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Students' Perceptions of the Use of Artificial Intelligence in Discussion Forum Evaluation on Massive Open Online Courses Platform

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Abstract: This study explores university students' perceptions of the use of Artificial Intelligence (AI) in evaluating discussion activities within Massive Open Online Courses (MOOCs). Using a quantitative cross-sectional survey, data were collected from 112 undergraduate students who had participated in AI-assisted discussion forums across four MOOCs. Descriptive statistics were used to analyze students' perceptions of MOOCs and AI-assisted evaluation, followed by inferential tests to examine differences across demographic variables. Findings indicate that students hold generally positive perceptions of MOOCs, particularly regarding their flexibility, ease of use, and structured learning design. Students also evaluated discussion forums as relevant, understandable, and motivating. Although students showed moderate acceptance of AI involvement in evaluation, ethical concerns remained evident. Inferential analysis showed no significant differences in perceptions across most demographic variables, with the exception of employment status, which influenced perceptions of AI-assisted evaluation. The study highlights the need for ethical, transparent, and pedagogically aligned implementation of AI in online learning assessment.

Keywords: Artificial Intelligence; Educational Evaluation; Educational Technology; MOOCs; Open Education

Introduction

Global education is currently grounded in universal values of inclusivity and the democratization of knowledge, where every individual deserves access to quality learning regardless of geographical barriers (Arowosegbe et al., 2024; Stöhr et al., 2024). Scientifically, the integration of technology in education is not merely a supportive tool but a catalyst for creating adaptive, human-centered learning ecosystems (Kim et al., 2023; Saúde et al., 2024). In an era of massive digitalization, the efficiency of evaluation has become a primary parameter for maintaining academic standards (Zhou et al., 2024). This transformation demands a balance between technological automation and ethical values of transparency to ensure fairness for all learners (Sperling et al., 2024; Su et al., 2023).

The development of digital technology has a significant impact on modern learning practices, particularly in expanding access, increasing flexibility, and enriching the learning experience. Various technological innovations continue to strengthen efforts to achieve educational equality, including through the provision of large-scale online learning platforms. One rapidly developing innovation is Massive Open Online Courses (MOOCs), which offer open and flexible learning to participants across a variety of contexts (Wei et al., 2021). The use of MOOCs has grown since the COVID-19 pandemic, when many educational

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institutions shifted to distance learning to ensure the continuity of teaching and learning (Tao et al., 2022).

MOOCs are designed as open online courses accessible to anyone with an internet connection. These platforms typically provide structured materials, such as learning videos, quizzes, assignments, discussion forums, and certificates of completion. In some Indonesian universities, MOOCs have even become an academic prerequisite for students to complete their studies (Sari & Dahnial, 2022). Among the various features, discussion forums are a crucial component because they offer a space for participants to interact, ask questions, and discuss learning topics in depth (Rulinawaty et al., 2023). These forums are also often used as part of the assessment process. However, in practice, the effectiveness of discussion forums is often hampered by low participation rates and instructors' limited time to assess participants' contributions optimally.

As technology develops, AI is increasingly being integrated into online learning platforms, including MOOCs. The use of AI has the potential to assist the evaluation process and provide automated feedback, thereby reducing tutor workload and improving assessment efficiency. However, the use of AI in the context of learning evaluation remains controversial, particularly regarding fairness, ethics, privacy, and academic integrity (Gao et al., 2021; Halkiopoulos & Gkintoni, 2024; Usher & Barak, 2024). Improper implementation is feared to undermine learners' trust in the assessment process itself.

Findings from various studies indicate that technology, including AI, can have both positive and negative effects on learning quality (Gao et al., 2021; Halkiopoulos & Gkintoni, 2024; Usher & Barak, 2024). However, there is limited studies examining how participants—particularly students—interpret and respond to AI use in the learning evaluation process. Most studies focus on AI's role in providing writing feedback or as a learning assistant, while studies on students' perceptions of AI's use in evaluating discussion forums are relatively rare (Gao et al., 2021; Halkiopoulos & Gkintoni, 2024; Usher & Barak, 2024). Nevertheless, understanding student perceptions and attitudes is crucial in determining the success of AI implementation in learning (Ramdani et al., 2022; Warsihna et al., 2019).

