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Assessment Redefined: Educational Assessment Meets AI - ChatGPT Challenges

Kleopatra Nikolopoulou[1]

1. Department of Early Childhood Education, National and Kapodistrian University of Athens, Athens, Greece.
E-mail: klnikolop@ecd.uoa.gr

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ABSTRACT

Generative artificial intelligence (AI) becomes continually integrated in educational environments and, particularly, in higher education. The advanced and growing capabilities of AI tools like ChatGPT for educational assessment (e.g., text generation, problem-solving, assisting with essays and grading, personalized feedback, real-time evaluations) challenge traditional assessments. The purpose of this conceptual paper is to discuss alternative assessment practices-approaches that face the challenges posed by AI tools (like ChatGPT). Such approaches include oral exams, presentations, project-based, real-world, real-time in-class assessments, skills-based, collaborative problem-solving, and ethical assessments (these may reduce the risks of over-reliance on AI). Examples of alternative assessment approaches using ChatGPT as a supportive tool in specific subjects (language & literature, sciences, mathematics, history & social sciences, computer science & engineering, business & economics) are presented. AI tools might be considered as supplementary to assist/support assessments rather than as a replacement for educators. When redefining educational assessment, ethical considerations and academic integrity need to be addressed.

KEYWORDS

Generative artificial intelligence; assessment; ChatGPT; higher education.

Introduction

The rise of generative artificial intelligence (henceforth AI) in education is associated with opportunities and challenges in various areas including assessment. Assessment is a crucial educational process-practice because it aims to guide and enhance students' learning. Capabilities of AI tools like ChatGPT for assessment include text generation, problem-solving, assisting with essays and grading, personalized feedback, real-time evaluations, and interactive dialogue-based assessments. AI-powered systems can generate personalized assessment tasks, adaptive assessments that adjust difficulty based on students' responses (Zawacki-Richter et al., 2019), enhance assessment authenticity (Williams, 2025), provide instant feedback to students (Mao et al., 2024), and assist with the automated grading of assignments/tests (Bower et al., 2024; Nikolopoulou, 2024a). The data-processing capabilities and adaptability of AI can augment the assessment process, allowing for more nuanced, real-time feedback, enabling students to be active participants in their learning (Chan & Colloton, 2024). For example, ChatGPT can automate and assist the grading/marking of written tests and exams, providing quick-immediate feedback to students (Kolade et al., 2024; Kooli & Yusuf, 2024; Li et al., 2024; Newton & Xiromeriti, 2024), and freeing up tutors to focus on more in-depth and personalized feedback/assessments. In turn, AI-generated feedback and automated assessment may facilitate students' self-regulated learning and motivation (Nikolopoulou, 2023).

AI's and ChatGPT's advanced and growing capabilities challenge traditional assessments by enabling students to quickly generate high-quality responses to conventional tasks like essays or problem-solving, thus diminishing the reliability of such tasks. AI tools easily handle fact-based questions (Gamage et al., 2023; Susnjak & McIntosh, 2024), while traditional assessments such as essays and multiple-choice questions are vulnerable to AI misuse (Evangelista, 2025; Newton & Xiromeriti, 2024). Since predictable questions allow AI to generate correct answers, the ease of cheating constitutes a challenge (Evangelista, 2025; Moorhouse et al., 2023; Richards et al., 2024; Roberts, 2025). Traditional, conventional assessments may be inadequate because they often rely on static questions (e.g., factual recall or basic comprehension tasks) that tools like ChatGPT can easily answer. They often fail to assess skills like critical thinking, creativity, or problem-solving (skills that AI cannot easily replicate), making them inadequate in an AI era.

Due to the challenges posed by AI, educational assessment needs to be redefined and adapted to make it difficult for AI to replicate. Academic integrity and plagiarism are actual concerns for higher education institutions, but AI may provide a means to refocus assessment that evaluates higher-order cognitive abilities (Williams, 2025); integrating AI will allow a more authentic approach to assessment. Alternative approaches/formats of assessment (e.g. oral exams, real-time, or project-based assessments) can reduce student cheating, focus on higher-order cognitive skills, and (may) ensure academic integrity. Alternative, enhanced assessment practices should be discussed/applied by considering ethical issues and concerns in maintaining academic integrity (e.g., plagiarism and originality concerns, automation of tasks like problem-solving, or essay writing). The purpose of this conceptual paper is to discuss alternative assessment practices that face/meet (AI) ChatGPT's challenges in educational assessment.

