SOCIAL INNOVATIONS Journal
Vol. 30 (2025): The Future of AI in Education: Innovations and Insights

Rubric Generation in Colleague AI: Transforming Assessment in Education

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Keywords: AI in education, standards-based learning, rubric generation, assessment

Abstract

The Colleague AI platform introduces a groundbreaking Rubric Generation function designed to streamline how educators create and use rubrics for instructional and assessment purposes. This feature uses artificial intelligence (AI) to produce standards-based rubrics tailored to course content for formative and summative evaluations. By automating this traditionally time-intensive process, Colleague AI empowers educators to focus on enhancing learning outcomes, personalizing content, and ensuring clarity in expectations for students. This article explores the functionality, implementation, and potential of the Rubric Generation function. We also discuss challenges in implementation and offer future directions for its scaling and impact.

Introduction

Classroom assessment is one of the cornerstones of effective teaching and learning, serving as a rich source of information regarding student performance and a guide for instructional decisions. Traditional assessment practices are beset with significant challenges related to subjectivity, inconsistency, and misalignment with learning objectives. Such issues can disproportionately affect students because of their demographic characteristics, such as race, gender, socioeconomic status, or religion, and can compromise the validity of inferences educators make about student abilities and achievements (Popham 2011). Designing high-quality rubrics is critical for ensuring fair assessment, but it remains a complex process due to the need for objectivity and alignment with educational standards.

Standards-based grading (SBG) has emerged as one promising method for reforming grading practices by focusing on assessing students' proficiency on a set of well-defined objectives (Iamarino 2014). However, while the major benefits of SBG include increasing student understanding and creating fair assessment, significant challenges are associated with its implementation. For example, educators often struggle to differentiate between academic performance and non-academic factors such as behavior, effort, and attendance (Guskey 2009). Additionally, ensuring consistency in grading across educators and classrooms remains difficult, leading to confusion and undermining the effectiveness of the assessment system.

Our Solution: Colleague AI

Generative AI (GenAI) technology offers real solutions to these persistent challenges in classroom assessment. The Colleague AI platform's Rubric Generation function has the potential to streamline the development of standards-aligned, equitable rubrics. This free, NSF-backed innovative tool supports educators in effectively enacting SBG while mitigating the resource-intensive processes of traditional rubric development. The platform utilizes a form of Retrieval-Augmented Generation (RAG) technology, embedding contextual knowledge from standards and theoretical frameworks, which allows it to maintain consistent alignment with learning objectives. The research-based approaches also separate Colleague AI from other products available in the market.

Colleague AI has a full set of features that can support most K-12 classroom contexts. At its core, the system provides customizable templates that fit seamlessly into established frameworks such as the Common Core State Standards (CCSS) and Next Generation Science Standards (NGSS). To serve diverse learning environments, the platform includes robust multilingual capabilities, ensuring accessibility to a wide range of student populations. The system can also accept multiple input types; this helps educators use different formats like Word documents, PDFs, or even photos of handwriting.

Rubric Generation in Colleague AI

The Rubric Generation function within Colleague AI simplifies rubric creation for teachers. Educators can input details such as grade levels, subject areas, relevant standards, and assessment goals. They can also choose from pre-selected grading scales or directly input their preferred ones. The system generates rubrics aligned with these inputs, ensuring precision and applicability. Teachers can create rubrics just for a particular learning standard, emphasizing SBG and student Learning Progressions (LPs), or they can create rubrics for individual assessment items. Teachers can share the rubrics with students, allowing students to develop metacognitive skills as they reflect on their assignments. Generated rubrics are fully editable, allowing teachers to immediately adapt the AI output to their exact use. Research work is ongoing to develop persistent personalization that remembers teachers' preferences across the platform.

Teachers can provide answer keys to accompany the rubric to aid the LLM in grading student work. They can choose to share the answer keys with students, which is particularly useful in formative assessments, or keep them hidden, which is useful when giving summative assessments. Colleague AI is then able to apply the rubric to returned student work, quickly and accurately grading assignments while providing explanations of how the submitted student work aligned to the rubric.

