Exploring the Feasibility of Integrating Personalised AI in Project Work and Its Impact on Student Learning and Staff Load

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Abstract

Collaborative project-based learning can require increased staff support compared to other learning techniques but where there are limitations in staffing and staff capacity, tailored AI tools may become a solution. The aim of this work is to assess whether the emergence of more personalised AI tools could both reduce staff load and enhance student learning and experience in project work, as a means of assessing whether these tools could be more permanently integrated into the curriculum. Student learning was assessed via the use of surveys to students enrolled on the Regenerative Medicine module who partook in a team-based Design Project and impact on staff load was assessed via interviews with module staff. 100% of the students on this module partook in this study (17 students -10 male, 7 female). These students evaluated the personalised tool "Vitafluence AI", with findings indicating its positive impact on learning. Over half (53%) reported increased academic confidence, and more than half recommended its integration into formal academic support. While 47% believed it could partially substitute an educator's assistance, none viewed it as a full replacement. The data also showed that 70% of the students felt encouraged to ask more questions but this had an impact on staff workload as 88% of students still needed to ask further questions to the module leader. Whilst there was no significant difference between male and female responses, one thing of note was that female participants felt less confident in the AI tool's impact on their academic performance.

Keywords: project-based learning, personalized artificial intelligence, student learning experience, education, regenerative medicine

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Introduction

AI has rapidly become an integral part of the labour market. According to the Future Jobs Report 2025 by World Economic Forum, 39% of the core worker skills will change by 2030. The top 3 fastest growing skills will be artificial intelligence (AI) and big data, networks and cybersecurity, and technological literacy. Hence, it is highly important for educators to ensure that the students leave higher education institutions capable of using these skills in practice. The best approach to achieve this is with the integration of AI into the modules, where it is appropriate, and teaching students to use it critically, instead of banning its use in education outright.

Studies have been conducted to ascertain the impact of AI in education. Vieriu and Petrea examined the impact of Artificial Intelligence (AI) on students' academic development at the National University of Science and Technology POLITEHNICA Bucharest in 2025. Among 85 surveyed students, 95.6% reported using AI tools, primarily virtual assistants, educational platforms, and automated content generators. Most students (over 80%) believed AI improved their academic performance, efficiency, and understanding of complex topics by facilitating faster access to learning resources and supporting study organizations. Despite these benefits, participants raised concerns regarding the accuracy of AI-generated information (48.2%), reduced critical thinking, and over-dependence on technology. Students emphasized the need for structured AI integration into the curriculum, ensuring accuracy, accessibility, and ethical guidance. The authors conclude that AI holds substantial potential to enhance personalized and efficient learning, but its adoption must be balanced with human oversight, critical thinking development, and data privacy safeguards. They advocate formal educational strategies, ethical frameworks, and continued research to ensure AI supports learning rather than replacing essential cognitive and social processes (Petrea & Vieriu, 2025).

Wang et al. (2024) conducted a systematic literature review on Artificial Intelligence in Education (AIED), analysing over 2,200 studies and 125 empirical papers. They have identified four major application areas: adaptive and personalized learning, intelligent assessment and management, student profiling and prediction, and emerging technologies such as chatbots and educational robots. Most studies focused on system design (53%) and learning impact (39%), with fewer examining adoption challenges or ethical implications. Experimental methods dominated the research, and theoretical grounding drew from constructivist, cognitive, and learning style theories. Higher education emerged as the most studied context, while preschool education remained underrepresented. The authors highlight growing interest in human–AI collaboration, generative AI, and emotion-aware learning, emphasizing the need for stronger ethical frameworks and theory-driven approaches to guide future AIED development and integration (Wang et al., 2024).

Further impact studies were conducted by Walter in 2024. The research found that 95.6% of students actively use AI tools, primarily virtual assistants and educational platforms to support their studies. Most students (80–83%) believe AI enhances efficiency, understanding, and organization, with major benefits including time savings, simplified comprehension, and structured information management. However, concerns were also identified: 48% questioned the accuracy of AI-generated information, while others cited risks such as over-reliance on technology, reduced critical thinking, and potential academic dishonesty. Despite these drawbacks, the study concludes that AI significantly improves personalized learning and academic engagement when applied responsibly. It recommends integrating AI with traditional

teaching, supported by ethical guidelines, validation mechanisms, and balanced use to ensure reliability and maintain human-centered learning (Walter, 2024).

When addressing wellbeing, Pikhart and Klimova (2025) highlighted that despite the enhancement in the personalized mental health support, significant drawbacks are also identified: digital fatigue, technostress, loneliness from reduced face-to-face interactions, diminished interpersonal skills, and privacy or job-displacement concerns as AI permeates academic settings (Pikhart & Klimova, 2025).

