AI is Part of the Belonging Ecosystem

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Abstract

In higher education, fostering a sense of belonging is critical to student success, influencing academic performance, retention, and overall well-being. However, creating this sense of belonging can be challenging, especially in online and hybrid learning environments with limited in-person interactions. This paper explores the role of AI course assistants as a scalable, personalized solution to address this challenge. By providing responsive, 24/7 support, AI tools can help bridge the gap between students, instructors, and their peers, enhancing engagement, encouragement, and support. Drawing on data from Los Angeles Pacific University's (LAPU) implementation of Spark, an AI course assistant, we present findings highlighting how AI can play a vital role in supporting students who report lower levels of connection within their courses. Our analysis reveals that students who utilized the AI assistant earned higher GPAs than those who did not, and AI significantly benefited those who initially felt less encouraged, engaged, and supported. These findings suggest that AI course assistants can foster a greater sense of belonging, particularly for students at risk of disengagement.

Keywords: AI course assistants, AI and belonging, belonging, higher education

AI is Part of the Belonging Ecosystem

Belonging is a critical factor in student success, influencing academic performance and overall well-being. In higher education, particularly in online and hybrid learning environments, fostering a sense of belonging can be challenging. However, AI course assistants offer a scalable, personalized solution to bridge this gap and improve student engagement, encouragement, and support. At LAPU, we have implemented AI course assistants for each course and have collected data to show their effectiveness. This analysis highlights critical data points that suggest the need for AI course assistants, particularly among students who report lower feelings of connection within their courses.

Belonging is a foundational component of student success in higher education, influencing not only academic performance but also retention rates, well-being, and long-term engagement (Strayhorn, 2019). Students who feel connected to their institution and their peers are more likely to persist in their studies and achieve academic milestones. However, creating a strong sense of belonging poses a significant challenge in increasingly digital and hybrid learning environments, where in-person interactions are limited. As higher education evolves, the need for innovative solutions to create a more inclusive and connected student experience becomes paramount. AI course assistants are part of this solution.

Several well-established theoretical models provide a foundation for understanding how educational environments can cultivate belonging, particularly when integrating AI tools like Spark, Los Angeles Pacific University's AI course assistant. Three key frameworks are Tinto's Model of Student Retention (1994), Maslow's Hierarchy of Needs (1943), and the Community of Inquiry (CoI) framework.

AI technology can potentially enhance students' sense of belonging by providing personalized, responsive, and scalable support (Woolf, 2013). AI-driven tools, such as chatbots and virtual assistants, are designed to be accessible around the clock, answering questions, offering guidance, and providing timely feedback, which can help students feel supported and connected to their learning community. Particularly in online and hybrid learning environments, where feelings of isolation can be exacerbated, AI assistants can bridge the gap between students and their instructors or peers, reducing the sense of disconnection that is common in such settings (Winkelmes et al., 2016). AI tools are also increasingly capable of strengthening interpersonal relationships through adaptive learning pathways and conversational interfaces, offering tailored resources based on individual student needs (Baker et al., 2008).

Personalization

Spark tailors its responses to individual student queries, providing specific examples and step-by-step guidance. For instance, a student struggling with essay structure can receive a customized explanation on organizing ideas based on their unique writing prompt. This personalized support helps create a responsive learning environment that meets diverse student needs (Hanshaw et al., 2024). In ENGL 101, several students stated their appreciation of using Spark for its 24/7 availability, non-judgmental support, and ability to assist with essay structure and thesis statements, catering to the needs of non-traditional learners (Ho, et al., 2024).

Customization

Faculty can adjust Spark's interaction settings to align with course-specific goals. Instructors can modify prompts, adjust feedback style, and tailor response formats, ensuring Spark complements their pedagogical approach. This adaptability allows Spark to seamlessly integrate into various academic contexts, enhancing instructional design flexibility (Hanshaw et

al., 2024). For example, in ENGL 101, Spark was trained on the syllabus and course content. This empowers students to confidently understand and complete assignments, enhancing their sense of belonging at LAPU (Ho, et al., 2024).

