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DEVELOPMENT OF CONTENT MOOCS: DESIGNING A CREATIVITY ASSESSMENT FOR ELEMENTARY SCHOOL STUDENTS IN A LEARNING MANAGEMENT SYSTEM (LMS) WITH A SELF-PACED INSTRUCTION MODEL

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ABSTRACT

Becoming a world-class open and distance learning university involves developing academic products by improving the quality of academic services and service reach for the entire community. Therefore, developing MOOC content in UT's Learning Management System (LMS) using the Self-Paced Instruction model is crucial. The lack of topics in UT's MOOCs needs to be addressed wisely. The issues to be addressed are the validity of the MOOC content on the topic of Designing an Assessment of Creativity for Elementary School Students linked to the UT LMS, and the competencies/learning outcomes and responses of students using the developed online course, This development research design uses the four-D model (4-D model), adapted from Thiagarajan et al., with the stages Define, Design, Develop, and Disseminate. The research was conducted at the UT Surabaya UPBJJ (Education and Training Center) and Unesa (Unesa) as a collaborative research and development partner. Data were obtained from expert validation of MOOC content, learning outcomes, and responses from online course participants during limited trials in the Bojonegoro and Lamongan Learning Groups (Pokjar). The validation data from three education experts were described and the mean was determined. The online course participant test scores were reviewed and compared against the graduation criteria established by UT. The questionnaire response data was analyzed using percentages and described qualitatively. The development of the MOOC content for elementary school students' Creativity Assessment was found to be valid and reliable. Student learning outcomes improved. Students provided very positive responses, and the MOOCs can be accessed by all users of the UT LMS.

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I. INTRODUCTION

THE increasingly rapid development of technology, especially entering the era of technology adoption. All activities are inseparable from the use of technology, both digital and conventional [1]. One of the technologies that is often used is digital technology and its application [2]. The use of digital technology has now expanded to various sectors of life, ranging from health, education, business, to daily life. This is because digitalization is able to run and solve problems well and flexibly. One of them is in the academic field, where the use of digital technology is often involved in learning, data search, data analysis and even the creation of reports. This is very important for digitalization in universities as a form of concern for the development of the era of technology adoption both in terms of teaching, research and community service [3, 4].

Schools, as part of educational institutions, are required to provide quality academic services that reach all levels

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of society. One strategy adopted is through the development of a Learning Management System (LMS). A Learning Management System (LMS) is important in education because it provides an integrated platform for systematically managing learning materials, assignments, and evaluations [5]. The presence of an LMS allows for a more flexible teaching and learning process, both synchronously and asynchronously, according to student needs. In addition, an LMS increases time efficiency by facilitating access to materials anytime and anywhere without the constraints of a classroom [6].

Currently, the number and diversity of LMS in education are still limited, so it is necessary to develop content that is appropriate to learning needs, relevant, and useful. The development of Learning Management Systems (LMS) in Indonesia still faces several obstacles that limit its effectiveness [7, 8]. One of the main obstacles is limited technological infrastructure, such as uneven internet connections and inadequate hardware in various regions. Although national internet penetration has reached around 64.8% in 2020, the level of digital literacy of users is still low, so LMS has not been optimally utilized. This lack of LMS usage has resulted in the potential for LMS use being unfulfilled in various schools and universities [9]. Innovation is needed to improve the quality of LMS in online learning to make it easier for teachers and students to carry out learning activities.

The innovation needed is designing flexible learning through the use of LMS and digital technology. One such innovation is the development of Massive Open Online Courses (MOOCs). MOOCs are the process of designing and providing open online courses that can be accessed by anyone without any limitations on the number of participants [10]. This process includes planning, creating interactive content, implementing it on an LMS platform, and evaluating its effectiveness [11]. The goal is to expand access to quality education through independent and flexible learning. It is important to know how to design, develop, and assess the validity of MOOC content on the theme of Designing Creativity Assessments for Elementary School Students integrated into an LMS. In addition, it is also necessary to examine students' competency achievements/learning outcomes and their responses to the developed online courses.

