

Changemakers: Creativity and Value Creation

University of Wales Trinity Saint David

Module: “Changemakers: Creativity & Value Creation”

Programe: HN/BSc Computing Portfolio

URL link: <https://1drv.ms/o/c/bc93f0cb9fba42c3/IgD19Kkml5-FT5WGaNf4m-YhAcHEIA7ULxr4msOK2esnouM>

Name: Alexandr Iancovski

Student Number: 2423378

Date: 31 March 2026

Introduction

This project proposal explores the development of an AI-powered chatbot designed to support university students in their academic and personal activities. In recent years, the integration of digital technologies, particularly artificial intelligence, has significantly transformed the education sector. These technologies provide new opportunities to enhance learning experiences, improve accessibility, and address common challenges faced by students. This project aims to contribute to improving student support systems by offering a scalable and accessible digital solution.

The purpose of this proposal is to investigate how innovation and creativity can be applied within a computing context to develop a practical solution that creates value. The project focuses on identifying student needs, designing an appropriate technological solution, and applying research methods to evaluate its effectiveness.

This proposal is structured into three main tasks. Task 1 focuses on ideation and the role of innovation and creativity. Task 2 outlines the aim, objectives, and research approach. Task 3 discusses research strategies, including data collection and analysis methods. Together, these sections provide a comprehensive plan for the development of the proposed AI chatbot system.

Task 1: Ideation & Mind Map

Main Topic: Innovation, Creativity and AI in Education

Innovation and creativity play a fundamental role in shaping modern society, particularly within the field of education. Innovation refers to the process of developing new ideas, products or methods that create value, while creativity is the ability to generate original and useful ideas. Together, they contribute to technological advancement and improvements in quality of life (OECD, 2019).

In recent years, digital transformation has significantly impacted education systems worldwide. Technologies such as Artificial Intelligence (AI) are increasingly being used to enhance learning experiences, improve accessibility, and support students in achieving their academic goals. AI-based systems can analyse user behaviour, provide personalised recommendations, and automate routine tasks, making them highly valuable in educational environments (Holmes et al., 2019). The adoption of AI in education has been shown to improve learning outcomes and provide more personalised support for students (Baker & Siemens, 2014).

Role of Creativity and Innovation in Society

Creativity and innovation are essential drivers of economic growth and social development. They enable organisations and individuals to solve complex problems and adapt to changing environments. In the context of education, innovation can improve teaching methods, increase student engagement, and address challenges such as lack of support and accessibility.

For students, creative thinking skills are crucial for problem-solving and critical analysis. Universities increasingly encourage students to develop innovative solutions that can create value not only for themselves but also for society. This aligns with the concept of "changemakers," where individuals actively contribute to positive societal change.

Personal Interest Area: Computing and Artificial Intelligence

As a Computing student, the area of Artificial Intelligence is of particular interest due to its rapid development and wide range of applications. AI technologies, including chatbots, machine learning, and natural language processing, are transforming industries such as healthcare, finance, and education (Russell and Norvig, 2021)."

One of the key areas where AI can provide value is student support systems. Many students face difficulties in managing their studies, accessing information, and receiving timely assistance. Traditional support services are often limited by time and availability, which creates an opportunity for technological solutions.

Project Ideas

Several potential project ideas were considered within the context of computing and innovation:

- Development of a mobile application for student time management
- Creation of a cybersecurity awareness platform for students
- Design of an AI-powered chatbot for academic support

Each of these ideas addresses a specific problem faced by students and has the potential to create value. However, the AI chatbot solution stands out due to its scalability, accessibility, and relevance in modern digital environments. Compared to a mobile time management app or a cybersecurity awareness platform, the AI chatbot offers continuous, scalable support. Unlike static platforms, it can learn from student interactions, adapt responses, and provide personalised guidance. This ensures that students receive timely and relevant support tailored to their unique learning needs.

Selected Project Idea

The selected project idea is the development of an AI-powered chatbot designed to support university students. The chatbot will provide assistance with academic queries, deadlines, course-related information, and general student support.

