Development of E-Module "Community Needs Analysis" Based on *Massive Open Online Course* (MOOC) : Learning Innovation for Community Practitioners

**Rakhmaditya Dwi Noorrizki*, Alfina Nur Azri, Anjarie Dharmastuti,
Ikhwanul Ihsan Armalid**
Psychology, Universitas Negeri Malang, Indonesia.
*Corresponding Author. Email: rakhmaditya.dewi.fppsi@um.ac.id

Abstract: The purpose of this study was to develop a Massive Open Online Course (MOOC)-based community needs analysis e-module to improve understanding of problem-solving and community empowerment. This research used the Research and Development (R&D) method with the Four-D model (Define, Design, Develop, Disseminate). The subjects for validity, effectiveness, readability, and quality tests were content experts, material experts, and media experts. The data analysis technique used was descriptive quantitative. The material expert validity test used Aiken's V validity test analysis and Borich reliability. The validity test results obtained were 0.977 or 97.5%. The media expert validity test obtained a result of 0.844 or 84.4%. The Readability and Ease of Navigation test obtained a result of 1 or 100%. The Interactive and Feedback Quality Test obtained a result of 0.822 or 82.2%. The Media Effectiveness Test in Supporting Learning obtained a result of 0.977 or 97.7%. The results of this study indicate that the community empowerment e-module on the MOOC platform is suitable for use in communities to increase understanding of problem-solving and community empowerment training.

Introduction

Social problems in Indonesia have certainly become the daily conversation in people's lives. Ranging from the occurrence of economic disparities to inequality in access to education and health. Data shows a high poverty rate with around 9.22% of the population still below the poverty line in 2022 (BPS, 2022). In addition, the number of unemployed people in Indonesia also reached 5.32% (BPS, 2023), which of course if this figure continues to grow from year to year, it can cause concern for the welfare of the community. In addition to these social and economic problems, health problems also require attention. This is because in 2022 it was found that 21.6% of toddlers were indicated to be stunted, and there were 1 in 10 people in Indonesia who experienced mental disorders (Satya, 2023). Furthermore, the education sector faces equally complex challenges. These challenges require a holistic approach that extends beyond government agencies and necessitates active community participation.

Considering the urgency of problem solving for community life, of course, there is a need for quick and appropriate solutions. The active and participatory role of community members themselves will produce more meaningful and lasting solutions (Kinyata & Abiodun, 2020). The problem is that there are limited sources of information on how community members can change their own communities. Currently, many community problems are solved through government initiatives such as the Family Hope Program (PKH) (Asian Development Bank, 2016); National Program for Independent Community

Empowerment (PNPM Mandiri) (Centre For Public Impact, n.d.); Indonesia Pintar Program and several other programs. However, it is not uncommon for these government programs to be misdirected and therefore ineffective. Many community members themselves are unaware of the programs and the procedures for applying for them. The lack of problem-solving initiation from the community can also be caused by a lack of knowledge, active role, and experience from the community. Many community members tend to just wait for solutions from the government or other parties who are considered more capable of overcoming the problem. Not only that, when solutions and empowerment programs have been provided to community members, it is not certain that the program will run well. When there is no intense assistance and the program is delegated to the community so that it can be managed independently, the program will be difficult to run and not implemented. Whereas the initiative and active role independently from the community is needed for the progress of the community in the future.

Active community participation in problem solving has been widely practiced by various disciplines. In psychology, the discussion of the community has been summarized in the concept of community psychology. Where community psychology seeks to understand the improvement of the quality of life of individuals, communities and society, which is not only focused on individuals and the environment, but also on the relationship between the two (Widiningsih et al, 2018). According to the principles of community psychology, community empowerment is key in dealing with complex social problems (Nasution, 2021). With empowerment, the community will be directed to be able to identify resources both external and internal to be utilized to improve welfare (Prilleltensky & Nelson, 2002). Through collaboration and active participation, communities can identify, plan, and implement initiatives that have been tailored to their own needs and goals (Kamuli et al., 2023). Of course, each member has the potential to become a change agent in community empowerment (Coy et al., 2021). By presenting data that shows the active participation of the community in making decisions on the problems they face, it can increase the effectiveness of community empowerment programs (Ani et al, 2017; Coy et al, 2021; Pigg, 2002; Putnam, 2000).

