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Communication-Driven Approaches to Improve Online Learning Experience in Distance Learning System

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ABSTRACT

This study investigates how communication driven approach can strengthen virtual mentoring through improved tutor responsiveness, interaction quality, and personalized feedback. Employing a mixed-methods design, data were drawn from usage analytics, online discussion logs, tutor profiles, and student academic records with 51 students enrolled which it had average participant about 33 students, wits one session during one semester complemented by semi-structured interviews and platform observations. Findings reveal delays in feedback, underutilization of interactive features, and student contributions dominated by brief, opinion-based responses lacking references. These limitations undermine communication quality and student engagement. The study highlights AI's potential to automate routine feedback, provide adaptive interaction, and reduce tutor workload, thereby enabling more meaningful engagement. Practical recommendations are offered for integrating AI into distance education systems to improve communication effectiveness, enhance learner satisfaction, and support academic success at scale. Universitas Terbuka, as Indonesia's leading public distance-learning institution, continues to face persistent challenges in ensuring effective communication and mentoring in the volatile, uncertain, complex, and ambiguous (VUCA) era.

1. Introduction

The VUCA era (volatility, uncertainty, complexity, and ambiguity) has fundamentally changed how universities worldwide perceive and practice instructional communication (Panthalookaran, 2022; Salakhova et al., 2021). Technological acceleration, shifting student demographics, the digital divide, and global economic fluctuations demand that higher education institutions adapt quickly and strategically (Ahuja, 2023; Mishra et al., 2024). Traditional pedagogical methods are increasingly seen as inadequate for preparing students to face complex, multidisciplinary challenges (Summerlee, 2018; Tran, 2013).

In a global context, distance education has become a key pillar, offering flexibility and broad access to learners across various regions (Guri-Rosenblit, 2005; Leontyeva, 2018). While this model allows learning to transcend geographical and time-based boundaries, its success is highly dependent

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on the effectiveness of instructional communication between faculty/tutors, content, and students. Instructional communication not only conveys information but also creates meaningful interaction, provides feedback, and builds social engagement that can reduce learning isolation.

In Indonesia, Universitas Terbuka (UT) serves as a prime example of large-scale distance education implementation. As the only state university fully adopting an open and distance learning (ODL) system, UT serves a student population dispersed throughout the archipelago with highly diverse social, economic, and learning needs (Jamil & Kusmaladewi, 2022; Sugilar, 2017). In this ecosystem, online tutorials are a core component of instructional communication, facilitating discussion, material clarification, and social interaction. Despite its strategic role, UT's online tutorial system still faces significant challenges.

First, tutor response times are slow and inconsistent. With a high volume of interactions, tutors often experience delays in providing replies, which can hinder learning momentum and decrease student motivation. Second, there is a lack of personalized guidance. The large tutor-to-student ratio limits tutors' ability to provide feedback relevant to individual needs. Third, tutors face an excessive workload, where one tutor may simultaneously guide hundreds of students, thereby reducing opportunities for in-depth interaction (Maini et al., 2020; Pardo et al., 2019). These challenges directly impact the quality of the learning experience. Delayed responses can trigger feelings of isolation and lower engagement, while generic guidance can reduce the material's relevance for the learner. In the long term, these conditions can affect academic achievement, student retention, and the overall effectiveness of distance learning.

To address these issues, Artificial Intelligence (AI) offers a transformative solution. With its ability to process large amounts of data and provide automated responses, AI can be used to automate answers to routine questions, provide more personalized feedback, and help tutors manage interactions more efficiently (Choi, 2021; Dangi et al., 2025). This allows tutors to shift their focus to high-value interactions, such as in-depth discussions and critical guidance. Although the literature on AI in education is growing, particularly in learning analytics and chatbots (Karmakar & Das, 2024), a significant research gap exists. The majority of studies focus on AI implementation in face-to-face or general contexts, without exploring its use to solve specific problems in large-scale asynchronous communication, especially in developing countries (Nye et al., 2021; Olanike Abiola Ajuwon et al., 2024b). Furthermore, few studies integrate real communication data with an analysis of human factors, such as digital competence and tutor attitudes, in designing AI interventions.