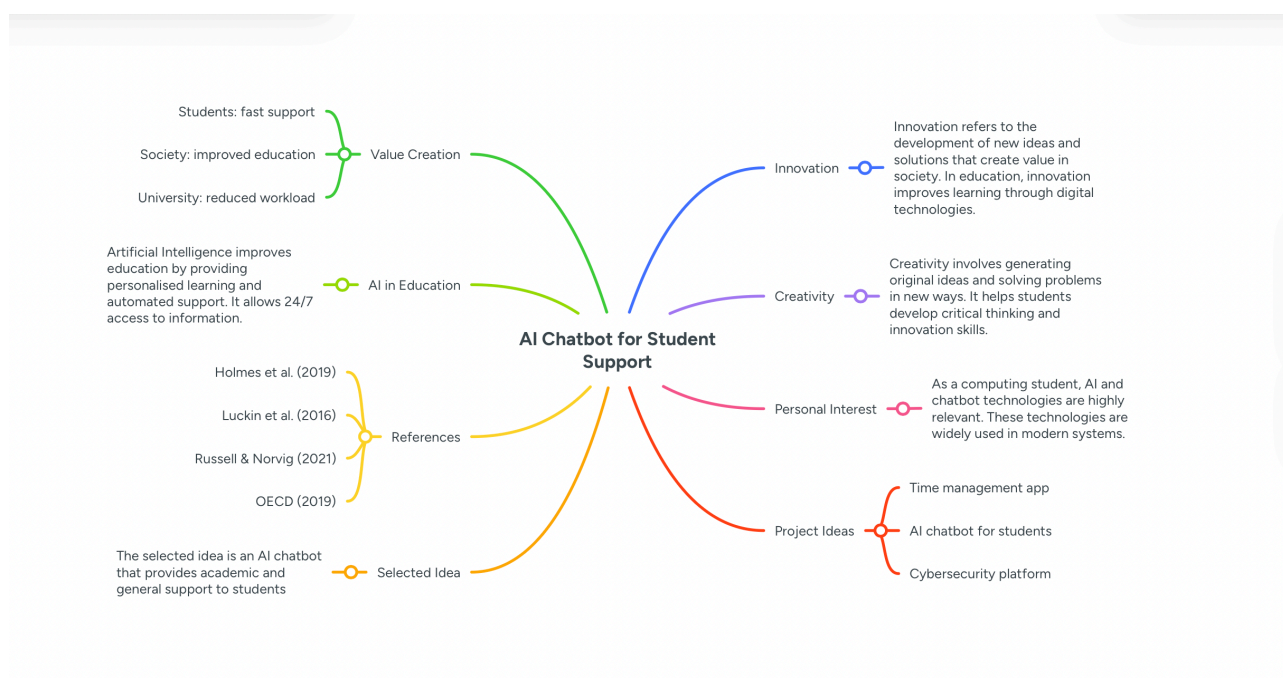
This solution aims to improve the student experience by offering 24/7 assistance, reducing dependency on human support services, and enhancing access to information. Additionally, it reflects current trends in AI adoption within education and aligns with the growing demand for digital support tools.

Value Creation

The proposed chatbot solution creates value in several ways:

- For students: instant access to information and support
- For universities: reduced workload on staff
- For society: improved educational outcomes and digital innovation

By integrating creativity and innovation, this project demonstrates how technology can be used to address real-world problems and contribute to the common good.



Task 2: Aim & Objectives and Research Area

Aim

The aim of this project is to design and develop an AI-powered chatbot that provides academic and general support to university students, improving access to information and enhancing the overall student experience.

Objectives

To achieve the aim, the following objectives are identified:

- To analyse the needs and challenges faced by university students in accessing academic support
- To review existing AI chatbot technologies and their applications within higher education
- To design a user-friendly chatbot interface tailored to student requirements
- To develop a prototype chatbot using appropriate artificial intelligence tools and techniques
- To evaluate the effectiveness of the chatbot in supporting student learning and engagement

These objectives provide a structured framework for achieving the overall aim and ensure that both technical and user-focused aspects of the project are addressed.

Research Philosophy

The research philosophy adopted for this project is pragmatism. Pragmatism focuses on practical solutions and real-world applications rather than relying solely on theoretical approaches. It allows the researcher to use the most appropriate methods to address the research problem.