This community empowerment effort can be done optimally if it can analyze community problems in depth. One way to dig deeper into these community problems is by using a community needs assessment. This assessment is carried out to gain a deeper understanding of the core problems of the community as the key so that this community empowerment program can be right on target (Flint, 2013). A community needs assessment is a systematic process to identify and analyze the needs, problems, and resources of a community (Minkler et al., 2003). Using this needs assessment can enable in-depth and even comprehensive identification of problems regarding the situation and conditions of the community, so that empowerment programs can be designed and implemented effectively.

Based on previous research, community empowerment efforts can increase the participation of community members and the community in making decisions and solutions and implementing sustainable economic development programs (Asnuryati, 2023). In research Zukhra et al (2024) mentioned an increase in digital literacy in the community after digital literacy empowerment, there was a 60% increase in literacy for students and the community. But in fact the problem of empowerment arises from the community members themselves, where community members even though they realize there is a problem, they don't understand what to do, where to start, and who to ask for help. To find out more about the community's problems, interviews were conducted with two residents and two field

officers. Based on excerpts from interviews with residents and field officers, it was found that community members wanted to solve the problem, but they did not know where to start and how. This is due to their limited knowledge of community empowerment procedures. As for the field officers in charge of the community, they feel that the training provided by the government is still rarely carried out, so it lacks updates. Ease of access to materials is also a problem for community practitioners to increase their knowledge. Therefore, innovations are needed that can increase community empowerment and knowledge with a very broad scope without being limited by place and time.

By looking at the problems of community empowerment, efforts are needed in optimizing community empowerment, namely by using digital media. The use of digital media is considered appropriate because it can broadly reach existing communities without being limited by space, time and age. Given that in the era of digitalization as it is today, almost all areas of life utilize digital media. This digital media is expected to include various understandings related to the community, problem solutions, and empowerment training. One of the digital media that is considered appropriate to use at this time is digital modules or better known as e-modules.

E-modules or digital modules are digital media used to assist the learning process using an electronic-based system that contains material in the form of writing, images or animations, evaluations, graphics and videos (Erdi & Padwa, 2021). The use of this e-module is considered appropriate because of its easy access to use anywhere and anytime. The use of this e-module can later help the community in learning about community problems and other empowerment materials. This e-module will later be packaged in *Massive Open Online Course* (MOOC) content. This MOOC e-module is a distance learning process module where all activities are carried out online (Alghifari, 2020). By using the *Massive Open Online Course* (MOOC) e-module that has been tailored to the concept of community assessment, it is an effective means of reaching individuals who want to be actively involved in addressing social problems in their community. This e-module will be tailored to the Community Needs Analysis that provides access to anyone interested in making positive changes in their neighborhood, by providing an in-depth understanding of the concepts and practices of community needs assessment (Bonk & Khoo, 2014).

In recent years there have been studies that provide positive results related to the development of e-modules in various fields. The research was conducted by Erdi & Padwa (2021) stated that the use of E-modules as learning media is quite good and feasible to use, students are also more interested in using this e-module than printed modules and are more effective in its use. In research Laraphaty et al (2021) the development of e-modules and learning media is needed. The application of e-modules in the learning process is very helpful for students in independent learning. In this study, the application of e-modules can also help increase student interest in learning as evidenced by the average percentage of validity, practicality and effectiveness with a value of 85%, which means it is in very good and feasible criteria. In research Alghifari (2020) which developed MOOC course modules in academic activities and academic courses resulted in the usability of MOOC course modules of 75% from the perception of institutional users, which means that the use of MOOC course modules to manage academic programs, academic courses, and professional courses is not satisfactory but still accepted. From the tutor user's perception of 70%, which means that the management of course materials and discussions is still not satisfactory but still acceptable. From the user student's perception of 78% which means that participation in courses and discussions is still not satisfactory. From the results of testing the use of participants by 70%

which means that there is ease in the process of courses and discussions that make participants able to complete the course.