This is further evidenced by the fact that previous studies still leave a significant gap regarding how AI affects social dynamics within discussion spaces (Bognar & Khine, 2025; Ma et al., 2024). The novelty of this research lies in its in-depth exploration of the psychological dimensions and student readiness regarding automated evaluation within digital social interaction spaces (discussion forums), which are often overlooked by techno-centric analyses (Alzahrani, 2023; Barrett & Pack, 2023; Steiss et al., 2024). Understanding student attitudes is of high urgency, as their perceptions will ultimately determine the sustainability and compliance of future AI-based academic policies (Kustiyowati et al., 2025; Schei et al., 2024).

Therefore, this study aims to describe students' perceptions of the use of MOOCs in learning and their attitudes toward the use of AI in discussion forum evaluation. This study also provides an overview of students' readiness to utilize AI technology as part of the learning process. The findings of this study are expected to provide a basis for educators and online learning program managers in formulating more appropriate and ethical policies and practices regarding the use of AI in academic evaluation.

Method

Research design

This study used a quantitative cross-sectional survey to describe students' perceptions of working on discussion forums in MOOCs and their attitudes toward the use of AI to evaluate these discussions (Warsihna et al., 2021). This design allows for the objective measurement of perception patterns at a single point in the data collection process.

Research participants

Participants in this study were active students at Universitas Terbuka who had completed MOOCs and participated in discussion forums, evaluated using AI. The four courses were developed using AI assistance in their discussion evaluation. A purposive sampling method was used in this study with the following criteria: (1) active students, (2) having taken at least one MOOC-based course, and (3) having interacted in discussion forums using AI-based evaluation. A total of 112 students met the criteria.

Instruments

The instrument used in this study was divided into three sections. The first section contained questions about participants' demographic data, such as age, gender, and employment status. The second section contained an instrument assessing students' perceptions of the use of MOOCs in their learning. Meanwhile, the third section included an instrument assessing students' attitudes toward the use of AI in evaluating discussion forums. These three sections were crucial to this study.

To measure students' perceptions of MOOC use in learning, researchers used an instrument developed by Kosasih et al. (2024) to assess the effectiveness of technology in online learning. This instrument consists of 12 statements that measure participants' perceptions

of the use of MOOCs in learning, rated on a 4-point Likert scale (strongly disagree to strongly agree). This instrument has a reliability coefficient of 0.001.a = 0.958, and the validity of each item has a value ranging from 0.70 to 0.87.

For the third section, on participants' attitudes toward discussion forums and the use of AI in discussion evaluation, the researchers used an instrument developed by Kosasih et al. (2025). This instrument was initially created to assess virtual learning tours in their study, but the researchers identified similarities in the objectives and the representation of relevant indicators, so it was selected. This study used six statements, modified to fit the study's context, with four response options on a Likert scale (strongly disagree to strongly agree). The results of the data trial showed that the reliability coefficient, α = 0.711, and the validity of each item ranged from 0.30 to 0.65. Thus, all instruments used are psychometrically sound

Research procedure

The study was conducted after obtaining ethical clearance from the ethics body overseeing the project. Researchers distributed a questionnaire to targeted participants over a three-week period in September 2025. The questionnaire was developed using the Google Forms platform, which is integrated into Universitas Terbuka's MOOCs system. The questionnaire also included informed consent, which aims to allow participants to participate in the study voluntarily and knowingly.

Data analysis

This study used descriptive analysis as its primary tool because the goal was to obtain a descriptive overview of the existing phenomenon. Therefore, the analysis used only examined data distribution patterns, including mean values, standard deviations, and score ranges obtained by participants. However, to strengthen the study's findings, inferential analyses, such as t-tests and ANOVA, were also conducted to examine differences in demographic variables that might be contributing factors. The researchers used SPSS version 26 for this analysis

Result and Discussion

Demographic Data of Participants

In the initial stage of analysis, this study presents the demographic characteristics of the participants to provide an overview of the profile of the students involved in the study (see Table 1).

