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## MOOCS as a Flexible Learning Innovation in the Literacy Program Development Course

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### Abstract:

*The rapid digital transformation in higher education has increased the demand for flexible learning models that enhance students' digital competencies and independent learning. Although Massive Open Online Courses (MOOCs) have been widely implemented in higher education, empirical evidence regarding their application in Non-Formal Education, particularly in Literacy Program Development courses, remains limited. This study aims to analyze the implementation of MOOCs as a flexible learning innovation and examine their influence on students' learning flexibility, participation, learning motivation, learning effectiveness, and digital literacy. A quantitative descriptive approach employing a survey design was used. The participants consisted of 56 undergraduate students enrolled in the Literacy Program Development course in the Non-Formal Education Study Program at the University of Bengkulu during the 2023/2024 academic year. Data were collected through questionnaires, observations, documentation, and limited interviews and analyzed using descriptive statistical techniques. The findings indicate that MOOCs provide significant benefits by increasing learning flexibility (90.5%), digital literacy (89.5%), learning motivation (86.0%), learning effectiveness (86.0%), student participation (85.5%), and platform usability (85.0%). Students perceived that MOOCs enabled them to access learning resources anytime and anywhere, promoted independent learning, facilitated collaborative interaction, and strengthened digital competencies. Nevertheless, challenges related to internet connectivity and students' readiness for self-directed learning were still identified. This study contributes empirical evidence on the implementation of MOOCs within the context of Non-Formal Education and demonstrates that MOOCs constitute an effective technology-enhanced learning innovation for supporting flexible learning and digital transformation in higher education.*

**Keywords:** Digital Literacy, Flexible Learning, Higher Education, Non-Formal Education, Open Online Courses (MOOCs), Technology-Enhanced Learning.

## INTRODUCTION

The rapid advancement of digital technology has fundamentally transformed higher education, encouraging universities to adopt more flexible, student-centered, and technology-enhanced learning environments. The integration of digital learning platforms has become increasingly important in supporting lifelong learning, improving accessibility, and fostering students' digital competencies required in the twenty-first century. Following the post-pandemic educational transformation, higher education institutions are expected not only to digitalize learning resources but also to redesign learning experiences that enable students to learn independently regardless of time and location (Bond et al., 2024; UNESCO, 2023). Consequently, flexible learning has become one of the primary indicators of educational quality in contemporary universities.

One of the most widely implemented innovations supporting flexible learning is the Massive Open Online Course (MOOC). MOOCs provide open access to learning materials, interactive multimedia, discussion forums, online assessments, and collaborative learning opportunities through digital platforms. Previous studies have demonstrated that MOOCs can improve learning flexibility, increase learning motivation, promote self-directed learning, and enhance digital literacy among university students (Martin et al., 2020; Kaplan & Haenlein, 2016; Alraimi et al., 2015). Furthermore, MOOCs align with constructivist and connectivist learning theories, emphasizing active knowledge construction through digital interaction and collaborative learning networks (Siemens, 2015).

In Indonesia, the implementation of MOOCs has expanded considerably following the acceleration of digital transformation in higher education. Government policies promoting digital learning and the Merdeka Belajar

curriculum have encouraged universities to integrate online learning systems into various academic programs. However, despite this development, the implementation of MOOCs remains uneven across disciplines. Many courses still utilize learning management systems merely as repositories for teaching materials rather than as comprehensive environments that facilitate active learning, collaboration, and competency development (Belawati, 2019; Dhawan, 2020). Consequently, empirical evidence regarding the effectiveness of MOOCs in supporting specific disciplinary learning outcomes remains limited.

The Literacy Program Development course in the Non-Formal Education Study Program requires students to master not only theoretical concepts of literacy but also practical competencies in designing community-based literacy programs supported by digital technology. Modern literacy extends beyond conventional reading and writing abilities to include digital literacy, information literacy, media literacy, and technological literacy necessary for solving contemporary societal problems (UNESCO, 2023). Therefore, learning approaches employed in this course should facilitate flexible access to learning resources while simultaneously developing students' digital competencies and independent learning skills.