Interpersonal Capabilities

Spark's question-based dialogue system encourages critical thinking by prompting students to explore solutions rather than providing direct answers. Through Socratic questioning, Spark promotes reflection, asking questions like, "What argument are you trying to make?" or "How does this idea support your thesis?" This approach builds problem-solving skills while enhancing student engagement and confidence (Hanshaw et al., 2024).

Faculty Perspectives

Garrison and Vaughan's (2008) Community of Inquiry (CoI) framework highlights that instructors establish teaching presence by designing, facilitating, and guiding learning experiences. Similarly, researchers underscore the pivotal role of instructors in fostering student engagement with AI-powered course assistants. Instructor presence shapes how students perceive and use AI tools integrated into courses.

At Los Angeles Pacific University (LAPU), instructors who framed Spark as a collaborative learning partner observed higher student adoption rates. Faculty modeled specific AI interactions, such as brainstorming and receiving writing feedback, normalizing AI-assisted learning. They also encouraged metacognitive reflection by prompting students to consider how Spark's feedback influenced their understanding and skills, reinforcing the perception of Spark as an essential learning tool.

Transparency about AI's role further promoted engagement. Faculty who explained Spark's capabilities while clarifying that it supplements, not replaces, instructor feedback saw

greater adoption. Embedding guided activities, demonstrations, and real-time examples helped students view Spark as a valuable learning extension, reducing resistance and skepticism.

Despite these efforts, some students hesitated to use Spark due to concerns about AI reliability, a preference for traditional learning methods, or discomfort with technology (Hanshaw, 2024). Faculty addressed these concerns by clarifying Spark's limitations and emphasizing its role as a learning partner. Student testimonials further built trust and increased acceptance.

Survey data from ENGL 101 courses revealed that 75% of students felt Spark clarified coursework and enhanced learning, while 85% in subsequent sections reported an improved understanding of complex concepts. Feedback emphasized Spark's immediate, tailored support, particularly valuable for non-traditional learners managing academic and personal responsibilities.

These findings reinforce the importance of faculty engagement in optimizing AI-powered course assistants. Instructors who communicate clear expectations, model AI use, and integrate the tool into meaningful tasks can significantly enhance student engagement and learning outcomes. By framing Spark as a collaborative partner, faculty can cultivate deeper learning, build student confidence, and strengthen the sense of belonging in online and hybrid learning environments.

Student Perspectives

Student response to Spark has been overwhelmingly positive. One student said, "Thanks for modeling for us how to use Spark. I think Spark is cool. I can ask Spark questions even at 3 AM in the morning. I learned a lot about how to outline a paper from Spark." Another student said, "Spark does not do the work for you. Spark asks me questions on what I already know and

it was like Spark and I did the work together." One last student said, "I used Spark when I did not understand what I was reading. And when Spark explained the difficult concept for me, I finally understood."

Spark has been a great tool in building student morale, and frankly, students love Spark because it is fun to play with. Prof. Ho gave Spark the prompt: "Write an essay about topic X." Spark came back with "What do you know about essay writing?" to prompt the user to keep discussing what they know about essay writing rather than Spark writing the essay for the student. Spark does not write the essay for the student. Instead, Spark encourages students to write the essay themselves because of the probing critical thinking questions it provides at the end of each Spark session. Spark engages students in an active learning process.

Spark also adapts to the English level of the student. If a student speaks at a beginning level of English, Spark adjusts its output to simpler English to reflect what the student can do. Also, a student can prompt, "Explain topic X in Simple English for a beginning ESL student," or "Explain this topic that a 2nd grader would understand," or "Explain topic X for an advanced ESL student." By adjusting to the students' English level, students can better understand difficult concepts in the class, thus enhancing student confidence and belonging in the class (Ho, et al., 2024).