This philosophy is suitable for the project because the goal is to develop a functional AI chatbot that addresses real student needs. It supports the use of both qualitative and quantitative data to evaluate the effectiveness of the proposed solution. Pragmatic research approaches are commonly used in technology-focused studies to balance theory and application (Creswell & Plano Clark, 2018). In addition, pragmatism allows flexibility in combining different research approaches depending on the problem being studied. This is particularly useful in technology-based projects, where both user experience and system performance need to be evaluated. By adopting a pragmatic approach, the research can focus on producing practical outcomes that are directly applicable to real-world educational settings (Saunders et al., 2019)."

Research Tools and Databases

A range of academic and digital research tools will be used to identify relevant and reliable information:

- Google Scholar – to access academic articles and research papers
- IEEE Xplore – for technical research related to artificial intelligence and computing
- ScienceDirect – for peer-reviewed journals on technology and education
- University library databases – for books and scholarly publications

These sources ensure that the research is based on credible and up-to-date information. Digital libraries and databases are essential for sourcing high-quality AI research (Luckin et al., 2016). These databases were selected because they provide access to high-quality, peer-reviewed research, which is essential for ensuring academic reliability. In addition, they cover both technical and educational perspectives, allowing for a well-rounded understanding of AI chatbot implementation in higher education environments. Using multiple databases also reduces the risk of bias and improves the depth of the literature review.

Search Strategy

Relevant research will be identified using specific keywords and structured search strategies. Examples of keywords include:

- “AI chatbot in education”
- “Artificial intelligence in student support”
- “chatbots in higher education”
- “digital learning technologies”

Boolean operators such as AND and OR will be used to refine searches. For example:

- “AI chatbot AND education”
- “student support OR digital assistant”

Additional filters, including publication date and peer-reviewed status, will be applied to improve the quality and relevance of sources.

Furthermore, search results will be critically evaluated to ensure relevance, credibility, and accuracy. Sources will be assessed based on author expertise, publication quality, and citation frequency. This critical evaluation process helps to ensure that only high-quality and relevant research is included in the study, supporting the overall validity of the project.

Research Approach

This project will adopt a mixed-methods approach, combining both qualitative and quantitative research methods. Quantitative data will be collected through surveys to measure student satisfaction and usage patterns, while qualitative data will be gathered through interviews to gain deeper insights into student experiences. This combination allows for a more comprehensive understanding of the effectiveness of the chatbot system. This approach strengthens the validity and reliability of the research findings. Combining quantitative and qualitative methods enables comprehensive insights into user experience and system performance (Johnson & Onwuegbuzie, 2004).

Task 3: Research Strategies

Strategies to Ensure Validity, Reliability and Generalisability

To ensure the quality of the research, several strategies will be applied.

Validity will be addressed by designing data collection methods that directly relate to the research objectives. Survey questions will be clear, relevant, and focused on student experiences with academic support systems. Ensuring validity in survey design is critical for obtaining reliable student feedback (Bryman, 2016).

Reliability will be ensured by using consistent data collection procedures, such as structured questionnaires. This allows the research to be replicated and produce similar results under the same conditions. Replicable methods increase confidence in research findings and enable comparison across studies (Saunders et al., 2019).

Generalisability will be improved by collecting data from a diverse group of students. This ensures that the findings can be applied to a broader student population rather than a limited sample.

In addition, selecting participants from different academic levels and study programmes will further strengthen the generalisability of the findings. This ensures that the results reflect a wider range of student experiences and are not limited to a specific group (Bryman, 2016).

Ethical Considerations

Ethical principles will be followed throughout the research process:

- Participants will be informed about the purpose of the study
- Informed consent will be obtained before data collection
- Participant data will remain anonymous and confidential
- Data will only be used for academic purposes

These measures ensure that the research is conducted responsibly and in accordance with ethical standards.

Furthermore, ethical approval will be considered where necessary, and all research activities will comply with relevant data protection regulations such as GDPR. Ensuring ethical compliance is essential to maintain trust and integrity throughout the research process. Adhering to GDPR and ethical standards protects participants and enhances research credibility (Information Commissioner's Office, 2018).

Research Strategies and Data Collection Methods

A mixed-methods approach will be used, combining both quantitative and qualitative data collection methods.

Quantitative method:

A structured survey will be distributed to university students to collect numerical data regarding their needs, preferences, and experiences with student support systems.