This study aims to describe the validity of MOOC content developed on the topic of assessing elementary school students' creativity, thus ensuring that the material is prepared in accordance with academic eligibility standards. Furthermore, this study also aims to assess student competency achievements through the MOOC-based learning process integrated into UT's LMS, thereby providing a concrete picture of the effectiveness of independent online learning. Furthermore, this study identifies student responses to the learning experience obtained, both in terms of content quality, ease of access, and relevance of the material to learning needs. Thus, the results of this study not only contribute to the development of digital learning content but also strengthen the use of educational technology in improving access, quality, and efficiency of distance learning in the era of digital transformation.

II. METHOD

A. *Type of Research*

This research, based on the Learning Management System in open online course activities, is a development research. The researcher used this type of research because it aims to develop a product, namely MOOCs content on the topic of designing Elementary School Students' Creativity Assessment using the Self-Paced Instruction model. This model can later be used operationally in online course activities at UT. This is in accordance with the opinion of Borg & Gall (2007) who stated that the main objective of development research is to develop effective products that can be used in schools [12, 13]. The products in question are not only limited to concrete objects, such as textbooks or questions, but also include procedures and processes such as learning models or strategies. The product development procedure used in this study is the four D models (4-D model) [14, 15].

Fig. 1. 4D Model Research

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B. *Research Population*

The research was conducted at UPBJJ UT Surabaya and Surabaya State University as collaborative research and development partners. A limited trial was conducted at the origins of the online course participants of Pokjar Bojonegoro and Pokjar Lamongan, East Java. The research focused on the MOOCs content on Designing Creativity Assessments for Elementary School Students which will be linked to the UT Learning Management System (LMS) with a Self-Passed Instruction model. Data sources were obtained from validation results from experts or expert validators on the MOOCs content on the topic of Designing Creativity Assessments for Elementary School Students. Data sources were also obtained from online course participants during the limited trial at Pokjar Bojonegoro and Pokjar Lamongan.

C. *Data Analysis Techniques*

Validation data for the MOOCs design and content were obtained after being assessed by 3 (three) learning experts. Validation serves to determine the validity and accuracy of the media or devices developed before being tested on a limited or wide scale [16]. Validation data for the course participant competency measurement instrument were obtained after being assessed by 3 (three) instrument experts. Data on the results of the online course participant competency test were obtained after course participants from Bojonegoro and Lamongan completed the test. The response questionnaire was obtained after online course participants in the limited trial completed the questionnaire. The data obtained were analyzed using quantitative and qualitative descriptive analysis

III. Results And Discussion

In conducting research and development (R&D) using the 4D model, data was obtained from the initial analysis to the widespread distribution of MOOCs. The data were analyzed based on the following results:
Results

A. *Define dan Design MOOCs*

The Massive Open Online Courses (MOOCs) are conducted in eight sessions, with a general introduction at the beginning, introducing the content and program-related topics. The program offered is designing a Creativity Assessment for Elementary School Students. This creativity assessment is necessary to equip PGSD students as prospective elementary school teachers and online course participants who are education observers with an interest and motivation in the field of creativity. MOOCs are structured with a flexible flow and provide clear direction and evaluation.

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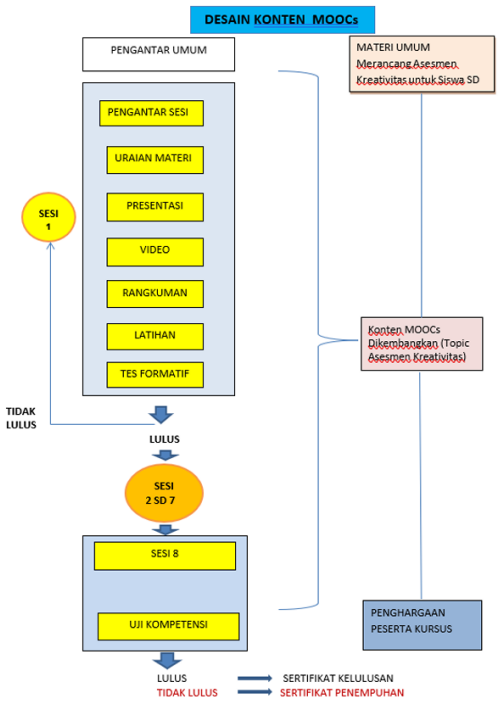