Table 1. Demographic Data of Participants

Category	Frequency	Percentage (%)
Gender		
Male	53	47.3
Female	59	52.7
Age		
Under 20 years old	5	4.5
20 to 30 years	80	71.4
31 to 40 years old	18	16.1
41 to 50 years old	9	8
Current Domicile		
Countryside	39	34.8
Urban	73	65.2
Employment Status		
Student	78	69.7
Worker	31	27.7
Other	3	2.7
MOOC Usage Duration (Per Day)		
Less than 1 hour	31	27.7
1 to 4 hours	73	65.2
More than 4 hours	8	7.1
Location to Access MOOCs		
In the office	23	20.5
In public space	9	8
At home	80	71.4
Devices Accessing MOOCs		
Desktop	10	8.9
Mobile phone	25	22.3
Laptop	71	63.4
Tablet	6	5.4

Demographic data show that the participants in this study were 112 students, with a relatively balanced gender distribution: 47.3% male and 52.7% female. The majority are in the productive academic age range, with the 20-30 age group dominating at 71.4%. In terms of domicile, the majority live in urban areas (65.2%), while 34.8% live in rural areas. Participants' employment status also varies, with the majority (69.7%) being full-time students, followed by workers (27.7%) and other categories (2.7%). MOOC usage patterns indicate that most students spend 1-4 hours per day on the platform (65.2%) and do so primarily from home (71.4%). In terms of devices used to access MOOCs, laptops are the primary device (63.4%), followed by mobile phones (22.3%), desktops (8.9%), and tablets (5.4%). Overall, these characteristics reflect a relatively heterogeneous yet representative participant profile of MOOC users in higher education.

Descriptive Analysis of Student Perceptions in Using MOOCs

Descriptive analysis was conducted to describe the tendency of students' perceptions towards the use of MOOCs in learning. This analysis aims to provide an overview of how students assess the effectiveness and quality of using MOOCs as a learning medium. Mean

scores and standard deviations are presented for each item to identify perceptual trends and the degree of variation in participants' responses.

Table 2. Descriptive Results of Student Perceptions in the Use of MOOCs

Statement	M	SD
The MOOCs feature easy-to-follow displays.	3.30	.72
The MOOCs provide clear instructions for use, allowing them to be followed appropriately.	3.29	.71
MOOCs provide an easy-to-follow learning structure	3.39	.57
MOOCs are a stimulating learning medium.	3.32	.57
MOOCs are a flexible learning medium.	3.45	.59
MOOCs are easy to use for learning.	3.47	.55
MOOCs can be accessed quickly by users	3.39	.67
The delivery of material in MOOCs is exciting and not dull.	3.10	.66
The material/content presented in MOOCs is easy to understand	3.30	.58
The material in MOOCs meets learning needs.	3.25	.61
The material in MOOCs uses easy-to-understand language.	3.30	.58
MOOCs provide discussion forums that help deepen understanding of the learning material.	3.29	.54

Note. *M*: Mean, *SD*: Standard Deviation.

Based on the results in Table 2, students generally demonstrated a positive perception of the use of MOOCs in learning. This is indicated by the average scores for all items, which ranged from 3.10 to 3.47. The item with the highest average value was the statement "MOOCs are easy to use for learning" (*M* = 3.45, *SD* = .59) and "MOOCs are a flexible learning medium" (*M* = 3.45, *SD* = .59), indicating that the aspects of ease and flexibility are the elements most appreciated by students. In addition, the learning structure is easy to follow (*M* = 3.39), and platform accessibility (*M* = 3.39) also received high ratings, indicating that students found the learning process easy and followed the learning flow provided. Meanwhile, the lowest average score appeared for the item "The delivery of material in MOOCs is interesting and not boring" (*M* = 3.10, *SD* = .66), indicating that while perceptions remain positive, there is still room for improvement in the presentation of the material to make it more engaging and interactive. The relatively low standard deviation values across all items indicate that student perceptions tend to be homogeneous. Overall, these results illustrate that students view MOOCs as an effective, easy-to-use platform that adequately supports their learning needs.