Previous empirical studies have consistently reported positive impacts of MOOCs on learning flexibility, student engagement, motivation, and academic achievement (Martin & Bolliger, 2018; Bozkurt et al., 2017; Hew & Cheung, 2014). More recent studies have also emphasized the contribution of MOOCs to improving digital competence, self-regulated learning, and collaborative knowledge construction in higher education (Bond et al., 2024; Zawacki-Richter et al., 2023; Tlili et al., 2023). Nevertheless, these studies predominantly focus on general higher education contexts, engineering education, business education, or large-scale online learning environments. Very limited research has specifically investigated the implementation of MOOCs within Non-Formal Education programs, particularly in courses emphasizing literacy program development and community empowerment. In addition, previous studies have rarely examined how MOOCs simultaneously influence learning flexibility, student participation, learning motivation, learning effectiveness, and digital literacy within a single instructional context.

This limitation indicates a significant research gap. Although MOOCs have been widely acknowledged as effective digital learning platforms, empirical evidence regarding their implementation in Non-Formal Education remains insufficient. Considering that Non-Formal Education emphasizes flexibility, lifelong learning, and community empowerment, understanding how MOOCs support these characteristics is essential for designing more effective digital learning strategies. Furthermore, evidence derived from the Indonesian higher education context is still relatively scarce compared with studies conducted in developed countries, indicating the necessity for context-specific investigations.

Therefore, this research is urgently needed to provide empirical evidence regarding the implementation of MOOCs as a flexible learning innovation in the Literacy Program Development course of the Non-Formal Education Study Program at the University of Bengkulu. Specifically, this study aims to analyze the implementation of MOOCs and examine their influence on students' learning flexibility, participation, learning motivation, learning effectiveness, and digital literacy. The findings are expected to enrich the literature on digital learning innovation in non-formal education while providing practical recommendations for lecturers and higher education institutions in designing more effective, flexible, and student-centered technology-enhanced learning environments.

## RESEARCH METHODOLOGY

This study uses a quantitative approach with a quantitative descriptive research type. The quantitative approach was used because this study aims to obtain an empirical picture of the implementation of Massive Open Online Course (MOOC) as a flexible learning innovation in the Literacy Program Development course for Non-Formal Education students at the University of Bengkulu. According to Creswell (2018), quantitative research is a research method used to test certain theories by examining the relationship between variables using research instruments and analyzed through numerical and statistical data. In this study, a quantitative approach was used to measure student responses to the use of MOOCs in learning and to determine the level of flexibility, participation, and learning experience of students during MOOC-based learning.

The research design used was a survey with a cross-sectional approach. According to Sugiyono (2022), survey research is research conducted to obtain data from a specific population using instruments in the form of questionnaires. The cross-sectional approach was used because data collection was conducted over a specific period of time without any experimental treatment. This study focused on collecting data on students' perceptions and experiences regarding the use of MOOCs in Literacy Program Development learning.

The research was conducted in the Non-Formal Education Study Program, Faculty of Teacher Training and Education, University of Bengkulu. The research location was chosen because the Literacy Program Development course in the study program has implemented MOOC-based learning as part of digital learning innovation. The research was conducted in the even semester of the 2023/2024 academic year for approximately four months, from February to Juni 2024. The research stages included instrument preparation, initial observations, data collection, data analysis, and preparation of the research report. The population in this study were all students of the Non-Formal Education Study Program of the University of Bengkulu who took the Literacy Program Development course in the even semester of the 2023/2024 academic year. The total population of the study was 56 students consisting of 29 class A students and 27 class B students. According to Arikunto (2019), if the population is less than 100 people, the entire population can be used as research subjects. Therefore, the sampling technique used in this study was total sampling or saturated sampling, namely a sampling technique by using all members of the population as research samples. Thus, the total sample in this study was 56 students.

The research subjects consisted of students actively participating in MOOC-based learning in the Literacy Program Development course. These students had participated in the learning process using the MOOC platform, which included accessing learning videos, participating in online discussion forums, completing online quizzes, submitting digital-based assignments, and engaging in learning interactions through the online platform. The selection of research subjects was based on the consideration that these students had direct experience in using MOOCs and were therefore able to provide relevant information regarding the implementation of MOOC-based learning.