Based on the results of previous research, many of these studies have developed e-modules in the field of education. But very few studies have developed e-modules for the social field. So it is deemed necessary to develop e-modules in the social field, especially in community needs analysis. This development was carried out to facilitate the general public, especially the community, in increasing their knowledge related to community problem solving and community empowerment, which they still lack. Unlimited access to place and time on the course is also very helpful for them. In addition, the purpose of this research is to develop a product in the form of an e-module with a complete course packaged in MOOC content in the form of learning plans and tools that have been adapted to the concept of community needs assessment.

Research Method

The method used in this research is *Research and Development* (R&D). The R&D method is a method used in creating an innovation, either new or the development of an innovation that has been found to be more interesting and adjusted to the objectives of various specific research topics (Muqdamien et al, 2021). By using data collection techniques, namely providing validity assessment sheets to experts in e-module content, namely three material experts, three media experts, three experts on readability and ease of content navigation, and three assessors of interactive quality and feedback.

Data analysis techniques in this study used descriptive quantitative and qualitative. To analyze the validity of this research using Aiken's V validity test analysis and Borich reliability (1994) to see the similarity of perceptions and the level of agreement between expert validators. The procedure for developing this e-module has been adjusted from the *Research and Development* R&D model with the flow of the Four D device development model expressed by Thiagarajan et al (1974). This model has four stages, namely *Define*, *Design*, *Develop,* and *Dissemination*. The use of the Four D model has the advantage that it does not require a long implementation time because the stages are not too complicated (Johan et al, 2023). The following is the flow of the development stages of the Four D model:
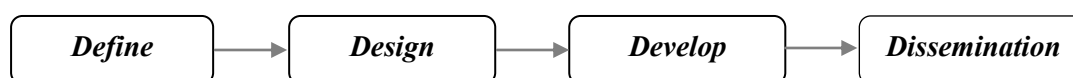

Figure 1. Flowchart of the Development Process

a) *Define*

The defining stage is carried out to determine the purpose of the product to be developed, explain the needs, conduct a survey of development needs and targets, and gather information about the innovation to be developed. And at that stage the researcher can also formulate the main solution for the next step.

b) *Design*

This stage aims to make the design of the initial MOOC e-module framework. This design stage consists of:

1) Determine the objectives and community empowerment materials that will be contained in the MOOC e-module.
2) Designing the e-module structure, selecting learning media and story board
3) Develop a learning media format that is tailored to the MOOC content. Such as Course, Video *explainer* and *motion graphic*, and Training.

4) Creation of assessment tools such as quizzes, learning evaluations, and learning assessments.

c) *Develop*

The following stage aims to create new innovations that will be developed, namely e-modules. Prototypes of the product began to be made and tested. With the following stages:

1) Conduct validity tests and reviews from expert judgment to assess the suitability and feasibility of materials, learning media, and exposure videos on e-modules before testing. This expert validity value will later be used to revise the e-module

2) After the value of the expert validity test results comes out, it can be used as a reference for product revision, this revision is used to get better results in accordance with the direction of the expert.

3) Furthermore, after passing the revision stage and the prototype is considered feasible, a limited trial will be carried out in order to determine the results of the application of the e-module in the community environment.

d) *Disseminate*

After going through the process of expert assessment, prototype revision, and limited testing and deemed suitable for use in the general public, the e-module is ready to be disseminated among the community. This research will only implement limited dissemination, namely only disseminating e-modules to practitioners, community facilitators, and social communities within the State University of Malang.

