

Artificial Intelligence (AI) Usage and Critical Thinking Skills of Second Year BSED-English Students

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Abstract: This study examined the relationship between artificial intelligence (AI) usage and critical thinking skills among second-year BSED-English students. Utilizing a descriptive-correlational research design, data were collected from 89 respondents selected through Raosoft sampling. Statistical analysis revealed a moderate positive correlation between AI usage and critical thinking skills, suggesting that students who frequently engage with AI tend to exhibit stronger cognitive abilities. However, findings indicate that while AI is frequently used for basic academic tasks due to its accessibility, its potential to support deeper understanding remains underutilized, highlighting the need for more guided and meaningful integration in learning. Given these findings, educators should encourage proactive AI usage, integrate AI-driven formative assessments, and provide digital literacy training. Academic institutions should improve AI accessibility and develop AI literacy programs that emphasize cognitive skill development. Future research should explore AI tools that enhance students' ability to comprehend complex texts, recognize relationships between ideas, and modify written structures. Optimizing AI integration in education may enhance cognitive development and learning experiences.

Keywords: Education, Artificial Intelligence Usage, Critical Thinking Skills, Descriptive-Correlational Design, Statistical Analysis, Cognitive Development, Philippines.

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I. INTRODUCTION

The enhancement of critical thinking skills among students in higher education has emerged as a significant concern in contemporary educational research. While critical thinking is regarded as a cornerstone of academic success and professional competence, numerous studies indicate that students often demonstrate inadequate levels of this skill upon entering university. Jimenez et al. (2021, as cited in Witorsa & Muhammad, 2023) reported that approximately 85% of educators perceive a widespread lack of critical thinking ability among students. This figure highlights not only the scale of the problem but also its implications for higher education institutions tasked with preparing graduates for the complex demands of the modern world. The deficiency in critical thinking manifests in several ways. Students frequently rely on rote memorization rather than engaging in deeper analysis, exhibit difficulty in synthesizing information across disciplines, and struggle to evaluate evidence. Such limitations restrict their capacity to navigate real-world

challenges that demand problem-solving, adaptability, and informed decision-making. This issue suggests that current pedagogical approaches may not sufficiently foster higher-order thinking, raising questions about the effectiveness of instructional practices in bridging the gap between secondary and tertiary education. Ultimately, the lack of critical thinking among incoming university students poses a dual challenge: it undermines academic achievement, compromises the broader mission of higher education to cultivate informed, independent, and socially responsible individuals. Addressing this gap, therefore, requires systemic efforts integrating curriculum design, faculty development, and institutional policy to ensure that critical thinking is not treated as an incidental outcome but as a central objective of the educational process.

In addition, critical thinking skills are widely recognized as fundamental to higher education because they enable students to analyze information objectively, formulate sound judgments, and solve multifaceted problems

effectively. Empirical research confirms that critical thinking plays a decisive role in supporting student achievement, particularly in problem-solving contexts where analytical reasoning and evaluative skills are indispensable (Ekayanti, Prayogi, & Gummah, 2022). Beyond its academic utility, critical thinking has been identified as a crucial competency for evaluating information and making informed decisions across both educational and real-world domains (Quinn et al., 2020; Shanta & Wells, 2022). These competencies are increasingly important in an era characterized by rapid information exchange and complex global challenges, where the ability to discern credible evidence and reason systematically can significantly impact personal, professional, and civic outcomes.

Moreover, the cultivation of critical thinking extends beyond cognitive gains. Research indicates that it fosters intellectual curiosity, stimulates creativity, and equips learners with transferable life skills that contribute to long-term success (Raj et al., 2022). Students who engage in critical thinking are better prepared to approach problems from multiple perspectives, challenge assumptions, and adapt to novel situations—skills that are essential in both academic settings and in the demands of contemporary workplaces. Thus, critical thinking is not only a marker of academic excellence but also a foundational attribute for lifelong learning and responsible citizenship.

While a limited number of studies have explored the role of artificial intelligence (AI) in educational contexts (Ghedir & Gasmi, 2024; Aymen & Zakarya, 2024; Essien et al., 2024), there remains a lack of comprehensive research specifically examining the influence of AI on students' critical thinking skills within the local context. This gap in the literature underscores the necessity of conducting localized studies that investigate how AI tools shape cognitive development and academic performance. The absence of similar studies conducted in the local setting highlights both the relevance and urgency of this research in contributing to the growing body of knowledge on AI integration in education.