Some students may feel hesitant to ask questions due to various EDI (Equality, Diversity, and Inclusion) considerations, such as language barriers or discomfort speaking in front of their peers. This makes it crucial to develop a tailored AI tool like Vitafluence to support students in understanding lecture and task materials, rather than relying on general AI solutions. General AI tools often struggle to provide specific and accurate answers to course-related questions. By training the software with lecture materials and relevant literature, we aim to create a tool that effectively addresses students' needs and enhances their learning experience.

Improved Student Accessibility and Confidence: By tailoring the AI tool to the specific needs of the course, we aim to create an inclusive learning environment where students, regardless of language proficiency or other EDI considerations, feel comfortable seeking help. This tool will empower students to access accurate and relevant answers independently, boosting their confidence and reducing barriers to engagement. Reduced Staff Workload and Enhanced Efficiency: The project seeks to alleviate the teaching staff's workload by enabling the AI tool to address frequently asked questions and provide on-demand support. This will allow staff to focus on more complex or personalized interactions with students and better manage their time across multiple groups. Scalable and Transferable Teaching Solutions: If successful, this AI tool could serve as a model for broader implementation across other modules and faculties. This would enhance teaching efficiency and consistency while supporting a larger and more diverse student population.

Vitafluence by LakeSai

Vitafluence is an innovative research, data, and artificial intelligence (AI) company dedicated to advancing solutions in the health and life sciences sector. The company integrates scientific research, advanced analytics, and intelligent automation to transform how health data is collected, interpreted, and applied to improve patient outcomes and healthcare delivery.

Vitafluence provides comprehensive health analytics, real-world data insights, and quality-of-life metrics that support clinical research, healthcare decision-making, and population health management. Its proprietary Lakes AI platform offers a flexible, modular architecture that can be customized to meet specific client needs, from clinical trial data management to digital health analytics and predictive modelling. The company also offers an AI-driven chatbot system that can be deployed across any module or project. The chatbot interacts intelligently with uploaded datasets, enabling users to query data, access insights, and generate automated reports efficiently.

Methodology

Research Approach

The study was conducted with third-year undergraduate students enrolled in the Regenerative Medicine Minor within the Faculty of Engineering. It took place during Term 2 (January–March 2025) over a period of approximately 10 weeks. The cohort consisted of 29 students, who worked collaboratively in groups of five on a design-based project. The module was jointly supervised by two academic staff members.

A range of investigative techniques were considered for this research, including focus groups, questionnaires, surveys, staff interviews, and direct observations. Among these, quantitative methods, specifically surveys, were selected as the primary data collection approach (Jain, 2021). As the module was structured into four components, students were asked to complete a short survey upon submission of each part to assess whether the software used supported their group work at each stage.

The survey included eight questions, and 17 students participated in completing it. In addition, semi-structured interviews were carried out with the teaching staff to capture their perspectives and reflections on the use of the software within the module.

Questionnaire Formulation and Ethical Considerations

The questions on the survey needed to reflect the intended aims and outcomes of the project.

Objectives

- The aim is to evaluate whether the tailored tool, aligned with lecture materials and resources, can effectively support students and alleviate staff workload, particularly when managing multiple student groups.
- This collaboration focuses on leveraging the “Teaching Assistant” tool to enhance the teaching activities within the Department of Biochemical Engineering.

Outputs

- Survey third year undergraduate students.
- Collecting feedback from teaching staff.

Outcomes

- An improved understanding of the impact of Vitafluence on group work and on staff workload.
- Presentation of results at the Departmental Teaching Committee (DTC) with potential implementation on other modules where relevant.

Results and Discussion

The project was aimed to assess the impact of Vitafluence AI on student learning experience and staff load. The results are detailed in the next sections.