This study employed several data collection methods, including observation, questionnaires, documentation, and limited interviews. The use of multiple data collection techniques was intended to obtain more comprehensive data regarding the implementation of MOOCs in learning. Observation techniques were used to directly observe the MOOC-based learning process in the Literacy Program Development course. Observations were conducted throughout the learning process to assess student activity in using the MOOC platform, student participation in discussion forums, student activity in accessing learning materials, and student interactions during online learning. Observations were conducted in a non-participatory manner, where the researcher was not directly involved in the learning activities but only observed the ongoing learning process. According to Moleong (2021), observation is a data collection technique carried out through direct observation of research objects to obtain information about the behavior and activities of research subjects.

In addition to observation, the primary technique in this research was the use of a questionnaire. The questionnaire was used to obtain data regarding students' perceptions of the use of MOOCs in Literacy Program Development learning. The questionnaire was structured using a Likert scale with five response options: strongly agree, agree, somewhat agree, disagree, and strongly disagree. According to Riduwan (2020), the Likert scale is used to measure respondents' attitudes, perceptions, and opinions regarding a social phenomenon. The questionnaire instrument in this study consists of several indicators, namely: (1) learning flexibility, (2) ease of use of the MOOC platform, (3) student participation in learning, (4) student learning motivation, (5) effectiveness of MOOC-based learning, and (6) development of student digital literacy. These indicators are compiled based on theoretical studies on digital learning and the implementation of MOOCs in higher education.

Learning flexibility indicators include students' ease of accessing materials anytime and anywhere, freedom to determine study times, and the ability to repeat learning materials as needed. Platform ease-of-use indicators include platform appearance, feature accessibility, ease of navigation, and clarity of learning materials. Student participation indicators include student activity in discussion forums, involvement in learning assignments, and interaction with lecturers and other students. Learning motivation indicators include student interest in MOOC-based learning, enthusiasm for participating in online learning, and interest in digital learning media. Learning effectiveness indicators include material understanding, achievement of learning objectives, and student satisfaction with MOOC-based learning. Meanwhile, digital literacy indicators include students' ability to access, understand, and utilize digital information during the learning process.

Before being used in the research, the questionnaire instrument was first tested for validity and reliability. Validity testing was conducted to determine the instrument's accuracy in measuring the research variables. According to Ghozali (2021), a research instrument is considered valid if it is able to measure what it is supposed to measure. Validity testing was conducted using the Pearson Product Moment correlation with the help of the Statistical Product and Service Solutions (SPSS) application. A statement item is declared valid if the calculated *r* value is greater than the table *r* value at a significance level of 5%.

The validity test was conducted using the Pearson Product Moment correlation analysis with the assistance of SPSS version 26. The instrument consisted of 24 statement items distributed across six indicators: learning flexibility, platform usability, student participation, learning motivation, learning effectiveness, and digital literacy. With a sample size of 56 students and a significance level of 5%, the critical value of *r*-table was 0.263. The results indicated that all questionnaire items had *r*-count values ranging from 0.486 to 0.841, which were higher than the *r*-table value (0.263). Therefore, all items were declared valid and suitable for use in the research.

**Table 1 Results of Instrument Validity Test**

Indicator	Number of Items	r-count Range	r-table	Decision
Learning Flexibility	4	0.721–0.841	0.263	Valid
Platform Usability	4	0.648–0.799	0.263	Valid
Student Participation	4	0.486–0.772	0.263	Valid
Learning Motivation	4	0.593–0.814	0.263	Valid
Learning Effectiveness	4	0.612–0.801	0.263	Valid
Digital Literacy	4	0.678–0.835	0.263	Valid

All questionnaire items met the validity criteria because the obtained *r*-count values exceeded the critical *r*-table value. Reliability testing was performed using Cronbach's Alpha coefficient. An instrument is considered reliable if the Cronbach's Alpha value exceeds 0.70. The analysis showed that the overall questionnaire achieved a Cronbach's Alpha value of 0.921, indicating excellent reliability. Furthermore, each research indicator also demonstrated satisfactory reliability levels.