Fig. 2. MOOCs Content Flow

Preparation of MOOCs design flow in LMS, LMS MOOCs content development structure for Self-Paced Instruction model material on Designing Creativity Assessment for Elementary School Students.

B. Validity of MOOCs

MOOCs content contains material on designing creativity assessments for elementary school students with the Self-Paced Instruction Model as a guide for tutors and course participants in understanding what assessment is, creativity, its relationship to its creation, how to measure creativity with creativity indicators from Guilford associated with HOTS, etc. A summary of the results of the MOOCs content validation is presented in Table 1 below

TABLE I.
VALIDITY OF MOOCS CONTENT

Assessment Aspect	Indicator	Validity	Reliability	Note
Content Format	a. Learning activities relevant to the objectives.	3.00 (V)	100%	Reliable
	b. Balanced text and illustrations.	3.00 (V)	100%	Reliable
	c. Appropriateness of the content size for course participants.	3.33 (SV)	86%	Reliable
	d. Level of visual attractiveness of the content.	3.00 (V)	100%	Reliable
Marketing Material	a. Content uses standard book references.	3.00 (V)	100%	Reliable
	b. Accuracy of content (facts, principles, concepts, laws, theories, processes).	3.33 (SV)	86%	Reliable
	c. Content up-to-dateness.	2.67 (V)	80%	Reliable
	d. Systematic according to scientific structure.	3.00 (V)	100%	Reliable
	e. Relevant to LPTK/school curriculum.	3.33 (SV)	86%	Reliable
Language	a. Readability suitable for course participants.	3.33 (SV)	86%	Reliable
	b. Using proper and correct Indonesian language.	3.33 (SV)	86%	Reliable
	c. Appropriate terminology selection and easy to understand.	3.33 (SV)	86%	Reliable
	d. Consistent terminology.	3.00 (V)	100%	Reliable

	e. Communicative and effective language.	3.33 (SV)	86%	Reliable
Presentation	a. Training participants to understand and use process skills.	3.33 (SV)	86%	Reliable
	b. Appropriate to the level of thinking and reading ability of course participants.	2.67 (V)	80%	Reliable
	c. Encouraging participants to develop creativity and independence.	2.67 (V)	80%	Reliable
	d. Attractive and enjoyable.	3.00 (V)	100%	Reliable
Supporting Innovation and Quality	a. Alignment with curriculum.	3.33 (SV)	86%	Reliable
	b. Emphasizes real-world education.	3.33 (SV)	86%	Reliable
	c. Facilitates the development of entrepreneurial process skills.	3.00 (V)	100%	Reliable
	d. Facilitates creativity, personality, and independence in searching and developing marketing.	3.00 (V)	100%	Reliable
	e. Utilization of social media in marketing.	3.33 (SV)	86%	Reliable

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The results of the MOOCs content validation include the assessment of the MOOCs content format, material, language, presentation, supporting innovation and quality improvement, obtaining assessment criteria in two categories, namely valid and very valid [16, 17]. In addition, the reliability coefficient for each aspect of the assessment is in the range of 86% to 100%; so that the results of the MOOCs content validation also meet the reliable criteria [18]. In addition, the results of the validation of the question instrument to measure the competence of MOOCs course participants include the assessment of the content aspect with 5 statements and the written language aspect with 4 statements, obtaining assessment criteria in the very valid category, so that the competency measurement instrument to determine the graduation of this Online course participant is suitable for use. This can be seen in Table 2 below,

