Good Practices in AI Use: Case Studies from Spain

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Abstract

This paper presents the outcomes of the implementation of artificial intelligence (AI) tools during co-creation workshops conducted within the framework of the Erasmus+ project AI-ENABLE – Enhancing Inclusive Education in Higher Education Institutions with Artificial Intelligence. Two case studies - one from the Faculty of Social and Human Sciences and the other from the Faculty of Engineering - are examined to illustrate how the integration of AI-driven tools can enhance inclusivity and transform traditional classroom environments. The findings underscore the need for future higher education practices to prioritize the long-term implications of AI, the development of comprehensive AI literacy programs, and the adoption of innovative pedagogical strategies aimed at fostering inclusive learning environments.

Keywords

AI tools, inclusive digital education, higher education, good practices, case study, personalized learning.

1 Introduction

Although the potential of artificial intelligence (AI) in education is broadly acknowledged [1, 2, 3], the study on its practical implementation and alignment with inclusive pedagogical practices remains underdeveloped. This paper addresses this gap by critically examining AI tools, assessing their applicability to inclusive education, and implementation it in the real higher education classroom setting. Furthermore, the study presents findings from institutional pilot projects conducted with co-creation workshop approach. By integrating these dimensions, the authors provide a comprehensive overview of AI-supported inclusive education and offer evidence-based recommendations for higher education institutions (HEIs), policymakers, and educators to promote the equitable and ethical integration of AI in teaching and learning.

The paper consists of four sections. Section 2 provides an overview of AI tools and their potential to enhance inclusive higher education. Section 3 outlines the structure, content, and outcomes of the co-creation workshop, which explored both the benefits and barriers to adopting AI in university classrooms. The implementation of AI tools is described in detail through two specific use cases. Finally, section 4 concludes with key insights regarding the implementation of AI-driven tools, based on the two use cases from the University of Deusto, Spain.

2 State of-the-art of Inclusive AI

Artificial intelligence (AI) tools in education have demonstrated considerable potential to enhance student involvement, streamline administrative processes, and enrich overall learning experiences. To explore the current landscape of educational AI applications, a comprehensive web-based review was conducted under the AI-ENABLE project's task *State of the art analysis of AI technologies and tools and their integration in education*. This review involved the identification, documentation, and classification of a wide range of AI tools relevant to educational settings. Each tool was analyzed according to the technology, potential application, and licensing model. The tools identified span various domains, including programming support, media processing, chatbot interactions, and research facilitation, with licensing options ranging from free access to subscription-based services. This mapping activity was completed in September 2024 [4]

The rapid and continuous development of AI technologies is the reason why the collection of outcomes presented in AI-ENABLE is not complete and could be already out of date. As such, it is imperative that educators and institutional stakeholders remain proactive in monitoring and evaluating emerging AI tools to ensure alignment with the evolving needs of modern, technology-enhanced education.

Inclusive education, as a foundational principle of equitable learning, ensures that all students, regardless of their abilities, backgrounds, or learning preferences, have access to meaningful and effective educational opportunities. AI-powered tools represent a transformative approach to inclusive pedagogy, enabling educators to create adaptive, accessible, and personalized learning environments. These tools support differentiated instruction, assistive learning technologies, and

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http://doi.org/DOI_RECEIVED_AFTER_REVIEW

enhanced student engagement strategies, thereby fostering inclusive classroom practices.

Figure 1 illustrates the interconnection of various categories of AI tools and their contributions to inclusive course delivery. Below, selected examples of AI-driven tools that support inclusive education are presented.

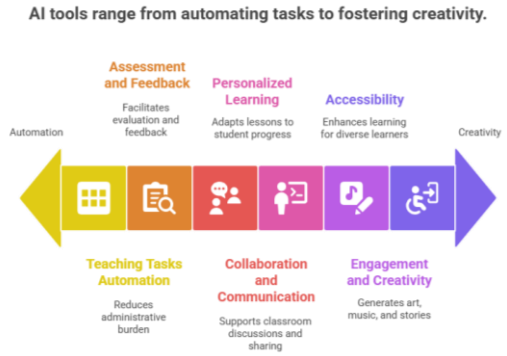

Figure 1: Using AI Tools for Inclusive Education (*created with Napkin.ai*)

2.1 Teaching Tasks Automation

AI tools help minimize administrative burdens and promote professional development for educators by supporting tasks such as grading, scheduling, and lesson planning (TeacherMatic, Teachology AI, TeacherDashboard.ai); proposing diverse and accessible materials (SALLEY, CourseGenie); offering inclusive best practices (Educator Lab, Almanack); providing AI-powered classroom management (AITeacha, Interflexion).

