

AI-Powered Chatbots in Higher Education: Enhancing Personalized Learning and Ethical Innovation in Business Studies

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Abstract:

The integration of artificial intelligence (AI) in Higher Education is transforming teaching and learning processes, particularly in Business Education, where fostering innovation, critical thinking, and ethical awareness is essential (Ren & Lun Wu, 2025). This study presents the design, implementation, and evaluation of DattaBot, an AI-based chatbot developed to support undergraduate students in two courses: Creative and Innovative Thinking and Entrepreneurship and Innovation, within a Business Administration program at Universidad Loyola in Seville, Spain.

This educational innovation responds to the need to incorporate AI tools in a controlled, pedagogically grounded, and ethically responsible manner (Nicholas, 2025). Unlike general-purpose systems, DattaBot is built on faculty-curated content aligned with course materials and learning objectives, promoting the critical use of AI. Two chatbots were developed: *The Guardian of Ingenuity (La Guardiana del Ingenio)*, focused on creativity and Design Thinking, and *Sparkie*, oriented toward entrepreneurial processes such as opportunity recognition, value proposition design, and lean startup methodologies.

Methodologically, the project followed an iterative design–implementation–evaluation approach structured in four phases. In the design phase, both chatbots were configured through

prompt engineering and curated knowledge bases: the creativity chatbot included 73 structured documents, while the entrepreneurship chatbot was developed as a metabot integrating course materials (42 documents) and guidelines (3 documents).

In the testing phase, faculty and a pilot group of six students (older Business Administration students who had previously completed the courses) conducted iterative evaluations, generating 86 interactions for the creativity chatbot and 72 for the entrepreneurship chatbot, leading to refinements in prompts and response structure.

During implementation, the chatbots were integrated into Moodle, introduced at the beginning of the semester, and made continuously available. They were embedded within Challenge-Based Learning (CLB) and Project-Based Learning (PBL) environments, providing real-time academic support.

Finally, in the evaluation phase, interactions were monitored and student perceptions collected through post-course surveys (104 responses in creativity, 27% response rate; 35 in entrepreneurship, 73%). Usage peaks before exams and deadlines indicated alignment with students' learning needs.

Findings suggest that the chatbot enhanced understanding of course content, supported autonomous learning, and facilitated engagement with complex concepts. Students particularly valued the immediacy, clarity, and specificity of responses, as well as continuous availability beyond the classroom. The tool also supported critical thinking and problem-solving by guiding methodological processes, strengthening students' confidence when addressing challenges. From a teaching perspective, it reduced repetitive queries, supported the creation of applied resources, and provided insights into student learning through interaction logs, enabling more adaptive teaching.

While the implementation yielded positive outcomes, it also revealed limitations related to response accuracy, system performance, and students' preference for widely used general AI tools. These challenges highlight the need for a more intentional and critically guided pedagogical integration of AI.

This study aims to advance responsible AI integration in Business Education by showing that technology, when pedagogically grounded and ethically guided, can enhance personalised learning while preserving the centrality of the human person. In this sense, AI is not positioned as a substitute for teaching but as a means to foster critical reflection, student autonomy, and values-based learning aligned with Jesuit educational principles (Porth, Lee, & Buller, 2021).

References

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