The structure of the paper is as follows. Next section discusses empirical findings regarding AI tools like ChatGPT in educational assessment. Then, alternative assessment approaches-practices in the era of AI are discussed, followed by presentation of subject-specific examples for alternative assessment approaches. Finally, basic ethical considerations and the conclusion are presented.

Generative AI tools like ChatGPT into educational assessments: Recent empirical research

A systematic review (Crompton & Burke, 2023) revealed that AI was used for assessment-evaluation, while automated assessment (marking of questions, grading thesis statements, essay grading, etc.) was the most common. Another review (Memarian & Doleck, 2024) stressed the role of feedback in learning with AI, and suggested, feedback that focuses on learning rather than on marks, collaboration among students with a smart AI tutor/mentor, and feedback linked to the purpose of the assignment.

Almegren et al. (2024) explored how AI tools compare with humans in evaluating the essays written by students in a writing course, and indicated that such tools provide high-quality feedback to students. AI-assisted feedback influences self-regulated learning processes and grammatical accuracy among English as a Foreign Language (EFL) learners (Yener & Selçuk, 2024). Similarly, Li et al. (2024) utilised ChatGPT in marking written assignments against a pre-defined criteria sheet, and it was found that it generated textual justifications based on the rubric and the assessment task description when prompted. Since outcomes generated by different prompts differed, the role of effective prompts was highlighted.

Research studies explored generative AI vs. human assessment (e.g., Kooli & Yusuf, 2024; Usher, 2025). Kooli & Yusuf (2024) compared the grading performance of ChatGPT with that of human correctors and indicated a moderate correlation between the grades assigned by ChatGPT and human correctors. The researchers stressed potential risks such as the exacerbation of educational inequalities and the limitations associated with AI's automated nature (e.g., the automated nature of ChatGPT's grading may fail to capture the context-specific insights that humans can provide). Usher (2025) compared the grades and feedback provided by AI chatbots, peers, and the course tutor for student projects in higher education context. Students were engaged in a group project (the phases of peer assessment and chatbot-based assessment were included) and the importance of human judgment was stressed (integration of chatbot-based assessments with traditional methods can leverage their complementary strengths to enrich student learning).

When ChatGPT was used as a tool for grading student programming tasks, both advantages (e.g., time efficiency, unbiased grading, enforcement of coding standards, feedback generation) and limitations (e.g., potential hallucinations, lack of absolute agreement reproducible results, need for educator's intervention) were reported (Jukiewicz, 2024).

Lately, ChatGPT was indicated as a more effective assessment tool when used for critical evaluation tasks, aligning with pedagogical emphasis on exercising critical evaluation skills (Oates & Johnson, 2025); this AI tool was used in essay writing, and the researchers suggested it should not be considered as substitute for human academic enquiries.

In parallel, a small number of studies report on teachers' and students' perceptions/experiences on the role of AI in assessment.

Bower et al. (2024) indicated that K-12 to university level teachers believe in the role of AI on teaching and assessment, they realize the challenges posed by AI, and make suggestions about different ways to better assess students (e.g., spoken tasks, face-to-face assessments); factors such as teaching level/experience, discipline and gender influence teachers' perceived impact of AI. Corbin et al. (2025) investigated university students' and educators' concerns, experiences, and expectations regarding generative AI in assessment: Many students stress the need for clear institutional guidance about acceptable AI use in their assessments, while educators report emotional burden and professional uncertainty as they attempt to understand and communicate what is appropriate to their students. Tutors and university students express skepticism towards AI-only marking, but greater acceptance when combined with tutor feedback (Roe et al., 2024).

The latest empirical findings reveal the role of generative AI tools like ChatGPT as a marking supplement and assistant to human markers (rather than a replacement for the teachers), as well as the need for clear guidelines-policy.