Results and Discussion

The development of e-modules on the MOOC platform that has been adjusted to the community needs assessment is based on the problem of community empowerment that arises from the community members themselves. As an effort to overcome this problem, the development of e-modules containing learning content that has been adapted to the assessment of community problems that can be used anywhere and anytime. There are four stages in this development model, namely Define, Design, Develop, and Dissemination

The first stage is analysis and *definition*. At this stage, the main focus is to analyze learning needs and understand the context in which the e-module will be used. At this stage of the research, several things are carried out, namely, development needs analysis, user analysis, and material needs analysis. Development needs analysis aims to identify problems or knowledge gaps related to community needs analysis which is the basis for module development. At this stage, researchers conducted surveys or interviews with community practitioners. From the data collection, it was found that there is a great need to provide structured and online-based learning materials for the topic of community needs analysis.

The next stage is user analysis. This stage aims to analyze the characteristics of potential users, such as students or community practitioners who will use the MOOC. From this stage, data is obtained including their initial level of understanding of the topic, previous experience with online courses, and learning media preferences.

Figure 2. Bar Diagram of Understanding the Material

Figure 3. Circle Diagram of Experience with Online Courses

Figure 4. Bar Diagram of learning media preferences

Based on the results of the analysis on prospective users, it was found that prospective users have a wide variety of understanding of the material ranging from very not understanding to very understanding. A total of 57.1% of potential users have already attended online courses and videos and handouts are dominantly chosen as learning media. The last analysis conducted is the analysis of learning tasks and materials. This stage aims to determine the expected core competencies, learning objectives, and what material should be delivered in this e-module. The results of this analysis are outlined in the learning plan document.

Figure 5. Lesson Plan

The second stage is the *design* stage. In this research, the design stage focuses on creating the initial framework of the e-module, including the planning of content, media, and assessment components. The steps taken include the design of the e-module structure, selection of learning media, and preparation of storyboards for learning media. The module structure design stage aims to arrange the e-module material based on the results of the needs analysis, with the division of the module into several main sections, such as introductory theory, case studies, and interactive exercises. Each module is designed to provide material in stages, with a clear end goal. In addition to the material content of the e-module, because this is an interactive e-module, it will be accompanied by learning media that supports user understanding. At the learning media selection stage, the development team agreed to choose the media to be used, namely *explainer* videos and *motion graphic* videos. The explainer video and *motion graphic* video are used to explain the concept visually, while the quiz is used as a formative evaluation tool. The last stage is *storyboarding*. At this stage the development team in collaboration with the multimedia team compiled media content, storyboards for videos. Visual design concepts are prepared for a clear flow, and in accordance with the learning objectives

The third stage is *development*. At this stage, the content that has been compiled in the previous stage begins to be produced and tested. So this stage includes the development of teaching materials and expert validation. At the teaching material development stage, all teaching materials such as e-modules (including quizzes, and interactive exercises) and explainer videos, are developed in line with the design that has been prepared. The experts who validate the module are *subject matter experts* to check the quality of the content, and media experts to ensure the effectiveness of the delivery and attractiveness of the media used.
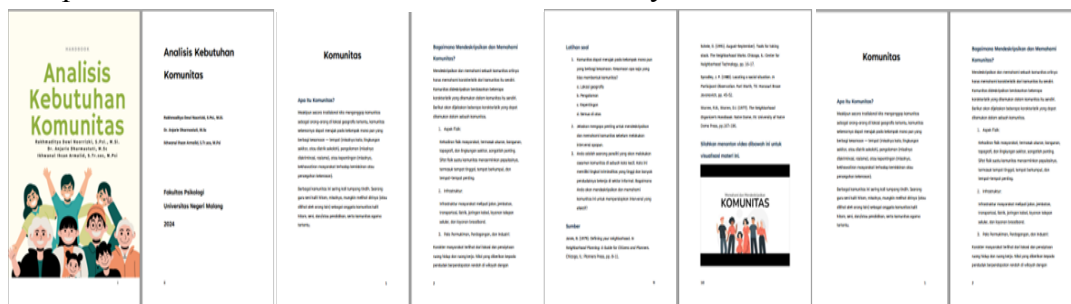