This study aims to fill this gap through two main contributions. First, it conducts a comprehensive analysis of the virtual communication patterns between tutors and students at Universitas Terbuka to identify the most potential intervention points for communication driven approachI. Second, it examines the readiness of technology based human relation—including digital skills, perceptions, and tutor attitudes—as a critical prerequisite for the successful adoption of AI for improving the system. Thus, this research not only maps the needs for optimizing instructional communication but also provides a practical framework for distance education institutions to implement AI effectively and sustainably. This approach is expected to contribute on two levels. At the theoretical level, this research expands the understanding of AI's role in supporting instructional communication within the ODL context in the VUCA era. At the practical level, the research findings can serve as a strategic guide for universities and distance learning institutions to improve the quality of guidance, student engagement, and academic achievement through the pedagogically relevant use of AI.

2. Method

This study employed an explanatory sequential mixed-methods design, chosen because online communication in distance education contains both measurable behavioral patterns and subjective relational dynamics. The design began with quantitative analysis of communication patterns to identify key trendency, identifying frequency of amount student participation as descriptive statitistic display, followed by qualitative inquiry to provide deeper contextual explanations. This approach

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allowed the research to capture both breadth and depth, ensuring that numerical indicators of engagement were complemented by the voices and experiences of participants.

The study was conducted at Universitas Terbuka (UT), Indonesia's largest open and distance learning institution, focusing on Mass Communication online tutorials during the 2023/2024 semester. Participants included three tutors and 51 enrolled students, with an average of 33 active in discussions. Although modest in scale, this purposeful case sample was considered sufficient to provide an in-depth perspective on UT's mentoring communication practices. Key informants involved in the design and operation of the online tutorial system were also consulted to enrich the analysis.

Multiple sources of data were collected to ensure triangulation and strengthen validity. Learning Management System (LMS) analytics provided quantitative data on user logins, interaction times, tutorial rubrics, and assignment activity. Additional participant data were drawn from online discussion logs, tutor profiles, and student demographic and academic information. Semi-structured interviews were conducted with tutors and institutional informants to capture perspectives on communication challenges, workload, and mentoring effectiveness. Complementary observations of online forum activity were also carried out to contextualize the interaction patterns. All procedures adhered strictly to UT's data privacy standards and institutional approval processes.

Data analysis was conducted in two phases. Quantitative data were examined using descriptive statistics, which describe trend between tutor characteristics and student engagement. Qualitative data, consisting of interview transcripts and discussion logs, were analyzed thematically using NVivo software. This involved iterative coding cycles to identify recurring themes related to communication effectiveness, personalization limitations, and the role of workload and digital competency. Credibility of findings was enhanced through data triangulation across sources, member checking with participants, and inter-coder agreement discussions within the research team.

3. Results and Discussion

This section presents the quantitative findings from the Mass Communication online tutorial at Universitas Terbuka during the 2022/2023 semester. Data were extracted from the Learning Management System (LMS) and covered eight tutorial sessions, each consisting of discussion initiations and responses from both students and tutors. A total of 51 students were officially registered for the course. For each session, the number of active participants, participation percentage, dominant contribution type, and average tutor response time were recorded. *Active participants* refer to students who posted at least one message in the discussion forum during a given session. *Participation percentage* was calculated by dividing the number of active participants by the total number of registered students, then multiplying by 100. The *dominant contribution type* was identified based on the most frequently observed form of student response (e.g., opinion, statement, or question). *Tutor response time* indicates the average time taken by the tutor to respond to student posts, measured in hours from the time of the student's contribution.

