Workshop - How to Develop a Chatbot in Less Than 90 Minutes: Hands-On Workshop on Emerging Technologies for Active Learning

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Abstract

In recent years, the rapid advancement of digital technologies, particularly generative artificial intelligence (AI), has significantly influenced how teaching and learning are designed, delivered, and experienced within higher education. One notable and increasingly relevant application is using chatbots as supportive tools for educators and students. Chatbots can reduce administrative workload, enhance student engagement, and enrich pedagogical strategies by facilitating active learning and personalised support. Despite their potential, these tools remain underexplored in many academic environments. This workshop offers an accessible and practice-oriented introduction to chatbot development, aimed at participants from all disciplines, regardless of their technical background. Through a structured six-step methodology and the use of Microsoft Copilot Studio, attendees will be guided through designing, building, and deploying a functional chatbot for active learning. The session combines theoretical insights with hands-on activities, including discussions on the broader implications of AI in education, exploration of advanced platform features, and critical reflections on technical and pedagogical limitations. By the end of the experience, each participant will have created a chatbot prototype applicable to their teaching practices or personal projects and will have gained a deeper, more critical understanding of the challenges and opportunities presented by artificial intelligence in contemporary educational contexts.

Keywords: Active Learning; Engineering Education; Chatbot; Artificial Intelligence.

1 Introduction

The development of new technologies and their impact on education has become an increasingly prominent topic of discussion in recent years (Souza & Debs, 2024). On the one hand, this context highlights the need to equip students with digital skills and competencies demanded by the labour market (González-Pérez & Ramírez-Montoya, 2022; Souza & Debs, 2024). On the other hand, using technology as a facilitative tool, reducing workload, enhancing engagement, and enriching learning strategies, has taken centre stage in pedagogical discourse (González-Pérez & Ramírez-Montoya, 2022). With the popularisation and accessibility of generative artificial intelligence language models in 2023, this debate has gained further traction, bringing discussion regarding assessment and plagiarism, for example.

In this context, a relatively simple yet still underutilised solution is the use of chatbots. These have been applied in academic settings to support educators, assist students, and streamline back-office tasks (Ramandanis & Xinogalos, 2023). Recent advancements in artificial intelligence have made chatbot development faster, simpler, and more accessible, even for professionals without a technical background in programming (Lopes et al., 2024).

Universities have produced numerous studies on applying active learning methodologies in engineering education (Lima et al., 2024). Approaches such as project-based learning, simulations, project management, and gamification have proven effective in enhancing student learning outcomes (Lima et al., 2023; Lopes &

Aquere, 2021; Pereira et al., 2018). In this light, the integration of chatbots and other digital technologies has emerged as a natural progression in pursuing educational improvement.

Drawing upon prior experience in developing educational chatbots, this workshop aims to share a six-step methodology that enables participants, regardless of their background in information technology, to design and implement a chatbot for a variety of educational purposes. Beyond creating a functional prototype, the workshop seeks to place participants in the position of a developer, thereby broadening their understanding of educational technologies and fostering more meaningful discussions regarding opportunities, challenges, and limitations.

The workshop consists of a hands-on session in which participants will build a chatbot in under 90 minutes for active learning. It will engage participants in collaborative discussions and interactive activities designed to deepen their perspectives on the use of emerging technologies in education. No prior technical knowledge is required; participants only need a Microsoft access to take part. During the workshop, one example will be developed, but participants are encouraged to bring their own resources (such as presentations, exercises, and notes) to train a chatbot tailored to their specific context.

2 Activities

The workshop will feature a combination of theoretical and practical activities, with the objective that by the end of the session, all participants will have learned how to deploy a chatbot suitable for use in their teaching practice, classes, or personal projects. Microsoft Copilot Studio will be employed as the primary tool, with participants engaging individually and collaboratively through active learning methodologies. The workshop is structured around six key phases:

1. Theoretical Introduction: A brief overview of the current context surrounding artificial intelligence, chatbot development, and key applications in active learning. The session will conclude with a *think-pair-share* activity during which participants define the focus of the chatbot they intend to develop. This segment aims to provide foundational knowledge and stimulate initial project ideation.
2. Designing a Chatbot in Six Steps: Participants will be introduced to the six-step methodology proposed by Lopes et al. (2024), with illustrative examples and a discussion of the key elements in each phase: Initial analysis; Definition of characteristics; Design; Implementation; Testing; and Evaluation. A template will be provided to help participants outline their chatbot concept, including its features, functionalities, and content.
3. Chatbot Development: This is the main hands-on segment of the workshop, where participants will follow a guided process using Copilot Studio. Demonstrations will be interspersed with practical exercises so that each participant can learn how to develop a chatbot tailored to their specific context. Topics covered include an overview of the platform, basic setup, providing knowledge sources, publishing options, and best practices for testing the prototype.
4. Advanced Features: This segment will present additional features of Microsoft Copilot Studio, including flow automation, integration with tools such as Power Virtual Agents, Microsoft Teams, and others within the platform. The goal is to inspire future further exploration beyond the scope of the workshop.
5. Limitations and Alternative Tools: A brief presentation of the limitations encountered during chatbot development, with comparisons to other tools on the market. Participants will be invited to share their experiences, identify difficulties, and reflect on limitations discovered during the session.
6. Final Discussion and Evaluation: The workshop will conclude with a final discussion of the development process, its challenges and opportunities, and the completion of a questionnaire collecting both

qualitative and quantitative feedback on the six-step methodology and perceptions of chatbot use in active learning.

3 Expected results

Each participant will leave the workshop with a tangible outcome: a chatbot prototype for active learning, personal projects, or other endeavours. In addition, the session will generate outputs from the discussions held throughout.

Through this interactive, hands-on experience, participants are expected to not only develop and deploy a chatbot but also deepen their understanding of generative artificial intelligence, including its potential, limitations, and implications. Discussions will address these aspects in relation to higher education and emerging technologies more broadly. By engaging in this project-based format, participants are expected to expand their perspectives on a topic of growing relevance in contemporary education.

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