Evaluation of Impact on Student Learning Experience

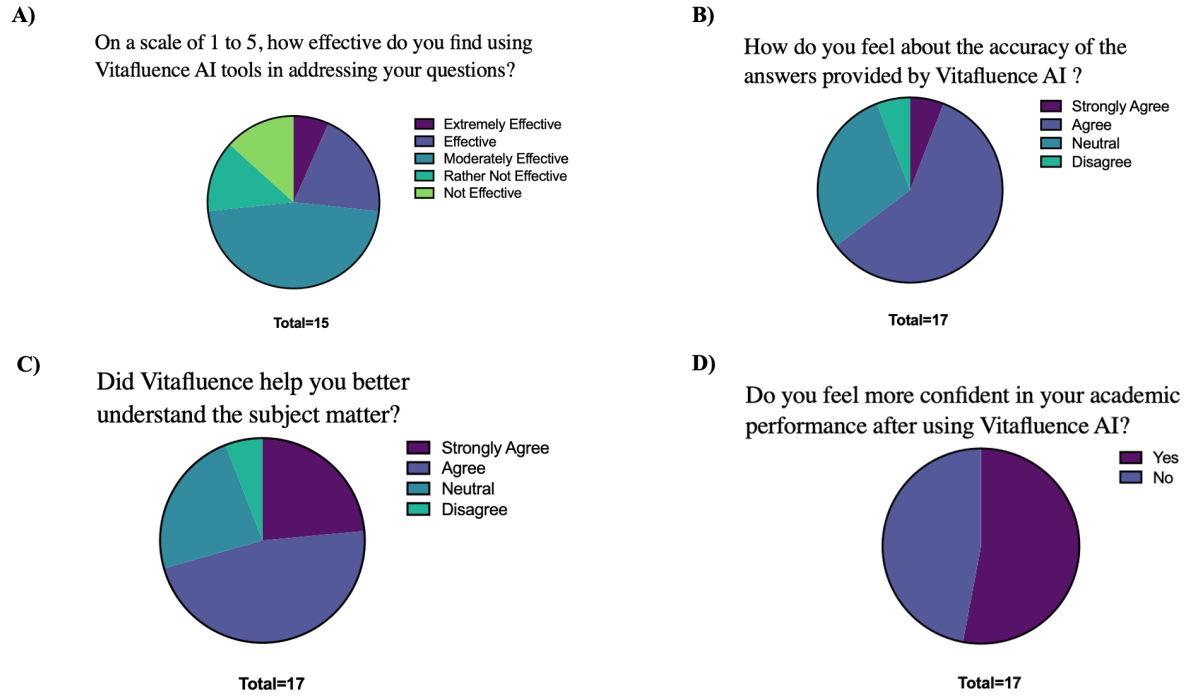
Students were surveyed following all 4 sections of the projects using 8 questions. The survey consisted of 4 questions assessing the quality of the AI support and 4 questions analysing the impact on student engagement with the academic staff. In total, 17 students filled out the survey. There was no significant difference between male and female responses, but female participants felt less confident in the impact of the AI tool.

Assessing Quality of AI Support System

First part of the survey was aimed to evaluate the quality of the Vitafluence AI support system tailored specifically for the Regenerative Medicine module. Hence, 4 factors were accounted: effectiveness, accuracy, impact on student understanding, confidence after using AI. The results are demonstrated as pie charts on Figure 1.

Figure 1

The Results of the First Part of Student Learning Experience Survey of the Regenerative Medicine Team-Based Design Project



Note. All data is demonstrated as pie charts. The first part was aimed to assess the quality of the support system provided by Vitafluence AI, accounting the following factors: **A)** Effectiveness of AI **B)** Accuracy of AI **C)** Impact of AI on student understanding **D)** Confidence after using AI.

73% of the students found the utilization of Vitafluence AI moderately or more effective. 65% of the students agreed or strongly agreed that the system is accurate. 71% of the students agreed or strongly agreed that the system helped better understanding of the subject matter. 53% of

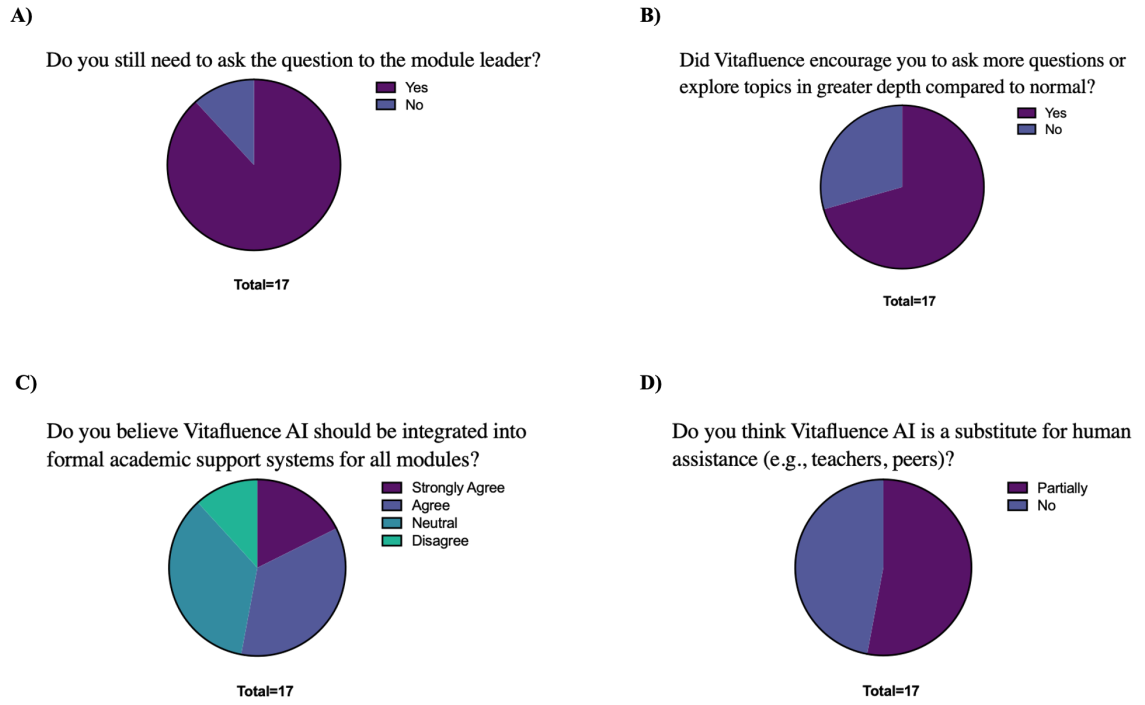
them reported increased confidence in their academic performance. The data suggests that the AI system provided quality service to the students and helped them in designing their regenerative medicine group projects.