Table 1 summarizes these findings. Across all sessions, the average number of active participants was 33 students, corresponding to an overall average participation rate of 60.8%. Participation varied across sessions, with the highest rate in Session 3 (76.5%) and the lowest in Session 7 (56.9%). The dominant contribution type alternated between opinion-based and statement-based responses. The average tutor response time across all sessions was 12 hours, with fluctuations between 10 and 15 hours depending on the session.

Table 1. Participation and Response Summary

Session	Registered Students	Active Participants	Participation (%)	Dominant Contribution Type	Avg. Tutor Response Time (hrs)
1	51	37	72.5	Opinion	10
2	51	35	68.6	Opinion	13
3	51	39	76.5	Opinion	12
4	51	32	62.7	Statement	11

5	51	30	58.8	Statement	15
6	51	31	60.8	Opinion	12
7	51	29	56.9	Opinion	14
8	51	31	60.8	Statement	12

As shown in Table 2, the average student participation rate across eight sessions was 60.8%, with participation ranging from 56.9% to 76.5%. The dominant type of contribution alternated between opinion-based and statement-based responses, indicating limited depth of engagement. The average tutor response time was 12 hours, suggesting a lack of immediacy that may reduce the effectiveness of dialogue and feedback.

Across all sessions, an average of 33 students actively participated, which equates to an overall participation rate of 64.7%. The highest participation was observed in Session 3 (76.5%), while the lowest was in Session 7 (56.9%). This indicates moderate but fluctuating levels of engagement throughout the semester. In terms of tutor responsiveness, the average response time was 12.4 hours, ranging between 10 and 15 hours depending on the session. The shortest response time occurred in Session 1, while the longest was in Session 5. This suggests that although tutors were generally responsive within half a day, the consistency of feedback varied across sessions. The dominant contribution type alternated between opinion-based responses and short statements. Opinion-based responses were more frequent in five sessions, while statement-based responses were predominant in three sessions. This pattern suggests that while students were willing to share their views, their contributions were often limited in depth and did not always align with the instructional prompts.

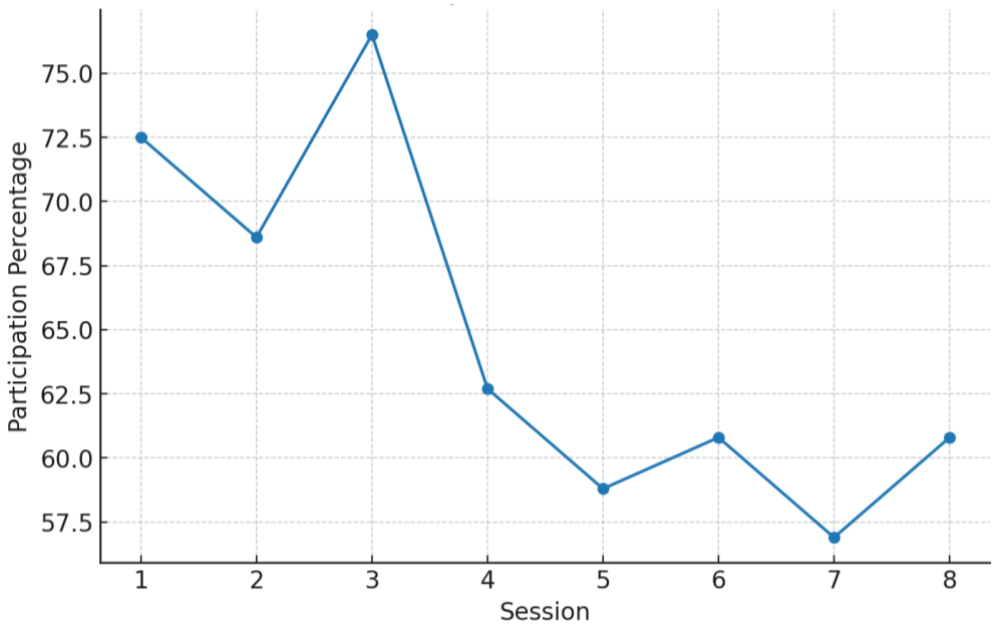

Fig. 1. Student Participation Rates

Student participation demonstrated a moderate but fluctuating pattern, with the highest engagement recorded in Session 3 (76.5%) and the lowest in Session 7 (56.9%). Although the average participation rate remained above 60%, the inconsistency across sessions suggests challenges in sustaining student activity throughout the semester. This fluctuation may reflect differences in session topics, student workload, or motivational factors.

