematical symbols to solve practical problems in everyday life, (2) analyzing information presented in charts, tables, graphs, and so on, (3) using interpretation of analysis results to predict and make decisions, but can also be seen through indicators of numeracy literacy skills based on Ambarwati and Kurniasih (2021), namely (1) working effectively with models in concrete and complex situations (2) selecting and representing information, including symbols, and connecting it with real situations (3) using skills and reasoning with various knowledge in the immediate context and (4) providing explanations and communicating them accompanied by reasons and arguments based on interpretation and actions taken. Based on several opinions, it can be concluded that indicators of numeracy literacy ability consist of (1) working effectively in solving practical problems using skills and reasoning with various knowledge (2) using models, symbols and numbers in solving real problems (3) being able to analyze the data presented in in the form of charts, tables, graphs, etc. and (4) interpreting the results of the analysis to make decisions by providing clear explanations and arguments.

V. CONCLUSION

Based on the results of the needs analysis, the researcher recommends developing a project-based interactive e-module to increase the numeracy literacy of in-service PPG students. This is to simplify the learning process when implementing PPG training which is carried out online based on LMS. Project-based interactive e-modules are expected to be a solution for in-service PPG teachers and students at FKIP Khairun University.

ACKNOWLEDGEMENTS

Thank you to PPG FKIP Khairun University for providing research funding through the 2023 LPTK Revitalization research incentive.

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