This study, therefore, seeks to address this research gap by examining the relationship between AI usage and critical thinking skills among second-year BSED-English students. Specifically, the study is guided by three objectives: first, to describe the extent of AI usage in terms of functionality, availability, and complexity; second, to assess the level of students' critical thinking skills across the dimensions of remembering, understanding, applying, analyzing, evaluating, and creating; and third, to determine whether there is a significant relationship between AI usage and critical thinking skills. In line with these objectives, the study advances the hypothesis that no significant relationship exists between AI usage and the critical thinking skills of second-year BSED-English students.

The significance of this research extends across multiple dimensions. From a global perspective, the study contributes to the expanding literature on AI in education, particularly by offering empirical insights into how AI

impacts critical thinking. These findings provide a foundation for shaping future educational strategies and policies that respond to technological advancements in higher education. From a societal standpoint, the research offers practical value by presenting a framework through which students can enhance essential cognitive skills, equipping them to navigate the complexities of an AI-driven world.

Moreover, the study carries implications for diverse stakeholders. For students, it provides strategies to strengthen critical thinking while optimizing the use of AI in academic tasks. For parents, it offers evidence-based insights into how they can better support their children's learning in an environment increasingly mediated by technology. For educators and administrators, the results can inform the design of innovative, engaging, and effective pedagogical practices and policies that integrate AI in ways that foster higher-order thinking rather than diminish it. Finally, for future researchers, this study establishes a groundwork upon which further investigations may be built, encouraging exploration of additional variables that influence student success and examining the broader implications of AI in educational settings.

II. REVIEW OF RELATED LITERATURE

A. AI Tools Usage

The independent variable in this study is artificial intelligence (AI) usage, which is broadly understood as the application of AI-based tools and platforms to improve the quality, accessibility, and comprehension of academic tasks. Scholars highlight that AI has become increasingly integrated into educational contexts, offering opportunities to enhance both learning processes and outcomes (Bancoro, 2024). He conceptualizes AI usage along three dimensions—functionality, availability, and complexity—which together provide a multidimensional framework for examining how students interact with emerging technologies in their academic pursuits.

Functionality reflects how students utilize AI to perform and improve specific academic tasks. For instance, AI tools may be employed for generating and refining ideas, proofreading and editing written outputs, organizing content, and providing alternative explanations to strengthen mastery of subject matter. Research on educational technologies has similarly noted that when AI is used functionally, it can scaffold student learning and increase efficiency in academic work (Bancoro, 2024).

Availability concerns the accessibility and compatibility of AI across platforms and devices. It highlights the infrastructural conditions, such as internet connectivity and updated software, that enable or constrain student engagement with AI. Studies suggest that the availability of AI resources directly influences whether students can integrate these tools consistently into their academic practices, with inequities in access potentially limiting educational benefits (Bancoro, 2024).

Complexity emphasizes how students employ AI to simplify challenging or abstract concepts. This includes breaking down complex theories, generating step-by-step solutions, and presenting information in ways that promote deeper comprehension. In this sense, AI serves not only as a technical tool but also as a cognitive aid that supports conceptual understanding and critical engagement with academic content (Bancoro, 2024).

By framing AI usage through functionality, availability, and complexity, scholars provide a structured means of analyzing its educational impact. This operationalization underscores the potential of AI to act as both a practical support for academic tasks and an intellectual partner in fostering higher-order thinking. Thus, understanding AI usage is central to evaluating its possible relationship with students' cognitive development, particularly in the area of critical thinking.

B. Critical Thinking Skills

The dependent variable in this study is critical thinking skills, which are widely regarded as essential competencies for higher education and lifelong learning. Critical thinking encompasses a set of cognitive abilities that enable individuals to recall, comprehend, apply, analyze, evaluate, and generate new knowledge in ways that foster comprehension, judgment, and innovation (Kobylarek et al., 2022). Within the framework of Bloom's taxonomy, these abilities are measured through six key indicators that represent different levels of cognitive processing.