**Table 2. Results of Instrument Reliability Test**

Indicator	Cronbach's Alpha	Criteria
Learning Flexibility	0.876	Highly Reliable
Platform Usability	0.842	Highly Reliable
Student Participation	0.815	Reliable
Learning Motivation	0.861	Highly Reliable
Learning Effectiveness	0.849	Highly Reliable
Digital Literacy	0.884	Highly Reliable
<b>Overall Instrument</b>	<b>0.921</b>	<b>Excellent Reliability</b>

The findings indicate that all questionnaire items were reliable and consistently measured the intended constructs. Therefore, the instrument was considered appropriate for data collection in this study. Next, a reliability test is conducted to determine the level of consistency of the research instrument. According to Sugiyono (2022), an instrument is considered reliable if it is used repeatedly to measure the same object and produces consistent data. Reliability testing is performed using the Cronbach's Alpha coefficient. A research instrument is considered reliable if its Cronbach's Alpha value is greater than 0.70.

Documentation techniques were also used in this study to obtain supporting data related to the implementation of MOOC-based learning. The documentation collected included student attendance lists, learning activities on the MOOC platform, screenshots of discussion forums, student assignments, and data on learning platform usage. According to Sudaryono (2018), documentation is a data collection technique through the review of documents related to the research object. Additionally, limited interviews were conducted with several students to obtain additional information regarding their experiences participating in MOOC-based learning. The interviews were semi-structured, focusing on student learning experiences, challenges in using the MOOC platform, and the benefits of MOOC-based learning in the Literacy Program Development course. Interviews were used as supporting data to strengthen the quantitative research findings.

The research procedure was carried out in several stages. The first stage was the preparation stage. During this stage, the researcher identified the problem, conducted a literature review, developed a research proposal, and developed research instruments in the form of observation sheets and questionnaires. Furthermore, the researcher coordinated with the lecturer in charge of the Literacy Program Development course regarding the research implementation. The second stage is the research implementation stage. During this stage, the researcher observed the MOOC-based learning process in the Literacy Program Development course. Next, the researcher distributed questionnaires to all students in class A and class B who participated in the study. The questionnaires were completed online using Google Forms to facilitate data collection. During this stage, the researcher also collected documentation and conducted limited interviews with several students.

The third stage is data analysis. Data obtained from the questionnaire were analyzed using descriptive statistics techniques. According to Sudijono (2020), descriptive statistics are used to describe or illustrate research data without making broad generalizations. Data analysis was performed by calculating the average score, percentage, and assessment category for each research indicator. The research data were then presented in tables and diagrams to facilitate interpretation.

Quantitative data analysis was conducted using the SPSS application. The analysis stages included data editing, coding, tabulation, and descriptive statistical analysis. Editing was performed to check the completeness of respondents' responses. Coding was performed by assigning a numeric code to each respondent's answer. The data was then tabulated and analyzed to obtain the average value and percentage for each research indicator.

Data from observations, documentation, and interviews were analyzed using qualitative descriptive analysis techniques. This data was used to support the quantitative analysis results to gain a deeper understanding of the implementation of MOOCs in Literacy Program Development learning. According to Miles, Huberman, and Saldana (2018), qualitative data analysis is conducted through three stages: data reduction, data presentation, and conclusion drawing.

In conducting the research, the researcher also considered ethical aspects of the study. Prior to data collection, the researcher first requested permission from the Non-Formal Education Study Program at the University of Bengkulu and the lecturer in charge of the course. Furthermore, the respondents were given an explanation of the research objectives and guaranteed confidentiality. Student participation in the study was voluntary and without any coercion.

This research method is expected to yield valid and comprehensive data on the implementation of MOOCs as a flexible learning innovation in the Literacy Program Development course. The results are expected to provide an empirical overview of the effectiveness of MOOCs in increasing learning flexibility, student participation, and digital literacy development among Non-Formal Education students at the University of Bengkulu.