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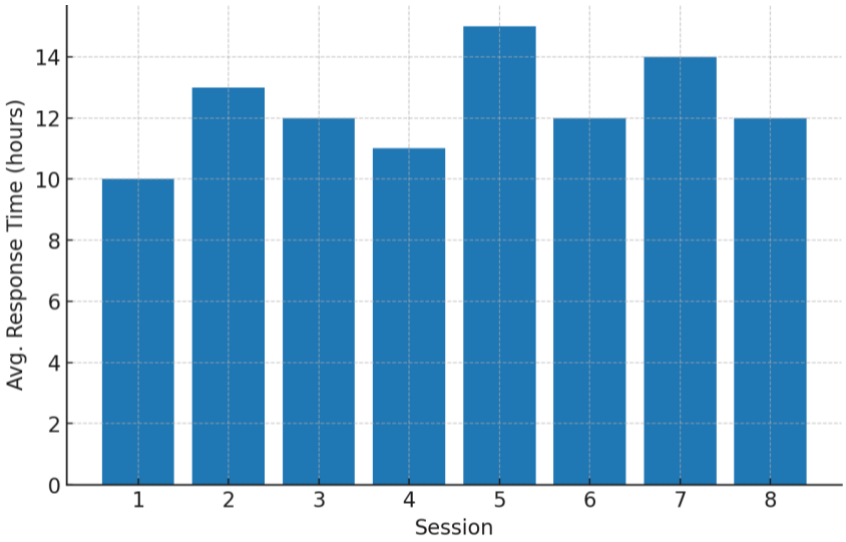

Fig. 2. Tutor Response Time per Session

llustrates tutor response times, which averaged 12 hours but ranged between 10 and 15 hours. While this indicates that tutors generally provided feedback within half a day, the observed variability suggests that response timeliness was not uniform. Longer delays, particularly in Sessions 5 and 7, potentially reduced the immediacy and effectiveness of communication. Consistency in feedback delivery is therefore an important area for improvement.

Together, these descriptive results underscore the importance of consistent interaction strategies to enhance both student participation and tutor responsiveness. They also provide a quantitative foundation for interpreting the qualitative patterns observed in communication behaviors, as discussed in the subsequent section on communication deficiencies.

Observed Communication Patterns and Quality Deficiencies

Analysis of discussion forum content and tutor interview data indicated notable patterns in communication quality. Across sessions, between 70% and 80% of participating students provided responses that did not fully address the instructional prompts or assignment requirements. Common patterns included unsystematic answers, omission of key points outlined in the instructions, and limited adherence to provided guidelines.

Tutors also reported delays or absence of responses to certain instructional messages. These communication patterns were consistent across multiple sessions, indicating a recurring tendency among students to focus on partial aspects of the discussion topics rather than engaging comprehensively with the assigned tasks.