Remembering involves the ability to recall previously learned information, concepts, or facts that serve as the foundation of knowledge. Understanding extends this by enabling learners to interpret meaning, explain ideas, and engage in informed discussions. Applying focuses on the capacity to use knowledge in practical contexts, including verifying information critically and integrating it into daily experiences. Analyzing involves examining information in detail, identifying relationships, and distinguishing between main ideas and supporting details. Evaluating emphasizes the capacity to critically assess the accuracy of information, weigh evidence, and justify one's reasoning or perspectives. Finally, creating represents the highest level of cognitive engagement, where learners generate new ideas, reorganize knowledge, and establish original connections in texts or problem-solving contexts (Kobylarek et al., 2022).

Research consistently affirms that critical thinking is indispensable for academic success and real-world problem-solving. It equips students with the capacity to engage in reflective inquiry, navigate ambiguity, and make informed judgments across diverse contexts. However, despite its importance, critical thinking remains underdeveloped in many higher education settings. As noted earlier, studies have suggested that most students entering university display limited critical thinking skills, often relying on memorization rather than higher-order reasoning. While prior research has begun to investigate the influence of artificial intelligence in educational contexts (Ghedir & Gasmi, 2024; Aymen & Zakarya, 2024; Essien et al., 2024), comprehensive

examinations of how AI usage affects critical thinking, particularly within local contexts, remain scarce.

This study therefore seeks to address this research gap by providing localized insights into the relationship between AI usage and students' critical thinking skills. By situating the inquiry within the context of second-year BSED-English students, the study not only contributes to the global literature on AI and education but also offers context-specific findings that may inform curriculum design, teaching strategies, and institutional policies. The lack of comparable local studies highlights the urgency of this research and underscores its potential significance in advancing both scholarly understanding and educational practice.

C. Correlation Between Measures

A recent scholarship has increasingly focused on the correlation between artificial intelligence (AI) usage and the development of critical thinking skills, revealing consistent positive associations. Esguera, Libiran, Quiambao, and Gabriel (2024) found that students who demonstrated greater awareness, practical application, evaluation, and ethical considerations in their AI usage also exhibited higher levels of critical thinking. Their findings underscore that the depth of engagement with AI—not merely its presence in academic contexts—is a strong predictor of cognitive growth.

Complementing these results, Abdalgane and Othman (2023) investigated the role of AI integration in English as a Foreign Language (EFL) classroom. Their study revealed that AI-supported writing activities enhanced both critical thinking and writing proficiency by helping students refine ideas, improve coherence, and strengthen the clarity of their arguments. This suggests that AI can be effectively positioned as a pedagogical tool that not only supports language learning but also cultivates higher-order thinking skills.

In a similar vein, Fabio, Plebe, and Suriano (2024) examined the impact of regular interaction with AI chatbots such as ChatGPT. Their study concluded that AI-mediated dialogue fosters reflective thinking by encouraging students to engage in iterative problem-solving and explore multiple perspectives. By simulating meaningful conversations and providing scaffolding in real scenario, chatbots contribute to the development of critical and analytical reasoning. Taken together, these studies provide strong evidence that AI usage is positively correlated with the enhancement of critical thinking. The convergence of findings across different contexts—general academic use (Esguera et al., 2024), language learning environments (Abdalgane & Othman, 2023), and AI-mediated dialogue (Fabio et al., 2024)—suggests that AI can function as both a cognitive tool and a learning partner. This body of research strengthens the rationale for examining AI usage in relation to critical thinking in localized contexts, where cultural, institutional, and pedagogical factors may shape the nature of this relationship.

III. MATERIALS AND METHODS

This study employed a quantitative-correlational research design, making use of survey questionnaires as the main instruments for data collection. The design was selected because it enabled the researchers to measure the levels of artificial intelligence (AI) usage and critical thinking skills, and to determine the relationship between these two variables in a systematic and statistically verifiable manner.

Two adapted instruments were utilized. The first was the Artificial Intelligence Usage Questionnaire, adapted from Bancoro (2024), which measured AI usage through three indicators: functionality, availability, and complexity. The second was the Critical Thinking Skills Questionnaire, adapted from Kobylarek et al. (2022), which assessed critical thinking across six cognitive domains based on Bloom's taxonomy: remembering, understanding, applying, analyzing, evaluating, and creating. These instruments were selected and adapted to ensure alignment with the study's objectives and to capture both the practical and cognitive dimensions of the constructs under investigation.