Alternative assessment approaches-practices in the era of AI

The capabilities and recent empirical findings lead us to rethink educational assessment. This means a shift from knowledge recall to skills development, emphasizing critical thinking, creativity, and ethical AI use (Evangelista, 2025; Hodges & Kirschner, 2024). A greater focus on process rather than product (e.g., assessing learning process, not just outcomes), and also incorporating AI literacy (educating students on responsible AI use and critical evaluation of AI outputs). Alternative assessment approaches can facilitate educators move beyond traditional multiple-choice tests and essays, making it more difficult for AI tools like ChatGPT to interfere with the assessment process. Such approaches not only reduce the risks of over-reliance on AI, but also encourage creativity, critical thinking, and student engagement. It is noted that in some approaches AI can be integrated as a supportive-complementary tool to refine, or strengthen the process. Examples of such practices/approaches include:

Oral Exams or Presentations

These formats assess students' ability to communicate complex ideas and respond to questions, making it difficult for AI tools to intervene (preventing over-reliance on AI). Oral examinations and presentations enable live question-answer sessions where students explain their understanding or defend their work, ideas, or findings. Students are able to speak on the topic and defend their position/arguments, thus learning has been demonstrated (Kumar et al., 2024). Bower et al. (2024) suggest spoken tasks and face-to-face assessments as different ways to better assess students. ChatGPT could be used as part of the assessment by having students engage with the AI and reflect on or critique its responses.

Project-based assessments

Students can work on extended projects that involve research, design, development, and presentation. This format allows for a more comprehensive evaluation of their skills, knowledge, and

critical thinking competencies. ChatGPT could be used within creative (AI) projects to co-create something (e.g., a short story/essay, a lesson plan) and evaluate/explain the output's originality, and context; that is, students will be asked to reframe, improve, or revise ChatGPT's output to suit specific audiences or contexts. Currently, there is little research regarding AI and human assessment of short essays/stories (e.g., Almegren et al., 2024). Students could be assessed on their ability to integrate AI into cross-disciplinary projects such as combining programming with ethics.

Real-World assessments

Educators can design assessments that reflect real-world scenarios, requiring students to apply what they have learned to solve complex, open-ended problems; i.e., problem-based learning enhanced by AI. When students apply their understanding in real-life situations/scenarios, they cultivate skills that are beyond the capabilities of AI tools to reproduce. Real-world problem solving is an essential aspect of authentic assessment in the AI era (Chan & Colloton, 2024). This approach emphasizes critical thinking, creativity, problem-solving, and decision-making skills, making it harder for AI tools to replicate. For example, students could be asked to respond to real-world scenarios, such as emergency environmental crises, or business case studies. In the process of solving real-world, open-ended problems, students will be asked to use ChatGPT as a supportive tool and properly document AI's role (student justification can be assessed).

Real-Time, in-class assessments

Such assessments require students to work on problems or tasks in real-time, without the opportunity to seek outside assistance. This format assesses their understanding, application, and critical thinking skills in a controlled environment; it can suitable for formative type of assessment. Real time assessment and feedback focused on learning is important (Chan & Colloton, 2024; Mao et al., 2024; Memarian & Doleck, 2024).

Skills-based assessments

Such formats focus on assessing specific skills, competencies, or knowledge, rather than general knowledge. This approach can help identify students' strengths and weaknesses, providing a clearer picture of their abilities. Assessment that focuses on higher order cognitive skills has been highlighted by researchers (Evangelista, 2025; Hodges & Kirschner, 2024; Williams, 2025). For example, critical thinking and evaluation tasks require students to critique AI-generated content for accuracy, bias, and quality, assessing their analytical skills. Prompt writing tasks assess students' ability to create effective AI prompts, refine prompts and, then, critically interpret AI output-responses. Documenting learning process tasks, include how students use tools like ChatGPT, their thought processes, and decisions made throughout the process.

Collaborative problem-solving assessments

This format enables assessment of students' ability to work in groups to solve complex problems or complete tasks; thus, communication, collaboration, and problem-solving skills can be evaluated/assessed. The role of collaboration among students in AI-enabled educational environments has been reported by Memarian & Doleck (2024). Students should be encouraged to collaborate on group projects where they use ChatGPT for obtaining initial ideas, research, or

drafting, while in parallel, emphasize teamwork, originality, and critical thinking in final products/assignments.