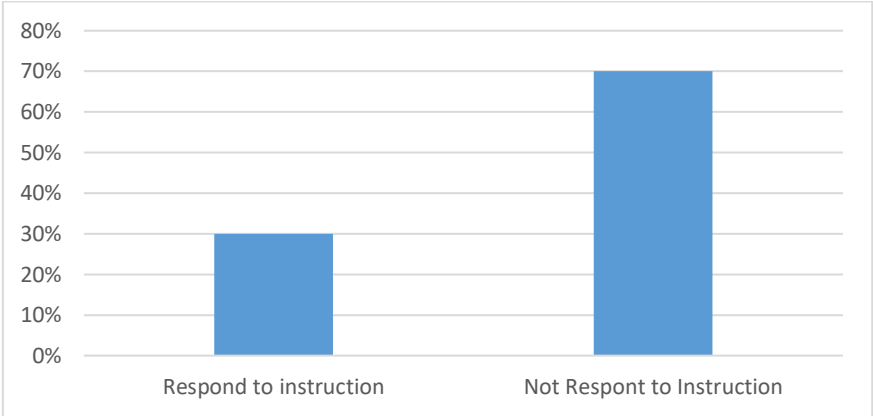

Fig. 3. Schema

Content analysis of student responses during online tutorials identified recurring patterns in participation. Many replies were short, delayed, or lacked direct relevance to the instructional prompts. Frequently used terms in tutor feedback included "late," "brief," and "irrelevant," reflecting the nature of the submissions. Several responses consisted of copy-pasted material, unrelated content, or omitted key points from the instructions. Other descriptors recorded during analysis—such as "inactive," "disconnected," and "unengaged"—indicated limited interaction by some students. These patterns were consistent across multiple sessions, with instances of unanswered prompts, incomplete replies, and limited dialogue between participants.

Fig. 4. Word

Factors Hindering Communication Effectiveness

Analysis of data from online tutorial activities identified several recurring factors associated with reduced communication quality, summarized in Table 2. These factors emerged from both platform usage analytics and qualitative data from tutor interviews and forum observations.

Table 2. Factors Observed in Online Tutorial Communication at Universitas Terbuka

Factor	Observed Condition
Goals and Targets	Online tutorials are designed to support students in understanding course material through eight initiations and three assignments per semester. However, student contributions frequently deviated from the discussion themes outlined by the tutor.
Communicator–Audience	Tutors and students alternated roles as senders and receivers of information through introductions, initiations, responses, and feedback. While interaction occurred, its depth and reciprocity varied greatly.
Media/Channel	The platform supports text, video, and image-based communication, yet usage remained predominantly text-oriented. Features for richer media interaction were rarely utilized.
Messages/Content	Many student responses did not address the specific prompts provided by tutors. Responses often included copied material from textbooks or online sources, brief opinions without references, or unrelated comments.
Relationship/Involvement	Student–tutor relationships appeared formal and distant, with low levels of personal engagement. Some students were unaware of their assigned tutor's identity.
Feedback	Feedback exchanges were constrained by response timeframes of one to two weeks, reducing immediacy and limiting opportunities for sustained dialogue.

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In terms of Goals and Targets, participation records showed that many student responses did not correspond with the discussion prompts. The Communicator–Audience role alternation was present but varied in consistency, with some threads showing extended dialogue and others minimal interaction. For Media/Channel usage, the text-based mode dominated communications despite the availability of video and visual tools. Regarding Messages/Content, a recurring pattern of brief, formulaic, or off-topic contributions was observed, often without citations or connection to the learning objectives. In the Relationship/Involvement dimension, the tone of exchanges was generally formal, with limited evidence of rapport-building. Finally, the Feedback process was affected by long intervals between messages, sometimes extending up to two weeks, reducing the responsiveness of exchanges

Discussion

3.1. Systemic Gaps in Communication and Mentoring

The findings reveal persistent gaps between the intended design of Universitas Terbuka's (UT) online tutorial system and its actual implementation, particularly in the domain of communication and mentoring. While the system was designed to facilitate meaningful interaction between tutors and students across Indonesia's dispersed geography, operational realities show that structural and pedagogical adjustments have not kept pace with evolving technological possibilities. This echoes who emphasize that distance learning systems must undergo regular re-evaluation to remain effective in dynamic learning contexts. At UT, a reliance on long-established processes, without critical reformulation, has allowed communication inefficiencies to persist (Chen et al., 2019; Kim & Ko, 2017). For example, human-to-human interaction—essential for building trust, engagement, and academic discourse—remains inconsistent and often subordinated to procedural requirements. These gaps are systemic, embedded in institutional routines and policies that have not fully addressed the complexity of fostering social and cognitive presence in large-scale asynchronous environments (Schweinsberg & Garivaldis, 2020).