Qualitative method:

Open-ended survey questions or short interviews will be used to gather more detailed insights into

student opinions and expectations. The combination of quantitative and qualitative methods allows for a more comprehensive understanding of the research problem. While quantitative data provides measurable evidence, qualitative data offers deeper insights into student experiences and perceptions, strengthening the overall findings.

Pilot Data Collection

A pilot study will be conducted with a small group of participants (approximately 3–5 students). The purpose of this pilot is to test the clarity and effectiveness of the data collection method.

Feedback obtained from participants will be used to refine the survey questions, ensuring that they are clear, relevant, and aligned with the research objectives. This pilot phase is important as it helps identify potential issues before the main data collection begins. The pilot phase not only refines data collection tools but also helps anticipate potential challenges in the main study. It improves the reliability and validity of the research by ensuring that the data collection tools are effective and appropriate.

Types of Data Analysis

Both quantitative and qualitative data analysis methods will be applied.

Quantitative analysis will involve:

- Use of percentages and basic statistical analysis
- Presentation of data using charts or graphs
- Identification of trends and patterns

Qualitative analysis will involve:

- Thematic analysis of responses
- Identification of key themes and common ideas
- Interpretation of participant feedback

By combining both forms of analysis, the research will provide both statistical evidence and meaningful interpretations. This strengthens the overall conclusions and supports more informed decision-making regarding the effectiveness of the proposed chatbot solution.

Additionally, data visualisation techniques such as charts and graphs will be used to present the findings in a clear and understandable way. This will help to communicate the results effectively and make it easier to identify key patterns and relationships within the data. Clear presentation of data is important for supporting conclusions and demonstrating the impact of the proposed solution.

Triangulating quantitative and qualitative findings will enhance the credibility of the research conclusions. Triangulation of qualitative and quantitative data strengthens the robustness of conclusions (Denzin, 1978).

Conclusion

This project proposal has outlined the development of an AI-powered chatbot designed to support university students. The project demonstrates how innovation and creativity can be applied within a computing context to address real-world challenges in education.

By identifying a clear aim and structured objectives, the proposal establishes a strong foundation for developing a practical, valuable solution. The selection of a pragmatic research philosophy supports the use of both qualitative and quantitative methods, ensuring a comprehensive approach to evaluating the effectiveness of the proposed system.

Furthermore, appropriate research strategies have been identified to ensure validity, reliability, and ethical integrity. The inclusion of a pilot study and mixed-methods data collection strengthens the overall research design.

Overall, this proposal highlights the potential of artificial intelligence to enhance student support systems and create value for individuals, universities, and society. It provides a solid basis for further development and implementation in future stages of the project.

References

Bryman, A. (2016). *Social Research Methods*. Oxford University Press.

Holmes, W., Bialik, M. and Fadel, C. (2019). *Artificial Intelligence in Education*. Boston: Center for Curriculum Redesign.

Luckin, R., Holmes, W., Griffiths, M. and Forcier, L. (2016). *Intelligence Unleashed: An Argument for AI in Education*. Pearson.

OECD (2019). *Artificial Intelligence in Society*. Paris: OECD Publishing.

Russell, S. and Norvig, P. (2021). *Artificial Intelligence: A Modern Approach*. 4th ed. Pearson.

Saunders, M., Lewis, P. and Thornhill, A. (2019). *Research Methods for Business Students*. 8th ed. Pearson.

Baker, R.S. & Siemens, G. (2014) *Educational Data Mining and Learning Analytics*. Springer.

Creswell, J.W. & Plano Clark, V.L. (2018) *Designing and Conducting Mixed Methods Research*. Sage.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L.B. (2016) *Intelligence Unleashed: An Argument for AI in Education*. Pearson.

Johnson, R.B. & Onwuegbuzie, A.J. (2004) *Mixed Methods Research: A Research Paradigm Whose Time Has Come*. *Educational Researcher*, 33(7), 14–26.

Bryman, A. (2016) *Social Research Methods*. 5th ed. Oxford University Press.

Saunders, M., Lewis, P., & Thornhill, A. (2019) *Research Methods for Business Students*. 8th ed. Pearson.

Information Commissioner's Office (ICO) (2018) *Guide to the General Data Protection Regulation (GDPR)*.

Denzin, N.K. (1978) *The Research Act: A Theoretical Introduction to Sociological Methods*. McGraw-Hill.