The responses were interpreted using weighted mean values that provided descriptive categories. A mean score ranging from 4.20 to 5.00 was interpreted as "Always," reflecting a high level of consistent engagement or application. Scores between 3.40 and 4.19 were categorized as "Often," indicating regular AI usage or frequent demonstration of critical thinking skills. Mean values between 2.60 and 3.39 corresponded to "Sometimes," denoting occasional engagement or moderate application. Scores from 1.80 to 2.59 were classified as "Rarely," suggesting limited usage or infrequent demonstration. Finally, scores ranging from 1.00 to 1.79 were interpreted as "Never," indicating no engagement with AI tools or absence of critical thinking skills.

Through this design, the study was able to quantify both AI usage and critical thinking skills, describe their levels among second-year BSED-English students, and test whether a significant correlation existed between the two variables. This approach provided a structured basis for analyzing how AI integration in education may influence the development of higher-order thinking skills.

On the other hand, this study was conducted in a local college in Region XI, Mindanao. Meanwhile, the respondents of this study were second-year Bachelor of Secondary Education (BSED) major in English students, with a total population of 123. Using the Raosoft sample size calculator, it was determined that 94 participants would be sufficient to provide reliable results at a 95% confidence level and a 5% margin of error. This sample size was considered adequate based on the recommendation of Fraenkel, Hyun, and Wallen (2022), who emphasized that a minimum of 30 respondents is necessary for descriptive-correlational studies, since smaller samples may not adequately capture the degree of correlation. To ensure fairness in representation, the study employed simple random sampling, a method that gives each member of the population an equal chance of being selected and

minimizes bias (Thomas, 2020). In line with the study's objectives, specific inclusion and exclusion criteria were established. The inclusion criteria required that respondents be bona fide second-year BSED-English students enrolled at the institution, have prior experience in using AI tools such as ChatGPT and other chatbots, and express willingness to participate in the study. Conversely, students who clearly expressed their unwillingness to participate or who withdrew during the administration of the survey questionnaires were excluded from the final sample. These measures ensured that the participants were both representative of the population and directly relevant to the research focus, thereby strengthening the reliability and validity of the findings.

In this study, data were collected and analyzed using a descriptive-correlational design, a non-experimental approach suited for examining the relationship between artificial intelligence usage and critical thinking skills in a natural setting without manipulation or control (Mustieles et al., 2020). To conduct the study, the researchers first sought approval from the dean of the institution through a formal letter, after which orientation was provided to both the instructors and the selected students to explain the purpose of the research and the proper procedure for answering the questionnaires. The survey instruments were then administered to the randomly selected second-year BSED-English students, who were encouraged to answer honestly and accurately, and the completed forms were retrieved immediately after completion to ensure data integrity. All responses were carefully checked, collated, and tabulated before statistical analysis. The mean was computed to describe the level of artificial intelligence usage and critical thinking skills among the respondents, while Pearson's r was employed to determine the significance of the relationship between the two variables. This systematic conduct of the study ensured methodological rigor and provided reliable data for interpretation in line with the research objectives.

IV. RESULTS AND DISCUSSION

The summary of means for the three key indicators of artificial intelligence usage, functionality, availability, and complexity, is shown in Table 1. The overall mean extent of AI usage is 3.95, indicating that students have a regular extent of AI usage and frequent application of AI tools. Among the indicators, availability has the highest mean (4.01), suggesting that students frequently use AI tools due to their easy accessibility. In contrast, functionality has the lowest mean (3.92), implying that while students use AI to streamline academic tasks, they may perceive some limitations in its effectiveness. Complexity (3.95) falls between the two, indicating that students engage with AI for academic purposes but may encounter challenges with its more advanced features. These findings highlight AI's growing role in students' academic routines. While its accessibility encourages frequent usage, the lower rating for functionality suggests that students may not always find AI effective for certain academic tasks. Additionally, the moderate score for complexity indicates that some students may struggle to navigate AI's advanced features, potentially limiting its full educational benefits. This suggests a need for

further guidance and structured support to help students effectively navigate and utilize AI tools, ensuring they can fully benefit from their educational potential.