## RESULTS AND DISCUSSION

### Results

This study aims to describe the implementation of a Massive Open Online Course (MOOC) as a flexible learning innovation in the Literacy Program Development course in the Non-Formal Education Study Program at the University of Bengkulu. The study was conducted on 56 students, consisting of 29 students from class A and 27 students from class B. Data were obtained through observations, questionnaires, documentation, and limited interviews conducted

during the learning process in the even semester of the 2023/2024 academic year.

**Table 3. Comparison of Mean Scores Between Class A and Class B**

Indicator	Class A (n=29)	Class B (n=27)	Overall
Learning Flexibility	91.2%	89.7%	90.5%
Platform Usability	85.8%	84.2%	85.0%
Student Participation	86.3%	84.7%	85.5%
Learning Motivation	86.8%	85.1%	86.0%
Learning Effectiveness	86.9%	85.0%	86.0%
Digital Literacy	90.4%	88.6%	89.5%

The comparison between Class A and Class B revealed relatively similar perceptions regarding the implementation of MOOCs. Class A showed slightly higher scores across all indicators, particularly in learning flexibility (91.2%) and digital literacy development (90.4%). However, the differences between the two classes were relatively small, indicating that the implementation of MOOCs provided comparable learning experiences for students in both classes. MOOC-based learning in the Literacy Program Development course is implemented through an online learning platform that includes instructional videos, digital teaching materials, discussion forums, online quizzes, project-based assignments, and digital learning evaluations. Students participate in all learning activities online and through blended learning according to a predetermined lecture schedule.

The research results show that the implementation of MOOCs in Literacy Program Development learning received a positive response from students. The majority of students stated that MOOC-based learning provided learning flexibility, increased motivation, facilitated access to learning materials, and supported the development of students' digital literacy. The respondents in this study consisted of class A and class B students in the Non-Formal Education Study Program at the University of Bengkulu who were taking the Literacy Program Development course. The distribution of respondents can be seen in the following table.

Observations indicate that MOOC-based learning has changed student learning patterns. Students appear more active in accessing learning materials before lectures begin. Student activity on the MOOC platform demonstrates increased interaction in discussion forums and increased access to learning videos and digital teaching materials.

Students accessed materials not only during scheduled lectures but also outside of class hours. This demonstrates that MOOC-based learning provides students with flexibility in determining their own study time according to their individual needs. Furthermore, observations also showed that the use of instructional videos and online discussion forums increased student engagement in the learning process. Students were more confident in expressing their opinions through online discussion forums than during conventional face-to-face learning. Some students who were previously passive in class discussions appeared more active in providing comments and responses to the learning materials. The main research data was obtained through a questionnaire consisting of six indicators, namely: (1) learning flexibility, (2) ease of use of the MOOC platform, (3) student participation, (4) student learning motivation, (5) effectiveness of MOOC-based learning, and (6) development of student digital literacy.

The results of the study showed that the majority of students responded positively to the flexibility of MOOC-based learning.

**Table 4. Results of the Learning Flexibility Questionnaire**

No	Indicator	Percentage
1	Materials can be accessed at any time	92%
2	Materials can be accessed anywhere	89%
3	Students can learn at their own pace	87%
4	Students can repeat the learning material	94%
	Average	90.5%

The table above shows that the learning flexibility indicator averaged 90.5%, categorized as very good. Students stated that using MOOCs made it easier for them to access learning materials anytime and anywhere. Furthermore, they found it easier to understand the material because they could repeat learning videos and digital teaching materials according to their individual learning needs.

Interview results also showed that students felt more comfortable learning using MOOCs because they weren't confined to a traditional classroom. They could study independently at their own pace.

**Table 5. Results of the Platform Ease of Use Questionnaire**

No	Indicator	Percentage
1	Easy to understand platform display	85%
2	The learning menu is easy to use	83%
3	Easy to access learning videos	88%
4	Easy to use discussion forum	84%
	Average	85%

The research results showed that students rated the MOOC platform as quite easy to use. An average score of 85% indicated a very good rating. Students stated that the features on the MOOC platform were simple and easy to understand, facilitating the learning process.