Figure 6. Content of the E-modul

Before conducting the e-module trial, it is necessary to conduct a validity test by experts. This validity test uses Aiken's V index analysis (1985) and Borich's perception similarity test (1994) which is explained in the following table.

Table 1. Material Expert Validity Results

Aspect	Expert			V	Ket.
	I	II	III		
1-10	40	40	38	0,977778	High

Based on the table, the results of the overall material expert validity test show a value of 0.977 or at a high criterion level. This means that the aspects measured in the validity of the e-module material related to empowerment and problem solving in this community are suitable for use to support community understanding. In addition, the validity test using Borich's theory obtained a result of 97.5%, which means that there is a strong perception similarity between experts.

Table 2. Media Expert Validity Results

Media Expert Validity Results				
Aspect	Expert		V	Ket.
	1	2	3	
1-5	18	19	16	0,844444	High

Based on the table, the results of the overall media expert validity test show a value of 0.844 or at a high criterion level. This means that media aspects such as the appearance and visuals of this e-module are suitable for use in supporting community empowerment learning. The results of the validity test on Borich's theory also show a value of 94.1%, which means that there is a fairly good common perception from the experts regarding the feasibility of the media contained in this e-module.

Table 3. Readability and Ease of Navigation Results

Readability and Ease of Navigation Results				
Aspect	Expert		V	Ket.
	1	2	3	
1-5	20	20	20	1	Very High

Based on the table above, the results of the overall readability and ease of navigation test show a value of 1 or at a very high criterion level. This means that the navigation icons in this e-module function very well, the division of segments is easy to access, and the navigation flow is easy to understand so that it can be said to be suitable for use in supporting community empowerment learning. The results of the validity test on Borich's theory also show a value of 100% which means that there is a high similarity of perceptions from experts regarding the readability and ease of navigation contained in this e-module.

Table 4. Interactive Quality and Feedback

Interactive and Feedback Quality Results				
Aspects	Expert		V	Ket.
	1	2	3	
1-5	19	17	16	0,822222	Very High

Based on the table above, the results of the interactive quality test and feedback show a value of 0.822 or at a high criterion level. This means that the interactivity of the material contained in this e-module is able to help improve understanding in solving community empowerment problems. In addition, the use of quizzes, simulations, and feedback is also considered very useful and can help learning so that it can be said to be feasible to use in supporting community empowerment learning. The results of the validity test on Borich's theory also show a value of 91.4%, which means that there is a good common perception from experts regarding the readability and ease of navigation contained in this e-module.

Table 5. Effectiveness of Media in Supporting Learning

Results of Media Effectiveness in Supporting Learning				
Aspects	Expert		V	Ket.
	I	II	III	
1-5	20	20	19	0,977778	High

Based on the table above, the results of the media effectiveness test in supporting learning show a value of 0.977 which is included in the high category. This means that the media facilities and multimedia content contained in this e-module are very effective and help support the learning process and understanding in solving community empowerment problems. So it can be said to be feasible if used in supporting community empowerment learning. The results of the validity test on Borich's theory also show a value of 97.4%, which

means that there is a fairly good common perception from experts regarding the effectiveness of the media in supporting the learning contained in this e-module