Table 1 Artificial Intelligence Usage

Indicators	AWM	Descriptive Equivalent
Functionality	3.92	Agree
Availability	4.01	Agree
Complexity	3.95	Agree
Overall Mean	3.95	Agree

These results align with the study of Chen, Chen, and Lin (2020), which found that AI provides automated feedback and personalized assistance, enhancing students' learning experiences through systematic support. Similarly, Zhou, Zhang, and Chan (2024) highlighted that while students recognize AI's usefulness, they often struggle with its complex features, leading to varied engagement levels. The findings of the current study support these perspectives, reinforcing that while AI is widely embraced, greater guidance is needed to navigate its advanced functionalities. The level of critical thinking skills is presented in Table 2. It had an overall mean of 3.96, indicating that students frequently apply critical thinking skills in their academic tasks and daily activities.

Table 2 Critical Thinking Skills

Indicators	AWM	Descriptive Equivalent
Remembering	4.02	Agree
Understanding	3.76	Agree
Applying	4.13	Agree
Analyzing	3.86	Agree
Evaluating	4.13	Agree
Creating	3.97	Agree
Overall Mean	3.96	Agree

Among the six indicators, applying and evaluating received the highest mean of 4.13, while understanding had the lowest mean of 3.76. This suggests that students are more confident in applying and evaluating information but may find understanding concepts slightly more challenging.

The findings suggest that students demonstrate a significant level of critical thinking skills, as shown by their frequent use of these skills in academic and daily tasks. Their strength in applying and evaluating information reflects confidence in tasks that require judgment and practical use of knowledge. This reflects a readiness to engage with complex tasks that require critical analysis, problem-solving, and thoughtful decision-making across different contexts. However, the lower score in understanding indicates a need for enhanced instructional support and more targeted learning strategies to help students fully grasp, interpret, and internalize key concepts. This finding aligns with the studies of Kobylarek et al. (2022), who emphasized that critical thinking involves multiple cognitive processes that enhance students' ability to solve problems and make informed decisions. Similarly, Prakong (2024) highlighted that students who engage in critical thinking demonstrate higher levels of academic achievement and adaptability in learning. The research further supports the idea that fostering a learning environment that promotes questioning, analysis, and

creativity enhances students' critical thinking abilities. Although students show a high level of applying and evaluating, there is still a need to strengthen their level of understanding, ensuring a well-rounded approach to cognitive development.

The correlation between Artificial Intelligence Usage (AIU) and Critical Thinking Skills (CTS) among second-year BSED-English students is displayed in Table 3. The computed correlation coefficient (R) is 0.601, which indicates a moderate positive correlation between artificial intelligence usage and critical thinking skills. This suggests that as students' usage of AI increases, their critical thinking skills also tend to improve.

Table 3 The Relationship Between Artificial Intelligence Usage and Critical Thinking Skills