Despite this, some students still experience technical challenges such as unstable internet connections and limited

data allowances when accessing long-form instructional videos. These challenges are particularly significant for students living in areas with limited internet access.

**Table 6. Results of the Student Participation Questionnaire**

No	Indicator	Percentage
1	Actively participate in discussion forums	82%
2	Actively working on online assignments	90%
3	Actively access learning materials	91%
4	Actively provide feedback in discussions	79%
	Average	85.5%

Research results show that the use of MOOCs can increase student participation in learning. Students become more active in accessing materials and completing learning assignments. Online discussion forums also provide a broader space for students to express their opinions and engage in discussions with peers and lecturers.

Based on observations, students who are typically passive during face-to-face learning appear more active in online discussions. This indicates that MOOC-based discussion forums can create a more inclusive and participatory learning environment.

**Table 7. Results of the Learning Motivation Questionnaire**

No	Indicator	Percentage
1	Learning is more interesting	88%
2	Students are more enthusiastic about learning	84%
3	Learning videos increase interest in learning	90%
4	Digital learning is not boring	82%
	Average	86%

The data shows that MOOC-based learning can increase student motivation. The use of instructional videos, interactive media, and discussion forums makes the learning process more engaging than conventional learning.

Students feel that digital learning provides a new, more flexible and enjoyable learning experience. Furthermore, they feel more challenged to explore additional learning resources independently.

**Table 8. Results of the Learning Effectiveness Questionnaire**

No	Indicator	Percentage
1	The material is easier to understand	86%
2	Learning objectives achieved	84%
3	Learning helps understand the concept of literacy	89%
4	Learning improves learning outcomes	85%
	Average	86%

The research results indicate that the use of MOOCs is considered effective in supporting Literacy Program Development learning. Students stated that the use of learning videos and digital teaching materials helped them understand literacy concepts more deeply.

Students also feel that MOOC-based learning allows them to learn the material gradually and repeatedly so that their understanding of the material becomes better.

**Table 9. Results of the Digital Literacy Questionnaire**

No	Indicator	Percentage
1	Improve the ability to use technology	92%
2	Improve digital information search skills	89%
3	Improve the ability to understand digital information	87%
4	Improving digital-based independent learning skills	90%
	Average	89.5%

The data shows that MOOC use positively contributes to the development of students' digital literacy. Students become more accustomed to using digital platforms, seeking out online learning resources, and independently understanding digital-based information.

## DISCUSSION

The research results show that the implementation of a MOOC in the Literacy Program Development course has a positive impact on the learning process of Non-Formal Education students at the University of Bengkulu. The use of MOOCs can create more flexible, interactive, and adaptive learning to meet students' needs in the digital age.

One of the main findings of this study is the high level of flexibility of MOOC-based learning. Students find it easier to access learning materials anytime and anywhere, without being limited by space and time. This finding aligns with Kaplan and Haenlein's (2016) opinion, which states that MOOCs provide high flexibility in the learning process

because students can determine the time and pace of their learning according to their individual needs.

Learning flexibility is a crucial factor in enhancing student learning comfort. Students have the opportunity to review learning material they haven't yet grasped, making the learning process more effective. In the context of non-formal education, learning flexibility is particularly relevant because it fundamentally emphasizes the principle of openness and individual student learning needs. The use of MOOCs also allows students to learn independently through exploration of digital learning resources. This supports the concept of student-centered learning, which positions students as active participants in learning. According to Bates (2019), digital learning encourages students to be more independent in constructing knowledge through the use of technology.

The results of the study indicate that the use of MOOCs can increase student participation in learning. Online discussion forums provide a space for students to express their opinions more freely. Students who are usually passive in face-to-face learning become more active during online discussions. This finding is in line with research by Anderson et al. (2014) which states that social interaction in online learning is an important factor in increasing student engagement. Online discussion forums allow students to share ideas, discuss, and build knowledge collaboratively. In addition, the use of project-based assignments and online quizzes also increases student engagement in the learning process. Students become more active in accessing learning materials and completing assignments independently.