The platform is designed to keep the teacher fully in control; all AI-generated rubrics are immediately created in an editable format, and no AI-generated grades can be returned to students without teacher review. Once the grades are generated by AI and edited by teachers, the students can then receive the final results with a tag marking "Teacher Verified." The Colleague

AI platform solves challenges around the creation of rubrics, alignment to standards, and progress reporting, ensuring efficiency in assessment practices across diverse learning environments and letting educators focus on what matters: the building of mastery in students.

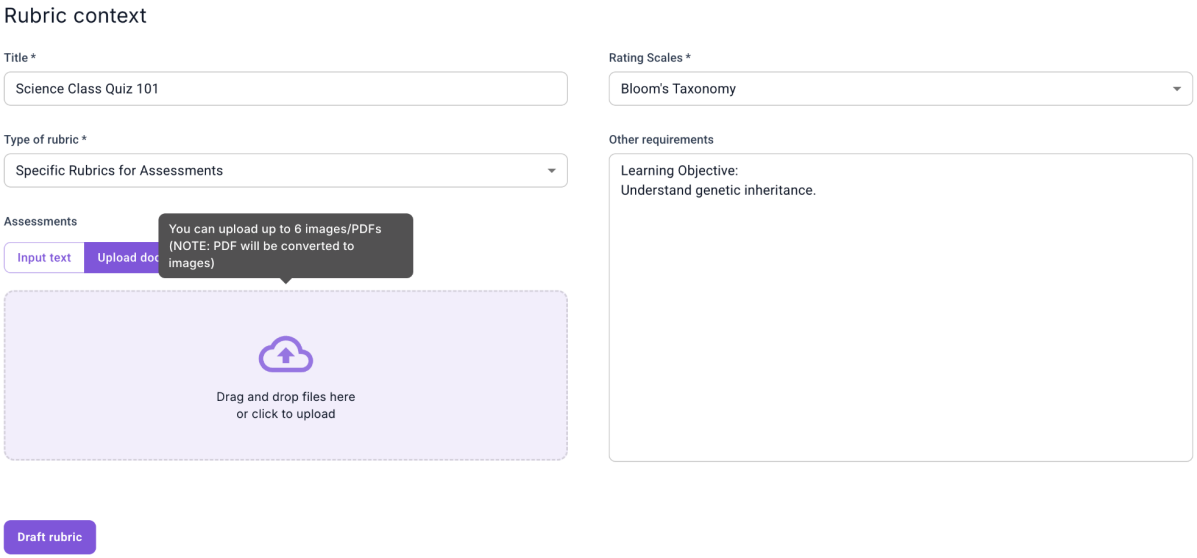

Figure 1. A screenshot of the Rubric Generation function on the Colleague AI platform. Teachers can specify options like types of rubrics, rating scales, learning objectives, etc.

For example, a teacher creating a rubric table for a formative assessment for a high school biology course can:

- Define assessment items or simply upload a class quiz.
- Specify the learning objectives, like “understanding genetic inheritance.”
- Define the rating scale using relevant frameworks like Bloom’s Taxonomy or Depth of Knowledge.
- Receive a comprehensive rubric evaluating content accuracy, understanding of the learning standards, and communication skills.

Key Features

- **Customizable Templates:** Teachers can adjust the generated rubrics with various options to meet specific needs.
- **Standards Alignment:** Supports frameworks like Common Core State Standards (CCSS) and Next Generation Science Standards (NGSS).
- **Retrieval-Augmented Generation (RAG):** Contextual knowledge like CCSS and NGSS documents, as well as other theoretical frameworks, are embedded in the rubric generation function. The AI retrieves relevant information to enhance the generated content.

- **Multilingual Capabilities:** Rubrics can be generated and translated in multiple languages while preserving quality to provide equitable access for multilingual communities.
- **Ease of Use:** Teachers can easily select standards or directly upload course materials (Word documents, PDFs, screenshots with handwritings, etc.) to create a formatted, standard-aligned rubric table.