TABLE II. VALIDITAS INSTRUMEN MOOCS

No.	Assessment Aspect	Validator 1	Validator 2	Validator 3	%	Category
Content						
1.	Items are developed in accordance with the subject matter being taught.	4	4	4	100	Very Valid
2.	Questions tested are in accordance with the indicators used.	3	3	4	83.33	Very Valid
3.	Suitability of questions/items with the learning process and model.	3	4	4	91.67	Very Valid
4.	The quality of the test and assessment used is relevant.	3	4	3	83.33	Very Valid
5.	The test items can measure the expected skills.	3	4	4	91.67	Very Valid
Language and Writing						
6.	Language used is communicative and appropriate to the educational level of the respondents.	3	4	4	91.67	Very Valid
7.	Language used is standard Indonesian and easy to understand.	4	3	4	91.67	Very Valid
8.	Statements are concise and logical.	4	4	3	91.67	Very Valid
9.	Sentences are free from ambiguity or multiple interpretations.	3	3	4	83.37	Very Valid
Average					**89.82**	**Very Valid**

C. Student Response

In the dissemination phase, MOOCs, equipped with LMS integration within a digital platform, provide students with flexible learning opportunities, increasing their enthusiasm and creativity. Nearly 90% of students expressed interest in using the MOOC content, as evidenced by previously obtained validity and reliability results. The ease of access and interactive presentation of the content encouraged increased student enthusiasm in participating in each learning module. This significantly facilitated the development of their problem-solving skills, as students could actively identify problems, explore various solutions, and apply learned concepts through simulations or project-based assignments. Furthermore, the use of creative and varied MOOC content stimulated students' imaginations, thus increasing their creativity in solving problems and generating innovative ideas. Nearly 90% of students reported feeling interested and motivated by the MOOC content, which aligns with the validity and reliability results of the instrument, which demonstrated the media's effectiveness in supporting problem-solving, enthusiasm, and creativity in student learning.

Discussion

Based on the results of the MOOC content validation presented in Table I, the application of technology, particularly through the Learning Management System (LMS) platform, has proven crucial in supporting effective, relevant, and adaptive education. In the context of open and distance education, such as that promoted by UT, technology enables the distribution of materials that are broad, interactive, and flexibly accessible to students. The validation results indicate that important aspects deemed highly valid for supporting successful learning through technology include Content Format, Presentation, and Supporting Innovation and Quality. The Content Format aspect, which includes the suitability of learning activities, balanced text and illustrations, and visual appeal, demonstrates that engaging and purposeful content design is crucial in digital learning. In the Presentation aspect, indicators such as the ability to train process skills and capture participants' attention strongly support the effectiveness of technology-based MOOCs. Furthermore, the Supporting Innovation and Quality aspect, which assesses curriculum alignment, emphasis on real-world learning, and social media integration, underscores the importance of innovation in delivering content digitally. This means that the success of technology use in education depends

not only on the LMS platform itself, but also on how the content is designed, communicated, and integrated with real-world contexts that are relevant to learners' needs [19].

In the context of elementary school education, which currently faces challenges in equalizing access and improving the quality of learning, the presence of an LMS in the development of MOOC content is a relevant and much-needed solution. LMS-based learning provides flexibility for elementary school teachers and students to access materials at any time, enabling the learning process to no longer be limited to the classroom and school hours [11, 20]. This is especially important in areas with limited resources or limited teaching staff. Furthermore, with interactive and multimedia features in the LMS, learning materials can be delivered in a more engaging and easily understood manner for early childhood students, such as in the topic of Elementary School Student Creativity Assessment developed in this study. LMS integration also helps teachers track student learning progress instantly and provide rapid feedback, making the learning process more adaptive and responsive to individual student needs. Thus, the use of an LMS in MOOCs not only supports open and flexible education but also strengthens the foundation of learning at the elementary school level in facing the current digital era.