The use of MOOCs in learning has become increasingly relevant following the COVID-19 pandemic. The pandemic has forced all educational institutions to adapt to online learning systems in an effort to maintain the continuity of the educational process. According to Dhawan (2020), the COVID-19 pandemic has accelerated digital transformation in education because all learning activities are conducted online. This situation has led lecturers and students to become increasingly accustomed to using digital technology in the learning process. Even after the pandemic ends, online learning remains a crucial part of future learning systems because it is considered more flexible and efficient. MOOC-based learning not only provides easy access to learning but also supports the development of 21st-century skills such as critical thinking, collaboration, communication, and creativity. According to Siemens (2015), MOOC-based digital learning enables students to construct knowledge independently through interaction, collaboration, and exploration of digital learning resources. Students not only receive material from lecturers but also actively seek information, discuss, and build understanding through online learning experiences. Therefore, MOOCs are a learning model that suits the characteristics of today's digital generation.

In the context of non-formal education, the use of MOOCs has strong relevance because non-formal education is inherently flexible, open, and oriented to community needs. Non-formal education not only serves as a complement to formal education but also as a means of community empowerment through various needs-based educational programs. According to Sudjana (2018), non-formal education is characterized by flexible and adaptive learning that adapts to social developments. Therefore, technology-based learning innovations are crucial for non-formal education to be able to meet the challenges of modern development. The Non-Formal Education Study Program, as part of higher education, is responsible for producing graduates who are able to adapt to technological developments and the needs of a digital society. Non-Formal Education students are required not only to understand the concept of community education but also to develop innovative, technology-based learning programs. One course that is crucial for developing these competencies is Literacy Program Development.

Non-formal education students need to possess digital literacy skills to develop community education programs relevant to the needs of the digital era. According to Gilster (2015), digital literacy is the ability to understand and use information from various digital sources effectively and critically. In the context of learning, digital literacy skills are crucial because students must be able to access, evaluate, and utilize digital information responsibly. Therefore, the use of MOOCs in the Literacy Program Development course can be a learning strategy that supports the improvement of students' digital literacy competencies. This study also shows that MOOC-based learning can increase student learning motivation. The use of digital learning media such as interactive videos and discussion forums creates a more engaging and less monotonous learning experience. According to Martin and Bolliger (2018), the use of interactive technology in online learning can increase student engagement in the learning process. Students feel more interested in participating in learning because the material is presented in a more varied and modern format. High learning motivation is also evident in the increased frequency of student access to learning materials outside of class hours. This indicates a greater student curiosity about the learning material. Another important finding in this study is the improvement in students' digital literacy skills after participating in MOOC-based learning. Students became more accustomed to using digital technology in the learning process. According to Gilster (2015), digital literacy is the ability to understand and use digital information effectively. The use of MOOCs in learning provides students with hands-on experience in utilizing digital technology for learning.

Students not only learn to understand course material but also how to search for digital information, evaluate learning resources, and use technology platforms responsibly. These skills are essential competencies for Non-Formal Education students who will later be involved in developing digital-based community education programs. Although MOOC implementation offers many benefits, this study also identified several challenges. The main obstacle faced by students was limited internet connection and data quota. Some students had difficulty accessing learning videos due to unstable network quality. Furthermore, some students were still unfamiliar with independent online learning. Some students still needed guidance from lecturers to understand the learning material. These findings align with research by Hew and Cheung (2014), which stated that the main challenge to MOOC implementation was students' low consistency and lack of learning independence.

## CONCLUSION

Based on the research results, the implementation of a Massive Open Online Course (MOOC) in the Literacy Program Development course in the Non-Formal Education Study Program at the University of Bengkulu has been

proven to be able to create more flexible, interactive, and effective learning. The use of MOOCs makes it easy for students to access learning materials anytime and anywhere, thereby increasing student independence and learning motivation. In addition, MOOC-based learning can also increase student participation in discussions and digital learning activities and support the development of digital literacy among Non-Formal Education students. Although there are still obstacles such as limited internet connection and readiness for independent learning, in general, the implementation of MOOCs has made a positive contribution to the quality of learning in Literacy Program Development. The results of this study indicate that MOOCs have great potential to be developed as a digital learning innovation in higher education, especially in supporting learning transformation in the field of non-formal education.