From a mentoring perspective, tutors function primarily as content deliverers rather than facilitators of dialogue, limiting opportunities for formative feedback and personalized support. While the *Community of Inquiry* framework suggests a balance between teaching, cognitive, and social presence, the UT model leans heavily on teaching presence via structured initiations and grading, with insufficient scaffolding to promote sustained, student-led discussion. This imbalance not only diminishes the potential for collaborative knowledge construction but also narrows the scope for mentoring relationships to develop. In practice, these systemic constraints result in predictable, transactional interactions that fail to adapt to student needs in real time (Arora et al., 2023a; Bennett & Burridge, 2018).

The theoretical implication is clear: without systemic adaptation, even robust technological infrastructures cannot ensure communicative effectiveness in distance education. Practically, UT and similar institutions need to embed cyclical evaluation mechanisms into their system design, allowing for iterative refinements based on real-time communication analytics. Policy-level changes—such as mandating periodic platform audits, diversifying communication modalities, and integrating mentoring as a core performance metric—could close these systemic gaps and align practice more closely with the system's original pedagogical intentions.

3.2. Disparity in Communication Quality and Engagement

Despite participation rates averaging 64, 7 %, qualitative analysis shows that much of the engagement is superficial, characterized by opinion-based responses lacking proper references or substantive elaboration. This finding aligns with who noted that high participation does not necessarily equate to deep learning in online environments(Jian & Yang, 2015; C. Li & Chen, 2024). At UT, contributions were often brief, off-topic, or repetitive, suggesting that students view participation as a procedural requirement rather than a meaningful academic exchange. This transactional approach undermines the interactive potential of discussion forums, reducing them to compliance checklists rather than spaces for intellectual engagement.

The disparity between quantity and quality of communication is compounded by delayed tutor responses—sometimes extending up to two weeks. Timely feedback is a critical determinant of student motivation in online learning (Filius et al., 2019; Pardo et al., 2019). The psychological distance created by slow response times diminishes relational trust and disengages students from the learning process(Martínez-Argüelles et al., 2015; Tabares et al., 2022). In contexts like UT's, where geographic dispersion already challenges immediacy, such delays exacerbate feelings of isolation. Furthermore, the prevalence of one-time contributions per session suggests limited follow-up dialogue, curbing the iterative exchange necessary for deeper understanding.

In terms of theory, these findings reinforce the need to distinguish between *presence* and *engagement* in online learning metrics. Presence refers to logging in and making a post; engagement involves sustained, meaningful interaction that advances collective understanding. Practically, the disparity points to the importance of training tutors to model substantive contributions, use probing questions to extend discussion, and acknowledge student posts promptly to maintain momentum. Institutional policies could mandate maximum response timeframes and integrate peer-moderation roles to stimulate continuous dialogue.

3.3. Challenges in Technology, Text, and Context Integration

The UT online tutorial platform was designed with capabilities for text, video, images, and interactive media, yet both tutors and students overwhelmingly relied on text-only communication. This underutilization mirrors who observed that the mere availability of multimedia tools does not guarantee their integration into pedagogy(Vlachopoulos & Makri, 2019b). Several factors contribute to this phenomenon at UT: limited user training, lack of clear pedagogical models for multimedia use, and possibly infrastructural constraints such as bandwidth limitations in remote areas.

From a contextual perspective, the overreliance on text constrains the richness of communication. In fields such as mass communication, where the visual and auditory dimensions of media are integral to the subject matter, the absence of multimedia interaction is a missed opportunity to connect theory with practice(Kumar et al., 2021; Lohmeyer, 2024; McGee & Reis, 2012). Moreover, text-only exchanges tend to formalize and rigidify communication, making it harder to convey tone, nuance, and interpersonal warmth—elements that are vital for building social presence(Tabares et al., 2022)

The lack of integration between technology, text, and context also limits the system's adaptability. effective online learning environments must harmonize these three elements to create immersive, responsive learning experiences(Bower et al., 2015; Craig, 2022). In UT's case, the platform's latent potential remains untapped, reinforcing static communication patterns. Addressing this challenge requires more than technical upgrades; it demands a cultural shift in pedagogical practice. Tutors and students alike need structured opportunities to experiment with multimedia tools in low-stakes settings, alongside targeted training on aligning media choices with learning objectives.