2.2 Assessment and Feedback

AI-powered assessment tools facilitate evaluation and feedback by designing quizzes from lessons or videos (Quizgecko, Yippity, Conker, Video2Quiz); creating customized tests and activities (MagicSchool, ClassPoint AI, TeacherToolsGPT); enhancing writing (Grammarly, QuillBot, Bard); summarizing research (PaperBrain, Scholarcy); ensure fair evaluation through detecting plagiarism and automating grading (Smodin, formative); tracking student performance and tailoring interventions (TeacherDashboard.ai).

2.3 Personalized Learning

AI-driven tutoring tools like ChatGPT, Claude AI, YouChat, and AcademicGPT offer continues personalized support, helping students grasp complex concepts at their own pace. Cognimates AI, Perplexity AI, and Ai Tutor self-direct students by guiding problem-solving. Carnegie Learning and Docebo platforms assess student progress and adapt lessons, while Moodle's AI plugin creates dynamic assessments. Flint, MyLessonPal, and CourseMind assist educators in managing personalized learning effectively.

2.4 Collaboration and Communication

AI supports communication and collaboration in the classroom by facilitating discussions & knowledge sharing (Claude AI, Socrates.ai); converting materials into flashcards and conversations (Jungle.ai, ChatPDF); assisting multilingual lessons (Polyglot Media); generating grasping presentation (Canva, MagicSlides, SlidesAI, Genially).

2.5 Accessibility

AI tools enhance accessibility for diverse learners by offering: text-to-speech, translation, and sign language interpretation (e.g., DeepL, Alexa/Siri, Google Assistant); AI-driven summarization and voice interaction for reading difficulties (e.g., Semantic Reader, TalkingPDF, AudioPen); text-to-audio conversion for visual impairments and dyslexia (Listening, Audioread, Amberscript); complex-to-simple texts for cognitive challenges (Diffit, Eduaide); lecture transcription for hearing impairments (Otter, Fireflies).

2.6 Engagement and Creativity

AI tools improve engagement and equip diverse learning styles through generating art and visualizing concepts (Midjourney, DALL-E, Canva, Napkin.ai, etc.); creating music or listening AI-generated explanations (MusicLM, Audiosonic); converting text to video for abstract topics (Fliki, HumanPal); AI-powered storytelling (StoryBooks); gamified interactive quests (Adventure AI, Gamify Learning, Kiwi Video).

Therefore, AI-powered tools are streamlining and transforming education by delivering personalized learning experiences, simplifying administrative tasks, and handling inclusivity. Through adaptive and emerging learning technologies, accessibility features, and dynamic content creation, these tools provide tailored support for diverse learners, helping to create an inclusive and effective educational environment.

3 Co-creation Workshop: Exploration of AI Tools for Pedagogical Innovation

A co-creation workshop including three sessions was implemented at the University of Deusto. The initial session introduced the AI-ENABLE project, outlining its goals, objectives, target audience, and overall structure. Participants engaged in a critical analysis of the benefits, challenges, and barriers associated with the integration of AI-driven applications in educational settings [5]. The second session focused on the principles of Universal Design for Learning (UDL) [6] and its application within engineering higher education. The AI-ENABLE scenarios illustrating the use of AI tools to support inclusive teaching practices in engineering classrooms were presented. Participants then began developing their own scenarios for integrating existing AI tools into their respective courses. Over the following weeks, these scenarios were implemented and tested in classroom environments. In the concluding session, educators met again to share, reflect upon, and discuss the outcomes of their designed scenarios.

3.1 Use Case 1: Community Service Study

This case was incorporated into a Community Service Study within the Social Work Degree program. 15 second-year students from diverse academic disciplines, including Psychology, Engineering, and Business, all of whom have chosen a community service pathway participated in the study. The implementation plan for integrating AI tools was designed to

address two primary objectives: (1) *student support*, by enhancing reading comprehension and providing tailored accommodations for a student with special needs; and (2) *community engagement*, by facilitating effective communication with diverse populations, including older adults, immigrants for whom Spanish is a second language, and individuals with intellectual disabilities or cerebral palsy.

In the "Social Engagement and Values" course (FAV, 2nd year) of the Social Work Degree, Grammarly for writing feedback, Napkin for visualizing content and ideas, Anki for creating the game-based learning approach, Ginger for sentence restructuring, and Voiceitt for supporting individuals with atypical speech were applied.