## REFERENCES

- Alraimi, K. M., Zo, H., & Ciganek, A. P. (2015). Understanding the MOOCs continuity: The role of openness and reputation. *Computers & Education, 80*, 28–38. <https://doi.org/10.1016/j.compedu.2014.08.006>
- Bates, A. W. (2019). *Teaching in a digital age: Guidelines for designing teaching and learning* (2nd ed.). Tony Bates Associates.
- Belawati, T. (2019). *Pembelajaran online*. Universitas Terbuka.
- Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2021). Mapping research in student engagement and educational technology in higher education: A systematic review. *Computers & Education, 168*, 104205. <https://doi.org/10.1016/j.compedu.2021.104205>
- Bozkurt, A., Akgün-Özbek, E., & Zawacki-Richter, O. (2017). Trends and patterns in Massive Open Online Courses: Review and content analysis of research on MOOCs (2008–2015). *International Review of Research in Open and Distributed Learning, 18*(5), 118–147.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage.
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5–22. <https://doi.org/10.1177/0047239520934018>
- Gilster, P. (2015). *Digital literacy*. Wiley.
- Ghozali, I. (2021). *Aplikasi analisis multivariate dengan program IBM SPSS* (10th ed.). Badan Penerbit Universitas Diponegoro.
- Hew, K. F., & Cheung, W. S. (2014). *Using blended learning: Evidence-based practices*. Springer.
- Kaplan, A. M., & Haenlein, M. (2016). Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster. *Business Horizons, 59*(4), 441–450.
- Kerimbayev, N., Umirzakova, Z., Shadiev, R., et al. (2023). A student-centered approach using modern technologies in distance learning: A systematic review of the literature. *Smart Learning Environments, 10*, 61. <https://doi.org/10.1186/s40561-023-00280-8>
- Lindín, C., Engel, A., Gràcia, M., Rivera-Vargas, P., & Rubio, M. J. (2023). Literature review on emerging educational practices mediated by digital technologies in higher education. *SAGE Open, 13*(4). <https://doi.org/10.1177/21582440231204677>
- Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning Journal, 22*(1), 205–222.
- Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education, 159*, 104009. <https://doi.org/10.1016/j.compedu.2020.104009>
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2018). *Qualitative data analysis: A methods sourcebook* (4th ed.). Sage.
- Moore, M. G., & Kearsley, G. (2018). *Distance education: A systems view of online learning* (4th ed.). Cengage.
- Riduwan. (2020). *Skala pengukuran variabel penelitian*. Alfabeta.
- Siemens, G. (2015). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning, 2*(1), 3–10.
- Stracke, C. M., Burgos, D., & Tlili, A. (2023). Instructional quality and learning design of Massive Open Online Courses. In O. Zawacki-Richter & I. Jung (Eds.), *Handbook of Open, Distance and Digital Education*. Springer. [https://doi.org/10.1007/978-981-19-2080-6\\_95](https://doi.org/10.1007/978-981-19-2080-6_95)
- Sugiyono. (2022). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta.
- UNESCO. (2023). *Global Education Monitoring Report 2023: Technology in education—A tool on whose terms?* UNESCO.
- Wentao Meng, W., Yu, L., Liu, C., Pan, N., Pang, X., & Zhu, Y. (2024). A systematic review of the effectiveness of online learning in higher education during the COVID-19 pandemic period. *Frontiers in Education, 8*. <https://doi.org/10.3389/feduc.2023.1334153>
- Zawacki-Richter, O., Kerres, M., Bedenlier, S., Bond, M., & Buntins, K. (Eds.). (2020). *Systematic reviews in educational research*. Springer.
- Zawacki-Richter, O., Jung, I. (Eds.). (2023). *Handbook of Open, Distance and Digital Education*. Springer.