Descriptive Analysis of Student Perceptions of Discussion Forums and AI Use

This descriptive analysis provides an overview of how students perceive the quality of discussion forums and their level of acceptance of the use of AI as part of an evaluation mechanism in the learning environment.

Table 3. Descriptive Results of Student Perceptions of Discussion Forums and AI Use

Statement	M	SD
Response time in responsive discussion forums.	3.46	.81
The responses in the discussion forum are relevant to the topic.	3.61	.61
The responses in the discussion forum motivated me to participate actively.	3.57	.68
The responses given in the discussion forum are easy to understand.	3.55	.65
Do you agree with the involvement of Artificial Intelligence (AI) in discussion forums?	3.35	.85
Does the involvement of Artificial Intelligence (AI) in discussion forums violate scientific ethics?	2.84	1.00

Note. *M*: Mean, *SD*: Standard Deviation.

The analysis results, shown in Table 3, indicate that students rated the discussion forums in MOOCs as functioning quite well, as indicated by average scores in the high category for most items. The item with the highest score was "The responses given in the discussion forums are relevant to the topics discussed" (*M* = 3.61, *SD* = .61), indicating that students felt the responses they received were appropriate to the discussion context. In addition, the responses given were also considered to motivate students to be more active in discussions (*M* = 3.57, *SD* = .68) and easy to understand (*M* = 3.55, *SD* = .65), indicating that the quality of interaction in the forum is considered adequate. The forum's responsiveness also received a positive rating (M = 3.46, SD = .81), although it showed slightly greater variation in responses than the other items.

Regarding perceptions about the use of AI, students tend to agree with the involvement of AI in discussion

forums (M = 3.35, SD = .85), while also indicating a greater level of doubt regarding ethical issues, reflected in a lower mean score on the item "AI involvement in discussion forums violates scientific ethics" (M = 2.84, SD = 1.00). The relatively higher standard deviation values for both AI-related items indicate a greater diversity of views among students. Overall, these results indicate that students view discussion forums as informative and supportive of learning, and demonstrate a relatively positive acceptance of the use of AI, although ethical concerns remain.

Comparative Analysis of Student Perceptions of MOOCs and AI-Assisted Discussion Forums Evaluation on Demographic Variables

To determine whether student perceptions of the use of MOOCs and discussion forums involving AI differed based on demographic characteristics, a cross-group comparison analysis was conducted. Demographic variables analyzed included gender, residence, employment status, daily duration of MOOC use, location of MOOC access, and device used (see Table 4).

The results of the One-Way ANOVA test showed that most demographic variables with more than two categories also did not produce significant differences. Regarding the access location and device used to access MOOCs, no significant differences were found in either the perception of MOOC use (location: F = 2.681, p = 0.073; device: F = 0.452, p = 0.716) as well as on the perception of AI-based discussion forums (location: F = 0.118, p = 0.889; device: F = 0.623, p = 0.602).

Table 4. Comparison of Students' Perceptions of MOOCs and AI-Assisted Discussion Forums Evaluation on Demographic Variables

Demographics Variable	95% CI				F/t		p-value	
	Lower		Upper					
	MOOCs	Disc_AI	MOOCs	Disc_AI	MOOCs	Disc_AI	MOOCs	Disc_AI
Gender	-2.94	1.67	-1.51	.73	-.547	-.685	.585	.495
Domicile	-3.59	-3.41	1.22	1.04	-.975	.553	.332	.582
Employment Status	.000	.000	.047	.146	.309	3.230	.735	.043**
Access Location	.000	.000	.132	.028	2.681	.118	.073	.889
Device	.000	.000	.054	.066	.452	.623	.716	.602

The only variable that showed a significant difference was employment status in students' perceptions of AI-based discussion forums evaluation (F = 3.230, p = 0.043), indicating that students, workers, and other categories differ in their perceptions of the role of AI in discussion forums evaluation. However, employment status did not show a significant difference in MOOC use overall (F = 0.309, p = 0.735). Overall, these findings indicate that students' perceptions of both MOOC use and AI involvement in discussion forums evaluation are relatively consistent across demographic groups, except for the employment status variable, which influences perceptions of AI in online discussions.