Variables	AWM	N	R	p - value	Decision	Remark
AIU	3.95	89	0.601	0.0	Reject	

The significance level is assessed using the p-value of 0.000, which is less than the standard threshold of 0.05. Since the probability value falls below this threshold, the null hypothesis (Ho) is rejected. This means there is a statistically significant relationship between AI usage and critical thinking skills, supporting the assumption that AI usage plays a role in students' cognitive development. The results highlight that AI tools frequently support various cognitive processes, including remembering, understanding, applying, analyzing, evaluating, and creating. The moderate correlation value suggests that while AI usage is associated with critical thinking development, other factors may also contribute. Further research could explore these influences to provide a more comprehensive understanding of critical thinking development in AI-assisted learning environments. This finding is further supported by Essien, Bukoye, O'Dea, and Kremantzis (2024), who found that AI text generators like ChatGPT enhance students' critical thinking by developing skills such as understanding, application, analysis, and evaluation through personalized and student-centered learning. They emphasized that when AI is thoughtfully integrated with traditional methods, it effectively supports both foundational and higher-order thinking, which helps explain the moderate positive correlation observed in the present study. Similarly, a case study by Vasconcelos and dos Santos (2023) showed that ChatGPT and Bing Chat served as "agents-to-think-with" during STEM learning tasks. These AI tools prompted students to reflect on their assumptions, analyze problems more deeply, and explore multiple solution strategies, further supporting the present study's finding that AI usage is moderately linked to the development of critical thinking skills. These findings suggest that AI should be used as a supplementary tool in education to foster higher-order thinking. Zhai, Wibowo, and Li (2024) warned that over-reliance on AI may weaken independent reasoning skills. Educators should balance AI integration with inquiry-based learning, guided discussions, and problem-solving tasks to maximize its benefits while ensuring that students continue to develop and strengthen their critical thinking abilities.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed to address the areas where students showed the least strength in both AI usage and critical thinking skills. To enhance AI functionality in student learning, educators should encourage students to use AI proactively rather than only when they receive low grades. Teachers can integrate AI-driven formative assessments that provide instant feedback, helping students improve continuously. Additionally, AI customization training should be included in digital literacy lessons to teach students how to tailor AI settings to their academic needs. Educators must also emphasize that AI is a tool for learning rather than a fallback for academic difficulties. Academic institutions and administrators should improve AI accessibility by ensuring students can use AI tools anytime. Schools can provide AI-integrated learning platforms with offline features or partner with educational AI providers for free access. Administrators should also develop AI literacy programs that teach students responsible usage, focusing on its role in strengthening cognitive skills rather than replacing independent learning. Training for teachers should emphasize AI's potential to enhance lesson delivery while maintaining academic integrity. Students and parents should actively participate in responsible AI usage.

Schools should organize workshops to train students in generating examples, understanding complex texts, and organizing ideas using AI tools. Teachers can incorporate AI-assisted flashcards, quizzes, and self-testing to improve retention.

At home, parents can support learning by encouraging discussions around AI-generated content, helping students express and refine their thoughts. Clear AI usage guidelines and structured class discussions where students justify their viewpoints can also strengthen analytical thinking.

Lastly, future researchers should explore which specific AI features most effectively support students' ability to understand, analyze, and create across various learning contexts. Since the study found that AI's role in fostering higher-order thinking skills remain limited, future studies should investigate how particular AI tools can enhance students' capacity to comprehend complex texts, identify relationships between concepts, and revise or restructure written content with clarity. Additionally, expanding research through qualitative insights, such as student interviews or focus groups, will offer a deeper understanding of their learning challenges and inform more effective strategies for optimizing AI as an educational tool.

V. CONCLUSION

The study revealed that students demonstrated a regular extent of artificial intelligence (AI) usage, as reflected in their frequent use of AI tools to support academic tasks. Availability was the most applied aspect, as students found AI tools easily accessible. However, functionality was the least utilized, suggesting that while students relied on AI for basic

academic tasks, they may not have fully explored its features to enhance performance. In terms of critical thinking skills, the students also exhibited frequent application, showing confidence in applying and evaluating information in academic contexts. On the other hand, understanding was the least demonstrated, indicating that some students may have difficulty fully comprehending certain concepts. Moreover, the findings showed that artificial intelligence usage has a moderate positive correlation with critical thinking skills, indicating that students who engage more with AI tend to develop stronger cognitive abilities. The correlation analysis further suggests that while AI usage plays a role in enhancing critical thinking, other factors may also contribute to its development. This emphasizes the need for a balanced approach when integrating AI into learning. Therefore, promoting meaningful and guided use of AI can support the development of essential cognitive skills, helping students approach academic tasks with deeper analysis, evaluation, and creativity. The results of this study support the Cognitive Development Theory by Jean Piaget (1994), which states that cognitive growth is driven by learners' active engagement with their environment. The students' use of AI tools allowed them to interact with digital resources, promoting deeper thinking and problem-solving. Additionally, the study aligns with the proposition of Melisa et al. (2025) that the structured and guided use of AI tools such as ChatGPT encourages students to access, assess, and apply information, fostering critical thinking and independent judgment. Hence, the theoretical framework of the study was validated, confirming that AI tools can function as cognitive enhancers in an educational setting. These results offer valuable insights into the role of AI in education, particularly in developing students' critical thinking skills. The study supports previous literature suggesting that AI has the potential to enhance cognitive development when used effectively (Wu, 2024; Gerlich, 2025; Mickunas & Pilotta, 2023). However, since limitations were observed in fostering deeper thinking, particularly in understanding, future research should explore ways to optimize AI tools for enhancing comprehension and higher-order thinking skills.

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