Napkin (https://www.napkin.ai/) enhances and adapts diagrams, visualizes teachers' notes and creates engaging class presentations. This tool allows for dynamic and intuitive diagramming, enabling instructors to refine complex concepts, tailor visual content to diverse learning needs, and foster deeper student understanding. Integrated into instructional practice, Napkin allows teachers to:

- Adapt diagrams to align with lesson goals and diverse learning styles.
- Visualize notes by converting content into clear, engaging formats that aid retention.
- Create presentations with accessible, interactive slides supporting varied learner needs.

Napkin improves the clarity and accessibility of educational materials, contributing to a more interactive and inclusive learning environment.

Voiceitt, (https://www.voiceitt.com/) is an inclusive voice AI tool designed to support both knowledge acquisition and the development of interpersonal competencies essential for meaningful and inclusive community engagement. The tool translates atypical speech into standard, intelligible speech, thereby enhancing communication accessibility.

Initially, Voiceitt was employed to process video testimonies from diverse community members, including older adults, individuals with cerebral palsy, and newcomers facing pronunciation challenges that contribute to language barriers. Subsequently, it was integrated into live conversations with these groups. These interactions offer students valuable insights into the lived experiences, perspectives, and specific needs of marginalized populations, thereby fostering empathy, awareness, and social sensitivity. This experiential learning activity equips students for effective engagement with similar communities throughout their academic and professional practice. Voiceitt contributes to the following learning outcomes:

- *Deeper understanding:* Community narratives offer practical insight into inclusion, accessibility, and communication.
- *Improved empathy and communication:* Exposure to authentic voices fosters respectful, effective interaction with diverse individuals.
- *Professional readiness:* Builds cultural competence and key skills for ethical, impactful community service.

Ginger (https://www.gingersoftware.com/) is an AI-driven writing assistant designed to correct grammar, enhance stylistic quality, and provide context-sensitive language refinements. It was implemented to support students in improving reading comprehension and to assist learners with dyslexia by simplifying complex language and elucidating challenging terminology. For example, Ginger deconstructs abstract vocabulary such as "commitment," which may be conceptually advanced or contextually nuanced for certain students.

The integration of Ginger into the educational process has facilitated comprehension of reading materials, understanding of abstract and sophisticated terms, and increased learner confidence in both reading and writing tasks. It was noted that by offering precise explanations and alternative phrasings, the tool has enhanced accessibility to academic texts, thereby promoting deeper cognitive engagement and critical thinking while mitigating frustration and supporting sustained interaction with course content.

Anki (https://apps.ankiweb.net/) is a flashcard-based learning tool that supports knowledge retention through repetition, expression, and practice. In the classroom, it effectively presents key terms and concepts using spaced, randomized repetition, engages students with interactive flashcards that reinforce understanding, supports language development by enhancing vocabulary through structured review and promotes systematic learning and reinforces core concepts in an accessible format.

Grammarly (https://www.grammarly.com/) supports a self-directed writing process by providing students with personalized, AI-driven feedback. Students begin by reviewing their own diary entries or notes and identifying areas for improvement. During class, they participate in peer review sessions, exchanging feedback to refine their ideas and strengthen arguments. After incorporating peer suggestions, students use Grammarly independently to polish their work -improving grammar, clarity, logical flow, and overall coherence.

This iterative process fosters continuous writing improvement. The final activity involves a structured key-sharing session, where students present their revised texts and reflect on their learning progress.

3.2 Use Case 2: Software Process and Quality

Engineering lectures traditionally depend on text-heavy slides, monochromatic diagrams, and code examples. The main objective of AI-driven tools adoption was to enhance the visual aspect of these lectures for Software Process and Quality subject. Many concepts within Agile methodologies and DevOps tools—requiring thorough understanding—are often represented through graphical elements such as boards and charts. Consequently, it is essential to employ tools that provide descriptive access to these visuals for learners who rely on reading/writing accommodations and for students with visual impairments. Additionally, efforts should be directed towards disrupting the predominance of textual content by integrating concise, synthesized charts that are also accessible through descriptive means for blind individuals. The AI tools selected to achieve the objectives were Microsoft Seeing AI, CLIP interrogator, Napkin.ai, GitHub copilot and ClickUP. The testing protocol included:

1) To explain a SCRUM's burndown chart, the CLIP Interrogator tool was used by importing the SCRUM's burndown chart into it. The resulting prompt — "a bar chart with the words sprint burndown chart, only with blue, rutkowski |, retaildesignblog.net, agile, unique features, desk fan, steps 50, oddly familiar, centered in image, wotc, very accurate coherent

image, uplifting mood, enterprise workflow engine, absolute chad, burn, ux" - failed to accurately capture the chart's essential information. This demonstrates the tool's limitations in interpreting data-driven visuals, requiring a more refined prompting strategy.