Assessing Impact on Student Engagement With Academic Staff

The second part of the survey was aimed to evaluate the impact of the AI support system on the student engagement with the academic support stuff and the module lead. The survey incorporated the following questions: If students have further questions after using AI; If AI encourage students to ask more questions; If AI should be integrated to formal academic support systems; If it could substitute human assistance. The results are demonstrated as pie charts on Figure 2.

Figure 2

The Results of the Second Part of Student Learning Experience Survey of the Regenerative Medicine Team-Based Design Project



Note. All data is demonstrated as pie charts. The second part was aimed to assess AI's impact on student engagement and communication with the staff, accounting the following factors: **A)** If students have further questions after using AI **B)** If AI encourage students to ask more questions **C)** If AI should be integrated to formal academic support systems **D)** If it could substitute human assistance.

88% of the students still needed to ask questions from the module lead. 71% of the students felt encouraged to explore the topics in greater depth compared to normal. 54% of the students agreed or strongly agreed that the system should be integrated into the formal academic support systems for all modules, while 35% was neutral on this subject. 53% of them said AI could only partially substitute for human assistance, while 47% said it could not substitute at all.

Based on the presented survey data, the AI provides quality support system for the students, which enables them to explore the subject matter much further. Hence, more than half of the students suggested the tailored AI chatbots integration into formal academic support systems for all modules. On the other hand, as an effect of deeper research, they were encouraged to ask

more questions to the module lead, increasing the staff load of the module. In addition, all students recognised the importance of the academic staff, and no one viewed it as a full substitution. Hence, the integration of AI contributes rather to the understanding of the topic, brainstorming and encouraging the students, than teaching and supervising them.

It is important to note, that the sample size of the survey was low. To increase the scientific power of the demonstrated data, the study scale should be increased to further modules.

Evaluation of Impact on Staff Load

Based on the interview with the module lead the software helped in some sections of the report, especially in literature review and calculations (e.g. finding the growth rate, rules of thumb for bioprocessing). The software provided new ideas for project implementation and the students explored the subject in greater depth. However, due to bottlenecks in the software, further improvement and training is required from the company. In addition, the AI did not reduce the staff load. The students still asked technical format and general question related to topic. Furthermore, they wanted to check the feasibility of the project with the help of the academic staff.

Conclusion

In this report, we evaluated the integration of the Lakes AI platform by Vitafluence AI to a collaborative project-based regenerative medicine module. The results were based on student survey and interview with academic staff. The students recognised the help of the system, they were able to explore the topics in further depths and they reported increased confidence in their academic performance. On the other hand, no one viewed the system as full substitution. With increased exploration of the topics, the student had even more question to the module lead. In conclusion, the student learning experience was enhanced, while the staff load did not reduce. The current study only had limited sample size, so increase in the scale of the study is suggested. In addition, software should be further assessed for new ideas in project implementation. To enable this, further software updates and training is required from Vitafluence AI. Concurrent to this study, the company have worked on substantial improvements to the software. The next iteration of this study will look to include the software enhancements to determine whether it is something that can be integrated into the curriculum.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The author declares that AI-assisted writing software, was not used regularly in proofreading and refining the language used in the manuscript. The usage was limited to correcting grammatical and spelling errors and rephrasing statements for accuracy and clarity. The ideas, design, procedures, findings, analyses, and discussion are originally written and derived from careful and systematic conduct of the research.

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