AI integration is also needed in the future. The use of LMS-based learning models and the integration of artificial intelligence (AI) in elementary school education faces several challenges, such as the gap in technology access in remote areas, the low readiness of teachers and students in using digital platforms, and the need for content that is appropriate to children's developmental stages. Furthermore, the use of AI raises ethical and data security issues that need to be anticipated early on. Therefore, a hybrid learning model is needed that combines online and offline learning in a balanced manner, improves teachers' digital competencies, and develops child-friendly MOOC content with a visual and interactive approach. AI should be utilized to support personalized learning and automated assessment, but still under the supervision of educators. Collaboration between the government, educational institutions, and the private sector is also crucial in providing appropriate and inclusive infrastructure, training, and platform development to support learning transformation at the elementary school level.

IV. CONCLUSION

The research results obtained that the MOOCs content developed with LMS (Learning Management System) integration was valid for use in learning and assessing the creativity of elementary school students. In addition, the reliability coefficient for each aspect of the assessment was in the range of 86% to 100%; so the results of the MOOCs content validation also met the reliable criteria. Through MOOCs, the success of using technology in education does not only depend on the LMS platform itself, but also on how the content is designed, communicated, and integrated with real-world contexts that are relevant to the needs of students. LMS integration also helps teachers in tracking student learning progress instantly and providing rapid feedback, so that the learning process becomes more adaptive and responsive to individual student needs. The use of LMS in MOOCs not only supports open and flexible education, but also strengthens the foundation of learning at the elementary school level in facing the current digital era.

REFERENCES

[1] M. Shahzad, M. T. Shafiq, D. Douglas, and M. Kassem, "Digital twins in built environments: an investigation of the characteristics, applications, and challenges," *Buildings*, vol. 12, no. 2, p. 120, 2022. [Online]. Available: https://doi.org/10.3390/buildings12020120

[2] R. T. Lintangesukmanjaya, A. Mahendra, S. Anugrah, B. K. Prahani, D. Dwikoranto, M. Satriawan, and I. A. Rizki, "A EFA analysis of digital technology teaching materials in improving students' critical thinking in physics learning," *JPPS (Jurnal Penelitian Pendidikan Sains)*, pp. 23–38, 2024. [Online]. Available: https://doi.org/10.26740/jpps.v14n1.p23-38

[3] O. Anuyah, A. M. Conrado, C. Carlson, H. Gilbride, and R. Metoyer, "Exploring the barriers and potential opportunities of technology integration in community-based social service organizations," *ACM J. Comput. Sustain. Soc.*, vol. 1, no. 1, pp. 1–28, 2023. [Online]. Available: https://doi.org/10.1145/3610720

[4] M. Al-Emran and C. Griffy-Brown, "The role of technology adoption in sustainable development: Overview, opportunities, challenges, and future research agendas," *Technology in Society*, vol. 73, p. 102240, 2023. [Online]. Available: https://doi.org/10.1016/j.techsoc.2023.102240

[5] B. K. Prahani, J. Alfin, A. Fuad, H. Saphira, E. Hariyono, and N. Suprapto, "Learning management system (LMS) research during 1991–2021: How technology affects education," *Int. J. Emerg. Technol. Learn. (iJET)*, vol. 17, no. 17, pp. 28–49, 2022

[6] A. Al Mansoori, S. Ali, S. A. Pasha, M. Alghizzawi, M. Elareshi, A. D. Ziani, and H. Alsridi, "Technology enhanced learning through learning management system and virtual reality googles: a critical review," in *From Industry 4.0 to Industry 5.0: Mapping the Transitions*, pp. 557–564, 2023. [Online]. Available: https://doi.org/10.1007/978-3-031-28314-7_48.

[7] H. Fibriasari, W. Andayani, T. T. A. Putri, and N. Harianja, "Learning management system now and in the future: Study case from the Indonesian university students," *Int. J. Inf. Educ. Technol. (IJIET)*, vol. 13, no. 1, pp. 158–165, 2023.