Implementation

The research utilized a quasi-experimental approach due to the absence of a random assignment. Students self-selected into two groups based on their use of Spark:

- **Treatment Group:** Students who actively used Spark during the course
- **Control Group:** Students who did not use Spark

This design allowed for a practical evaluation of Spark's impact within a real-world educational setting, capturing authentic usage patterns.

Data were collected through two primary sources: End-of-course surveys and academic records. The first three questions in the end-of-course survey for LAPU pose three self-report Likert-style questions on the students' feelings of encouragement, engagement, and support within the course. A permutation analysis was conducted to compare the responses of students who used Spark, the AI course assistant, and students who did not use Spark. The three statements the students rated were as follows:

1. I felt encouraged throughout the course.
2. I felt engaged throughout the course.
3. I felt supported throughout the course.

Data analysis involved both descriptive and inferential statistical methods:

- **Descriptive Statistics:** Means and standard deviations were calculated for survey responses and GPAs.
- **Inferential Statistics:**
    - **Permutation analysis:** To compare GPA and survey responses between the two groups
    - **Effect Size (Cohen's d):** To evaluate the magnitude of observed differences

Table 1

Comparison of Means, P-Value, and Cohen's D Effect Size Calculations

Feelings of	Mean Used AI	Mean Did not use AI	p-value	Cohen's D
Encouragement	4.41	4.54	<0.001	-0.15
Engagement	4.39	4.52	<0.001	-0.18
Support	4.43	4.52	<0.001	-0.12

Note. The data measures students' self-reported levels of encouragement, engagement, and support.

The results across all three questions show a lower mean score for those who utilized Spark when compared to those who did not use Spark, as demonstrated in Table 1. This is interesting, but it does not help us answer any questions. When we take a deeper dive into the data, we find that the correlation is not that the use of AI assistants is causing lower feelings of encouragement, engagement, and support. It is the opposite. The AI assistants are being used more by those with lower feelings of engagement, encouragement, and support. The AI assistant is supporting and helping foster a greater sense of belonging for those who do not have that sense.

Our data indicates that students who used the AI course assistant had a significantly higher GPA ($M = 3.32$, $SD = 1.05$) compared to those who did not ($M = 3.04$, $SD = 1.23$), with a mean difference of 0.28 ($p < .001$, Cohen's $d = 0.23$). This difference demonstrates that AI

course assistants may contribute positively to academic performance, likely by providing timely feedback, personalized support, and an enhanced learning experience.

Further analysis revealed positive correlations between GPA and students' reported feelings of encouragement, engagement, and support:

- **Encouragement**: r=0.23
- **Engagement**: r=0.26
- **Support**: r=0.21

These relationships suggest that students who feel more encouraged, engaged, and supported tend to perform better academically. The students who used the AI course assistant already had a lower feeling of engagement, encouragement, and support. The engagement with Spark helped them actively learn in the course and earn a higher grade, thus positively affecting their feelings of engagement, encouragement, and support. Therefore, addressing gaps in these areas—particularly for students who report lower levels of belonging—could directly impact their academic success.

Furthermore, the fact that these students had higher GPAs suggests that AI course assistants are beneficial academically, but they may also play a role in building emotional and social connections, critical components of belonging. By improving how AI assistants foster engagement, encouragement, and support, institutions can further enhance the sense of belonging among students.

Best Practices or Lessons Learned about AI and Belonging

A key takeaway and best practice are that the level of engagement and encouragement from the instructor significantly influences how many students will use and benefit from AI tools. The instructor's attitude and the value they place on the tool have a direct impact on

student adoption and utilization, making the professor's role crucial in driving student engagement with AI resources (Hanshaw, 2024). From a teaching perspective, faculty need to have an open mind about AI. There are still some faculty who are against AI because they think AI is a cheating tool students use to do their homework for them. Because Spark has been programmed not to do the work for the student, it makes for a great study buddy or virtual tutor for the student. Therefore, faculty who are resistant to AI or think AI is a cheating tool can train their customized AI not to do the work for them: that is what makes Spark a great addition to any online class (Ho, et al., 2024).

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