Peer review and self-assessment

Peer review and self-assessment approaches enable students to evaluate each other's work and reflect on their own learning (including how effectively AI tools like ChatGPT were implemented). Peer assessment encourages active learning, while students can gain a deeper understanding of the topic/subject and learning objectives. By assessing the work of their peers, students often engage in self-reflection and self-assessment. In this format, critical thinking, collaboration, and metacognitive skills can be fostered. A recent study (Usher, 2025) highlights the importance of human judgment; peer feedback was more personalized and context-sensitive, while AI chatbots provided detailed insights-guidance and occasionally included irrelevant information requiring student intervention. Kooli and Yusuf (2024) also report that ChatGPT's grading may fail to capture the context-specific insights that humans can provide.

Ethical and Reflective assessments

By writing ethics essays, students could explore ethical dilemmas related to AI in education, including its use in their own learning process. Reflective essays could be useful, when asking students to discuss how AI tools like ChatGPT influenced their learning and problem-solving approaches. Ethical awareness and AI use have been voiced in several studies (e.g., Evangelista, 2025; Hodges & Kirschner, 2024; Nikolopoulou, 2024a).

Reflective journals or learning portfolios

Students could be asked to keep/maintain reflective journals or learning portfolios throughout an academic course/module. For example, to present a portfolio of their artwork, discussing their artistic process, influences, and the process of developing their work. This approach assesses their metacognitive skills, self-awareness, and ability to reflect on their learning process. Portfolio assessment in AI-assisted environments has the potential to foster personalized learning and positive attitudes towards the subject studied (Khasawneh et al., 2025).

Subject-specific examples for alternative assessment approaches

Alternative assessment approaches can be implemented in specific subjects. Students studying computer science, engineering, or related fields are more likely to have a deeper understanding of AI capabilities compared to students in non-technical fields, because AI is often a core part of the curriculum in technical programs. However, it is essential to consider various disciplines because each field has unique learning objectives, skills, and knowledge areas that require tailored assessment methods. Below are some subject-specific examples, using ChatGPT as a tool.

Language and Literature

Students can use ChatGPT for inspiration (e.g., generating initial/character ideas) and creative writing. However, they must then produce their own story, and explain how they incorporated or rejected AI suggestions. ChatGPT can be utilized to brainstorm ideas for a short story or essay and document student thought process (including revisions and justifications for changes). Critical thinking tasks could be included: e.g., assign students to critique a poem or literary analysis generated

by ChatGPT, focusing on identifying bias, mistakes, or missed themes. AI-enabled assessment can be useful in language education with a proper implementation design, to benefit students' personalized language learning (Chen et al., 2025).

Sciences

Research projects are particularly useful for this subject. That is, to assign real-world challenges (e.g., How can we recycle in our institution?) where students use ChatGPT to find relevant research and synthesize findings into actionable solutions. In science education, ChatGPT student-users reported enhanced perspectives, efficient comparisons, and clearer articulation, underscoring AI's potential to foster innovative research practices (Anik et al., 2025). Students could engage in a 'dialogue' with ChatGPT about complex scientific concepts (e.g., climate change) and evaluate their ability to correct, and refine AI-generated explanations. ChatGPT can also be used to draft sections of a lab/experiment report, but they must critically evaluate and justify any changes they make. Using ChatGPT as a 'virtual peer' in peer assessment activities has the potential to enhance Science, Technology, Engineering, and Mathematics (STEM) education competencies and facilitate knowledge construction (Wu et al., 2025).

Mathematics

Problem solving with reflection is an assessment practice where students solve advanced problems with ChatGPT's help and then explain their thought process, identifying where AI provided insights or made mistakes. In a recent study (Biton & Segal, 2025), mathematics students were given an assignment to pose and refine additional problems by giving prompts to the AI environment and refining them; ChatGPT's responses and students' reactions to these contributed towards improving mathematical problems (e.g., enhancing the clarity of the problem by increasing its complexity, improving mathematical precision and possible link to real-world applications). In mathematical proofs, students could assess ChatGPT-generated proofs for errors, gaps in logic, or misinterpretation of concepts. Students could be asked to design a real-world statistical model using AI to generate raw data, while focusing on their interpretation and analysis.