Discussions

The findings of this study indicate that participants had positive attitudes and perceptions toward MOOCs as an online learning medium. Participants' average scores were relatively high across various aspects, such as flexibility, ease of use, and a clear learning structure. This can be interpreted as indicating that MOOCs have met students' basic needs in the context of distance learning. These findings are indeed very much in line with various previous studies that also place significant emphasis on aspects described as fundamental capital in increasing the effectiveness of online learning, which will impact the quality of learning (Abhishek et al., 2025; Williams, 2024).

This study also provides information on students' positive assessments of the quality of interactions in discussion forums. Discussion forums are essentially online platforms designed to provide participants with a rich and meaningful learning experience, so the process must be optimized as much as possible. Relevant, easy-to-understand, and motivating responses in discussion forums are practical examples of what teachers can develop when building positive interactions with students. As evidenced by the scores obtained in this aspect, participants gave positive assessments. This can undoubtedly be a crucial point in the online learning process. These findings are also supported by several existing studies that emphasize the crucial role of interaction in discussion forums, which can increase not only student engagement in learning but also their understanding of the material being taught (Hollister et al., 2022; Jensen et al., 2021).

Regarding the use of AI in evaluating discussion forums, students demonstrated a relatively high level of acceptance. They agreed that AI could be involved in the evaluation process, although they remained cautious about ethical issues. Concerns about the ethics, fairness, and integrity of learning have also been highlighted in

various global studies on the use of AI in educational settings. The high standard deviation in perceptions of AI ethics indicates that students hold heterogeneous views, particularly regarding the fairness of assessment and the transparency of algorithms.

Group-comparison analysis showed that most demographic variables did not significantly affect student learning outcomes. This finding indicates that participants' experiences with technology were relatively uniform across user groups. However, significant differences were found in the variable of employment status and perceptions of AI use. Worker students may have different expectations or experiences with technology than full-time students, leading to varying views on AI-based evaluation. Overall, the study's findings confirm that integrating AI into MOOCs has the potential to improve evaluation efficiency and consistency, but still requires careful attention to ethical aspects, transparency, and user acceptance.

This study has several limitations. First, the use of purposive sampling limits the generalizability of the findings to a broader student population. Only students from one institution were involved, so their experiences with AI in evaluation may differ from those at other institutions. Second, the study used a cross-sectional design, which was unable to measure changes in perceptions over time. Third, the instrument used to evaluate perceptions of AI has undergone modifications, so while its reliability is adequate, certain variables may not be fully represented.

Nonetheless, this study has important practical implications. For educators, these results can serve as a basis for optimizing AI use to deliver consistent feedback and assessment. Educational institutions need to ensure that AI is used ethically and transparently to avoid eroding student trust. MOOC developers can also leverage these results to design AI-based evaluation systems that are more adaptive, accurate, and sensitive to user preferences.

Conclusion

This study concludes that students have a positive perception of the use of MOOCs and demonstrate a relatively high level of acceptance of the integration of AI in evaluating discussion forums. However, ethical aspects remain a major concern in the use of AI as an evaluation tool. Differences in perceptions based on employment status demonstrate the importance of considering user backgrounds in developing policies related to AI use. Therefore, this study makes an important contribution to understanding student readiness for AI use in learning evaluation and provides a foundation for more responsible and effective AI implementation in the future.

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Author Contributions

Conceptualization, and methodology, software, validation, formal analysis, investigation, resources, data curation, writing—original draft preparation, Jaka Warsihna, Zulmi Ramdani, Heri Kurniawan, Zulfikri, writing—review and editing, visualization, supervision, project administration, funding acquisition, Fauzy Rahman Kosasih, Mudayat, Ahmad Syaikhu. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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