3.4. Implications for AI Optimization and Future System Design

The observed deficiencies in communication quality, feedback timeliness, and personalization highlight a strategic opportunity for integrating Artificial Intelligence (AI) into UT's online tutorial system. AI has the potential to act as both a diagnostic and intervention tool, addressing pain points identified in this study (Arora et al., 2023b; Karmakar & Das, 2024; Surugiu et al., 2024; Tripathi, 2024). For instance, AI-driven analytics could flag students at risk of disengagement based on participation patterns, prompting tutors to intervene before withdrawal occurs (Carin, 2020; Olafare, 2024; Taylor, 2023). Similarly, AI-powered chatbots could handle routine queries, provide instant feedback on basic assignments, or suggest relevant resources, freeing tutors to focus on higher-order mentoring.

These possibilities align with who argue that AI can enhance personalization and scalability in distance education (Pesovski et al., 2024; Yu et al., 2017). However, technology is not a panacea; its successful integration depends on thoughtful design, adequate training, and supportive policy frameworks. In UT's context, AI implementation should be guided by three principles: augmenting

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rather than replacing human interaction, ensuring transparency in algorithmic decisions, and safeguarding student data privacy.

From a theoretical standpoint, the move toward AI-optimized systems reflects a broader shift in distance education from reactive to proactive communication management(Akavova et al., 2023; Kit Ng et al., 2023). Practically, UT could pilot AI tools in selected courses, evaluating their impact on communication metrics and student outcomes before scaling institution-wide. Policy implications include the need for updated guidelines on digital ethics, data governance, and the redefinition of tutor roles in AI-enhanced environments (Lancaster, 2023).

In conclusion, the four dimensions explored—systemic gaps, disparities in engagement, challenges in integrating technology-text-context, and opportunities for AI optimization—collectively underscore that effective communication in large-scale distance education is as much a human challenge as it is a technological one. Addressing these issues demands an integrated strategy that aligns system design, pedagogical practice, and technological innovation.

4. Conclusion

This study provides a comprehensive examination of the dynamics and challenges of virtual communication and mentoring within Universitas Terbuka, Indonesia's largest distance education institution. The findings reveal that although student participation rates in online tutorials are relatively high, the quality of interaction remains limited, with contributions often dominated by opinion-based responses lacking references, delayed engagement, and fragmented exchanges that disrupt the intended flow of learning. Key barriers include high tutor workloads limiting personalized guidance, underutilization of available technological features, and psychological factors that hinder student motivation and sustained engagement. The absence of critical re-evaluation of the online tutorial system over time has perpetuated these inefficiencies, highlighting the urgent need for systemic improvements. By identifying these communication gaps in detail, this study contributes new empirical evidence to the literature on distance learning, offering a clearer understanding of the complex interplay between human and technological factors in large-scale virtual education environments.

The results also underscore the potential of Artificial Intelligence (AI) as a strategic intervention to address these persistent issues. AI-powered tools could be suggested to automate responses to routine queries, provide targeted feedback, detect patterns of disengagement, and guide students toward more substantive, academically rigorous participation. Such integration would not only optimize tutor workload but also enhance the adaptability and responsiveness of the tutorial system. While the study's reliance on existing usage analytics and a small qualitative sample limits generalizability, the triangulation of multiple data sources strengthens its validity. Future research should focus on designing, implementing, and evaluating AI-driven mentoring models that directly respond to the communication deficiencies identified, with the aim of improving engagement quality, fostering deeper learning, and informing policy development for distance education systems in comparable contexts.

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