[8] C. Kurniawan, O. Fajarianto, I. N. Sari, T. C. Wulandari, and E. Marlina, "Assessing learning management system (LMS) for the dairy farmer: Obstacles to delivering online learning content," *JTP–J. Teknol. Pendidik.*, vol. 24, no. 3, pp. 341–352, 2022. [Online]. Available: https://doi.org/10.21009/jtp.v24i3.31453

[9] D. Olugbade, O. A. Ojo, and A. E. Tolorunleke, "Challenges and limitations of Moodle LMS in handling large-scale projects: West-African universities lecturers' perspective," *J. Educ. Technol. Instr.*, vol. 2, no. 2, pp. 47–66, 2023.

[10] Z. N. Khlaif, M. Ghanim, A. A. Obaid, S. Salha, and S. Affouneh, "The motives and challenges of developing and delivering MOOCs courses," *Educ. Knowl. Soc. (EKS)*, vol. 22, p. e23904, 2021. [Online]. Available: https://doi.org/10.14201/eks.23904

[11] M. S. H. Munna, M. R. Hossain, and K. R. Saylo, "Digital education revolution: Evaluating LMS-based learning and traditional approaches," *J. Innov. Technol. Converg.*, vol. 6, no. 2, 2024. [Online]. Available: https://doi.org/10.69478/JITC2024v6n002a03
[12] H. Yu, "Reflection on whether Chat GPT should be banned by academia from the perspective of education and teaching," *Front. Psychol.*, vol. 14, p. 1181712, 2023. [Online]. Available: https://doi.org/10.3389/fpsyg.2023.1181712
[13] M. F. I. Honga, M. J. Rampe, A. Lihiang, and E. Pongoh, "Developing learning module of environmental pollution materials based on the Borg and Gall model to students at Public Junior High School 3 Tondano," unpublished.
[14] R. B. Indaryanti, H. Harsono, S. Sutama, B. Murtiyasa, and B. Soemardjoko, "4D research and development model: Trends, challenges, and opportunities review," *J. Kajian Ilmiah*, vol. 25, no. 1, pp. 91–98, 2025. [Online]. Available: https://doi.org/10.31599/na7deq07
[15] N. I. Hl, N. Nasruddin, A. E. Sejati, and A. Sugiarto, "Developing teaching material of research methodology and learning with 4D model in facilitating learning during the COVID-19 pandemic to improve critical thinking skill," *J. Kependidikan*, vol. 9, no. 2, pp. 541–554, 2023. [Online]. Available: https://doi.org/10.33394/jk.v9i2.7110
[16] R. T. Lintangesukmanjaya, A. Rizka, and A. B. Damarsha, "The Rasch model analysis: Case study in SDGs trend point 7 in physics learning based domicile," *J. Indones. Sustain. Dev. Plan.*, vol. 6, no. 2, pp. 173–184, 2025. [Online]. Available: https://doi.org/10.46456/jisdep.v6i2.608
[17] T. T. N. Vu, "Understanding validity and reliability from qualitative and quantitative research traditions," *VNU J. Foreign Stud.*, vol. 37, no. 3, 2021. [Online]. Available: https://doi.org/10.25073/2525-2445/vnufs.4672
[18] P. Coleman, "Validity and reliability within qualitative research for the caring sciences," *Int. J. Caring Sci.*, vol. 14, no. 3, pp. 2041–2045, 2022.
[19] A. M. Al-Rahmi, A. Shamsuddin, U. Alturki, A. Aldraiweesh, F. M. Yusof, W. M. Al-Rahmi, and A. A. Aljeraiwi, "The influence of information system success and technology acceptance model on social media factors in education," *Sustainability*, vol. 13, no. 14, p. 7770, 2021. [Online]. Available: https://doi.org/10.3390/su13147770
[20] Y. N. Asrida, F. Amanda, and J. U. Fadilah, "Effectiveness and limitations on learning management systems (LMS) in learning and teaching: A systematic review," *ICOERESS*, vol. 1, no. 1, pp. 141–152, 20