2) Importing the burndown chart into ChatGPT and using the prompt 'explain this burndown chart' produced sufficient and adequate results. Hence, ChatGPT provided clear and insightful feedback, beginning with the 'Key Takeaways':

a) *Consistent Work Done*: The team is reducing work at a steady rate (5 points per iteration).
b) *Remaining Work Trend*: The team appears slightly behind the ideal burndown line.
c) *Project Completion Prediction*: If the team continues at this pace, they may need extra time to complete all the planned work.
d) *Actionable Insights*: The team can assess whether they need to adjust workload distribution, increase velocity, or modify sprint goals.

3) ClickUp, proved to be a valuable tool in the classroom, particularly during lessons on Agile project planning. Collaborative work is a key component of engineering education, involving role definition, task planning, and progress tracking—areas where ClickUp was effectively utilized. Students shared their projects with the instructor, enabling real-time monitoring of their progress. This visibility helped identify groups facing difficulties, allowing for timely intervention and support. Additionally, the Trello-ClickUp integration streamlined workflow by automatically generating ClickUp tasks from new Trello cards, ensuring synchronization across multiple teams.

4) Napkin.ai was used to generate diagrams, graphs, and visual explanations to enhance the slides used in previous courses. For instance, Figure 2, generated for the SCRUM unit, provides a good slides' summary.

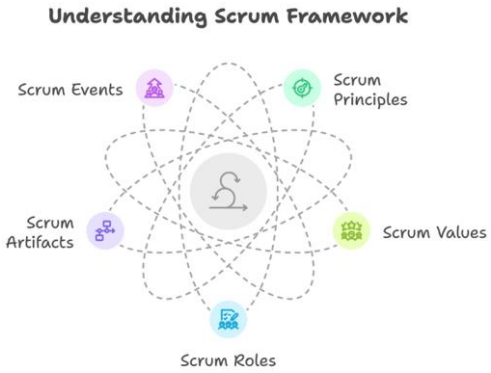

Figure 2: Using AI Tools for Inclusive Education (*created with Napkin.ai*)

5) Seeing AI: Talking Camera for the Blind was tested to help students with visual impairments receive descriptions of classroom activities and better understand the education charts through clear and detailed narration. This app is available on the App Store and Google Play. Furthermore, this tool can supplement traditional screen readers such as JAWS and/or Narrator.

6) Students integrated GitHub copilot into their learning programming workflow, thus receiving support for various coding activities.

As a summary, lecturers found these tools beneficial for ability to make learning more interactive, breaking the monotony of passive lectures. These brief interruptions help sustain attention, reinforce content, and keep students engaged. It is also important to show that generative AI can enhance learning without encouraging passivity.

3.3 The teacher's voice

The following testimonies reflect the overall positive experience provided by lecturers. *"I find beneficial" … "their ability to foster presence, participation, and learning-driven empowerment… Spanish versions availability is a significant advantage"; "the available for each variety task allows students to choose the best fit for their individual needs and work/learning styles"; "the easy and intuitive usage of these tools"; "help many students grasp complex topics and conceptual relationships". "However, I have concerns regarding "AI tools, specifically regarding intellectual property rights, data privacy, and the implementation of subscription fee after an initial period of user engagement"; "that students rely too much on AI, substituting it for their own effort and hindering independent learning"; "data privacy is a concern for me. Where does the information go? It's quite sensitive. What about the rights to my information?"*

"At the beginning of the session, I was reluctant about using AI in the classroom. However, I have now changed my mind."

4 Conclusion

This paper presents two use cases implemented during co-creation workshops at the Faculty of Social and Human Sciences and the Faculty of Engineering at the University of Deusto. It highlights the transformative role of AI-driven technology in higher education, promoting inclusivity through personalization, accessibility, and ethical practices. During the AI-ENABLE workshop sessions, selected AI tools were tested and piloted in classrooms. As a result, educators reported significant benefits from AI integration; however, they also identified key challenges such as algorithmic bias, ethical concerns, and unequal access. These risks can be mitigated through AI literacy training, transparent policies, and continued human oversight in AI-assisted learning. Addressing these issues will require collaboration among educators, policymakers, technologists, and researchers.

Acknowledgments

This research was conducted as part of the "AI-ENABLE: Enhancing Inclusive Education in Higher Education Institutions with Artificial Intelligence" project (2023-1-SI01-KA220-HED-000160853). Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

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