Beyond Automation

What the platform can do doesn't stop at mere automation. It can also support complex assessment frameworks. For example, the National Research Council's three-dimensional learning framework for K-12 Science Education, which calls for Practices, Crosscutting Concepts, and Disciplinary Core Ideas (National Research Council 2012), is supported on the platform. By applying the AI technology like Colleague AI to the educators' advantage, a deeper probing into students' LPs is feasible, along with the development of comprehensive, holistic rubrics that maintain objectivity and accommodate all forms of students' work (Kaldaras, Yoshida, and Haudek 2022).

The integration of AI technology and educational assessment at this scale creates new possibilities for educators, parents, school leaders, and students to team up in implementation processes for standards-based grading. It ensures coherence in the criteria of evaluation across varied contexts of education while allowing room for flexibility within varied approaches to assessment. Moreover, it allows the educators to report and communicate about student progress within an SBG framework using standardized yet customizable reporting tools that develop clear, meaningful, and actionable assessment summaries (Fernández-Sánchez, Lorenzo-Castiñeiras, and Sánchez-Bello 2025).

Discussion

By automating rubric generation and other routine tasks, AI enables teachers to dedicate more time to personalized instruction and student engagement. It also brings the potential to scale up teaching practices like creating personalized learning paths, providing data-driven insights on student growth, and localizing educational content to fit specific needs. These opportunities made possible by tools like Colleague AI present a transformative opportunity to enhance teaching and assessment practices.

With the Rubric Generation function, teachers can create rubrics for all assessments within a unit in a single step while maintaining alignment with educational standards. With 24/7 availability, AI offers accessibility beyond traditional human coaching, allowing educators to utilize it anytime, anywhere with an internet-connected device. While not a replacement for human coaching and expert-led professional development, this scalability helps provide consistent, locally relevant, and efficient practices across diverse educational systems, bridging gaps in resource availability and addressing disparities in educational access.

Traditionally, classrooms have revolved around two primary agents: the teacher and the students. These two agents interact to create learning experiences, sharing knowledge, and fostering growth. Integrating AI as a third agent adds an entirely new interaction layer, creating a more dynamic and enriched learning environment. AI acts as a support system, connecting teachers and students in innovative ways and bolstering the interactions between teachers and students. By providing actionable insights, scaffolding learning experiences, and offering consistent frameworks for assessment, AI can foster collaboration, creativity, and adaptability.

However, AI tools are not meant to replace teachers in assessing student learning. Educators must remain in control, using AI-generated rubrics as a support tool tailored to their students' unique needs and classroom contexts. Professional development should focus on empowering teachers to effectively use these tools while reinforcing their critical role in guiding and evaluating student learning.

Future directions for Colleague AI's Rubric Generation function include expanding its capabilities to accommodate a broader range of subjects and grade levels. Enhancing its adaptability to local educational contexts and refining algorithms based on user feedback will ensure its continued relevance and effectiveness. Colleague AI will also work closely with schools and school districts to develop specific versions suitable for local contexts, using more aligned materials to fine-tune the AI for better outputs. By fostering collaborations between educators and AI, these tools have the potential to make high-quality, fair assessment practices a standard in classrooms worldwide.

Conclusion

The Rubric Generation function by Colleague AI streamlines the creation of high-quality, standards-aligned rubrics that are uniquely tailored to the individual teachers' lesson plans and classrooms. Automating time-consuming parts of the assessment process enables educators to focus more on meaningful engagement with their students. By fostering accuracy, relevance, consistency, and utility in assessments, this tool not only addresses some of the critical challenges in classroom assessment but also envisions new pathways for innovation and collaboration. As AI tools continue to evolve and adapt to varied educational contexts, they hold the potential to propel forward fair, efficient, and impactful assessment practices in all classrooms.

Acknowledgements

This work is supported by the Institute of Education Sciences of the U.S. Department of Education, through Grant R305C240012 and by several awards from the National Science Foundation (NSF #2043613, 2300291, 2405110) to the University of Washington, and a NSF SBIR/STTR award to Hensun Innovation LLC (#2423365). The opinions expressed are those of the authors and do not represent the views of the funders.

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