History and Social Sciences (e.g., psychology, education)

Students can use ChatGPT to generate summaries of historical documents (primary sources); they will be assessed on their ability to verify, critique, and contextualize the summaries, identifying inaccuracies or oversimplifications. ChatGPT could be harnessed to generate survey questions for social sciences/experiments, and then evaluate and refine the questions to avoid bias or inaccuracies. In social sciences, students could write reflective essays on how ChatGPT interprets human behavior or societal issues, discussing biases and assumptions in AI outputs. When social studies students generate lesson plans via ChatGPT, it is necessary to then analyze and critically evaluate the output (Kalenda et al., 2025). Similarly, student teachers can initially use ChatGPT to create ideas or lessons plans for specific age-groups and topics (Nikolopoulou, 2024b), and then they must assess AI's outcome and its alignment with current pedagogical principles/strategies.

Computer Science and Engineering

Students can design and test ChatGPT prompts (prompt engineering) for specific tasks such as debugging code, and document how prompt phrasing affects outcomes. They can also be assigned

to collaborate with ChatGPT to develop small programs, requiring them to explain why they chose specific algorithms or debug errors (within AI's code suggestions). ChatGPT can be used as an assistive tool for student programming tasks (Jukiewicz, 2024). Students can be asked to co-design a bridge or create engineering scenarios with ChatGPT's aid, focusing on their ability to evaluate and modify AI-generated content/ideas. It is important that students critique technical documents or code written by ChatGPT for clarity, functionality, and correctness.

Business and Economics

Case studies are useful in that students can develop business strategies for startups, using AI for market research; assessment will regard their analysis and decision-making. ChatGPT can draft simple financial models (which will then be refined, and explained by the students) or create/develop economic policies such as addressing inflation; the output, and any AI-generated policies will then be evaluated and criticized by the students. A recent study in business education context indicated that ChatGPT enables students to engage more deeply with complex scenarios, thus enhancing their analytical and evaluative skills (Essien et al., 2024); critical thinking skills are essential in AI-powered educational environments.

Arts and Design

Creative portfolios enable students to co-create digital art or design concepts using ChatGPT for inspiration (e.g., generating descriptions or themes for artwork); they will then explain how they integrated AI ideas. Students could be asked to critique a design generated by ChatGPT, focusing on elements like aesthetics, usability, or cultural relevance. Finally, role-playing or simulation tasks provide the possibility for students to act as art curators, using ChatGPT to assist in creating descriptions (e.g., for an imaginary gallery exhibit) and then justify their choices. The application of artificial intelligence based digital media technology in art teaching simulation, may enhance the interactivity, personalization, and effectiveness of art teaching (Liao & Cao, 2025).

Ethics and Philosophy

A new assessment practice is to engage students in live debates on AI ethics, using ChatGPT to generate counterarguments that they must analyze and respond to critically. Students could conduct a simulated philosophical dialogue with ChatGPT, analyzing its reasoning and biases (dialogue-based assessment). They can also evaluate how ChatGPT interprets ethical dilemmas. In order to apply AI positively in the future, a broader and more holistic assessment of the technology is vital, involving not only scientific/technical perspectives, but also those from the humanities (Segessenmann et al., 2025).

The above-mentioned examples in specific subjects may encourage skills like higher-order thinking, critical evaluation, and creative application of AI tools; also, ensuring students remain active participants in the learning process. Responsible use of AI tools (students must employ ethical decision-making) will assist educators and students in applying critical thinking when integrating educational tools into the assessment process (Griffin & James, 2025). In today's complex, interconnected world, many real-world problems require interdisciplinary solutions. By incorporating alternative assessments from various disciplines, educators can encourage collaboration, critical thinking, and creativity across disciplinary boundaries. Also, by sharing assessment-related

experiences, educators can learn from each other. When assessments are designed, clear expectations for AI use within student learning activities need to be applied. AI tools can be embedded in different disciplines and curricula, while clear policies should ensure fairness in AI/ChatGPT use, academic integrity and inclusive education.