Based on the overall results of data tabulation, it shows a fairly high feasibility value on various aspects measured in the e-module. The results of *Aiken's V* validity show a range of values from 0.8 - 1 which is in the high to very high criteria. This is in accordance with the Aiken's V validity test criteria where it is declared high if the validity has a value of ≥ 0.30 (Azwar, 2014). Likewise, the reliability results of Borich (1994) show a value of 91.4% - 100% or means that there is a fairly good similarity of perception of all aspects measured from experts. This explanation is in accordance with the explanation of Verawati et al (2022) where when the *percentage of agreement* value is ≥ 75% or R = ≥ 0.75. So it can be interpreted that the aspects of the various criteria assessed in the e-module are quite good and feasible to be applied and developed further. The problem empowerment material in the e-module is also considered feasible and easy to learn. The media display, segment division and content in the e-module are also quite good and easy to understand the flow, as well as navigation icons that can function properly. Providing feedback and quizzes is also considered sufficient to facilitate the provision of understanding for e-module users.

After going through the analysis of expert validity test, readability test, interactive quality test, and media effectiveness test, it can be continued at the *Dissemination* stage, where the developed and tested module is ready to be launched widely. The first thing to do is to distribute through the MOOC platform. E-modules are published through the MOOC platform that has been prepared. What has not been done in this development is monitoring and evaluation because the MOOC class has not yet received students so they have not received *feedback on* the implementation of the course. Feedback will be obtained after the MOOC class is opened.

Based on the results of e-module development research with community problem empowerment material that has been adapted to community needs analysis using the *Massive Open Online Course* (MOOC) platform that has been carried out, as well as the results of validity testing by several experts, the results show all categories with very good values. This is in line with the statement of Alsina et al, (2018) which explains that the success of a lesson must be supported by the existence of learning media that has met the validity and reliability testing criteria. The validity of teaching materials is very important to ensure meaningful learning (Kurnisar et al, 2022). The results of the study are also in line with the statement Morrison et al, (2020) which shows in terms of material, e-modules have been adapted to the needs of communities that are relevant to use in learning.

Readability and navigation also scored high, indicating that the module provides effective interaction between learners and the material, and provides useful feedback. Both elements, interaction and feedback, are important elements that need to be owned by technology-based learning (Kyei-Blankson et al, 2016). Overall, the results of this study show that MOOC-based e-modules for community problem empowerment are feasible. This is in line with research conducted by Achya et al, (2022) who conducted research on the development and implementation of MOOC on *certificate* and *ceremony* modules where the research shows that each aspect assessed gets pretty good results, so it is considered feasible to use and can help make it easier because it is more efficient distance and time.

The utilization of MOOCs makes it easy for learners to access flexibly, which very beneficial for community empowerment that requires continuous training but has limited access to formal learning (Ismail, 2020). The application of e-modules can also encourage and help students to learn independently (Laraphaty et al, 2021). This shows that the use of

MOOC e-modules in social communities can increase community independence in overcoming their own problems.

Conclusion

The study yielded significant validity test results across multiple aspects. The material expert validity test showed a value of 0.977 with a PA (Percentage Agreement) value of 97.5%, while the media expert validity test resulted in 0.844 with a PA value of 94.1%. The readability and ease of navigation test demonstrated a validity value of 1.0 with a PA value of 100%. The Interactive Quality and Feedback test showed a validity of 0.822 with a PA value of 91.4%, and the Media Effectiveness test in Supporting Learning yielded a validity result of 0.977 with a PA value of 97.4%. Validity values exceeding 0.8 indicate very high validity criteria, while PA values above 75% demonstrate strong perception alignment and high agreement levels among experts. Based on these validity test results and PA values, the developed e-module for community problem empowerment using the MOOC platform is deemed suitable for community implementation. The e-module effectively increases community understanding of problem-solving and empowerment training, offering easy accessibility without spatial or temporal constraints.

Recommendation

Future research should focus on evaluating e-module trial results to optimize community implementation. Practitioners are encouraged to establish specialized communities with fellow practitioners for collaborative study and further e-module development. Additionally, community facilitators should study and enhance this e-module to improve their delivery of empowerment training to community members.

Acknowledgments

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