Ethical considerations

When discussing alternative assessment practices-approaches in educational context, ethical considerations and concerns should also be addressed. These considerations include academic integrity (e.g., challenges of using AI reliably in assessment, detecting AI-generated work), algorithmic bias and accessibility (ensuring AI tools are inclusive), data privacy concerns (e.g., managing data generated through AI assessments), and over-reliance on technology. For instance, when ChatGPT is used for assignment writing, it is basic to use it in association with student critical analysis, avoid over-reliance on the tool, avoid plagiarism and ensure the accuracy-relevance of the information included in the writing. Ethical challenges including low technological readiness, lack of transparency, inadequate privacy (Yan et al., 2024), and concerns associated with academic integrity, cheating and plagiarism, as well as AI's potential misuse have been reported (Crawford et al., 2023; Moorhouse et al., 2023). Cao et al. (2023) reported that ChatGPT exhibits a strong alignment with American culture, while it adapts less effectively to other cultural environments. Encouraging ethical usage of generative AI in order to reduce possible negative aspects and promote academic integrity, has been stressed in recent studies (Evangelista, 2025; Francis et al., 2025; Nguyen, 2025).

Ethical use of generative AI-assisted assessment practice is associated with provision of appropriate and clear guidelines, and implications for educational policy. Educational policy will play a crucial role in eliminating AI-generated risks, avoiding biases, while ensuring transparency, fairness, equity, inclusivity, data and privacy protection. Policy and implementation guidelines include updating academic honesty policies for AI use, ensuring that assessments meet standards while using AI tools, and providing student and teacher training (e.g., in order to incorporate AI in teaching and assessment). It is a challenge for educators to distinguish students' own effort from AI-generated output. Educational institutions must ensure that AI complements traditional learning (e.g., important to balance human expertise and AI capabilities), maintain academic integrity, and prioritize ethical AI use (Francis et al., 2025; Nguyen, 2025). Student (and teacher) training programs can contribute towards responsible use and integration of AI-enabled tools. Indicatively, appropriate training will empower students and educators to understand the functionalities of the new AI tools, develop AI literacy skills (including critical thinking, problem solving, and communication skills), interpret the generated responses, harness AI's affordances, and ensure ethical usage. Educational institutions should respond to AI technology changes, by adopting policies that facilitate the maintenance of students' academic integrity and protect their privacy and safety (Nikolopoulou, 2024b). Ensuring ethical standards aligns with sustainable AI use (Nikolopoulou, 2025).

Conclusion

Generative AI tools like ChatGPT provide innovative possibilities for educational assessments. They can enhance assessment by automating grading, providing personalized feedback, and generating adaptive questions based on student performance. They analyze patterns to identify learning gaps, support self-assessment through interactive dialogue, and simulate real-world scenarios for practical evaluation. These tools enable scalable, and data-driven assessments, often aligning assessments with individual student needs. AI can enhance both summative assessment and formative types of assessment (not mutually exclusive types); it enhances summative assessment (students' evaluation takes place at the end of the learning cycle) by automating essay grading, and analyzing student responses; it personalizes formative assessment (students receive feedback throughout the learning process, in order to improve their performance/understanding) through adaptive feedback, generating tailored questions, and identifying learning gaps in real-time. As new capabilities challenge traditional assessments, this paper presents alternative assessment practices-approaches that face the challenges posed by AI tools (like ChatGPT). Such approaches include oral exams, presentations, project-based, real-world, real-time in-class assessments, skills-based, collaborative problem-solving, and ethical assessments. Different approaches, using ChatGPT as a tool, can be applied in specific subjects such as language & literature, sciences, mathematics, history & social sciences, computer science & engineering, business & economics. Due to the above, educators, policymakers, and researchers will need to rethink, and possibly redesign, assessments in the light/era of AI.

The adoption of AI tools in assessment is in its early stages, several studies are theoretical, and research is needed on the topic. When integrating AI/ChatGPT into educational assessments, potential benefits (e.g., enhancement of personalization, provision of immediate feedback for real-time data analysis) as well as potential risks (e.g., educational inequalities, academic integrity) should be considered (Francis et al., 2025; Mao et al., 2024). Higher education institutions may embrace AI-powered tools within the assessment process (Moorhouse et al., 2023). However, AI tools might be considered as supplementary ones to assist/support the grading process, providing additional time, moderating and refining individual feedback (Li et al., 2024). AI's role in educational assessment is suggested to be supportive and complementary, rather than a replacement for the teachers. The design and the educational objectives of written assessments should be carefully considered by educators.

Since educational assessment is changing due to AI's evolving capabilities, future research is suggested to explore, for example, how AI-assisted assessments influence student learning and engagement, or differences in assessing students in various disciplines.

Conflicts of Interest

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