

Project Proposal

Module: ACCA5033 – Changemakers: Creativity & Value Creation

Assessment: Component 1 – Project Proposal

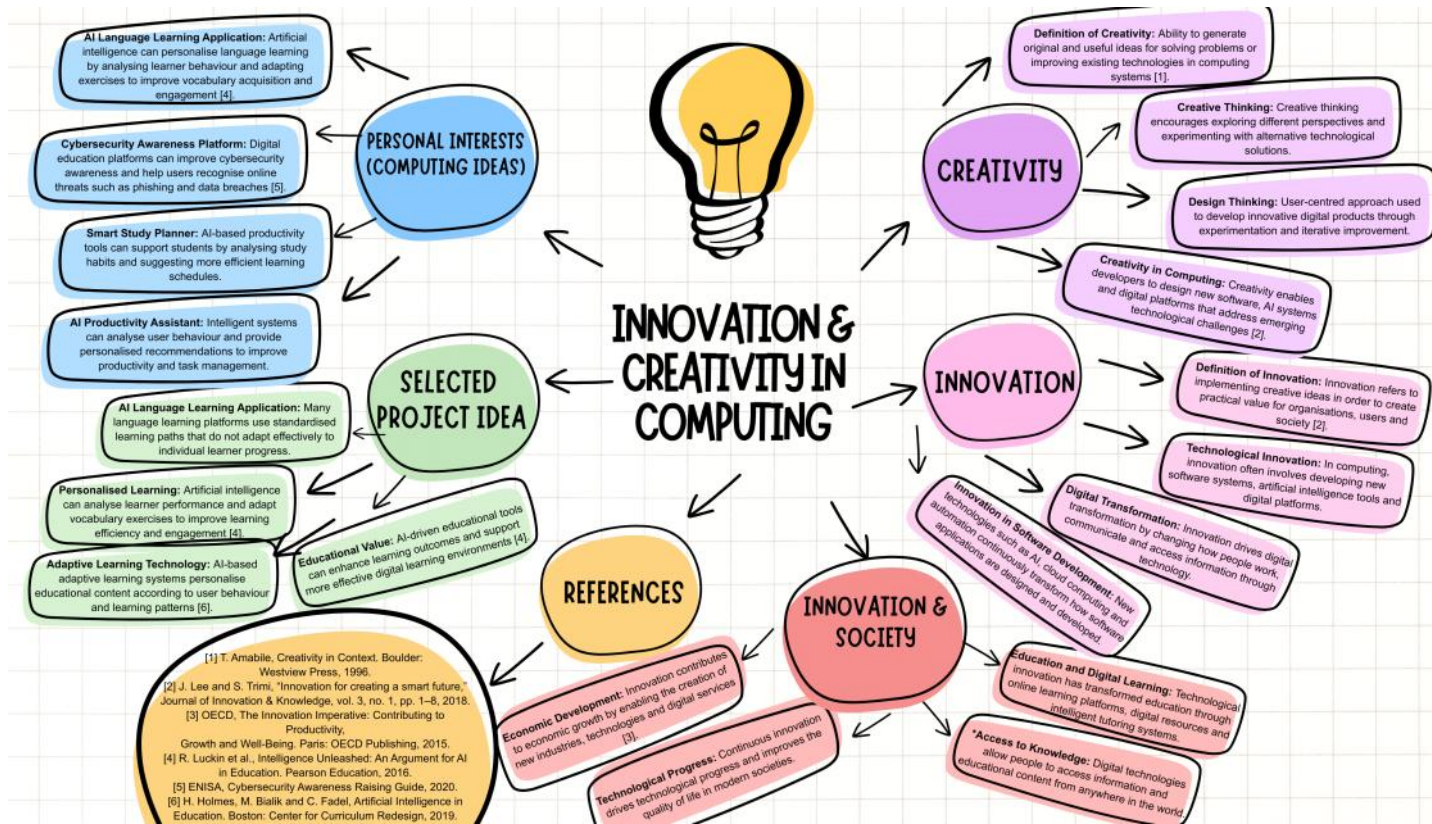
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Task 1– Ideation & Mind Map

This mind map presents ideas associated with creativity and innovation in computing. It explores how these concepts influence technology development and identifies several potential project ideas related to my field of study. Based on this ideation process, the AI language learning application was selected as the project idea for further investigation.



Task 2 – Aim & Objectives and Research Area

Project Aim

The aim of this project is to investigate how artificial intelligence can support the development of a personalised language learning application that adapts vocabulary exercises based on learner performance.

Many current language learning platforms use standardised learning pathways that do not adapt sufficiently to different learners' needs. As a result, users may lose motivation and their learning progress may slow down. AI tools can analyse learner behaviour and personalise learning content and educational resources according to individual needs.

Recent research suggests that AI-based learning systems can improve student engagement and learning outcomes by personalising educational experiences [1]. Therefore, this project investigates how artificial intelligence can be used to design a more adaptive language learning application.

Project Objectives

To achieve the aim of this project, several objectives have been set:

- The first objective is to analyse existing language learning applications in order to understand their current features and identify limitations concerning personalisation and user engagement.
- The second objective is to analyse how AI technologies are being used in digital learning environments, especially in adaptive learning systems and intelligent tutoring systems.
- To develop an AI-based language learning (vocabulary) application and explain its conceptual model based on user performance and learning progress will be the third objective of the study.
- The fourth objective is to collect an early form of user feedback using a pilot data collection method to understand user evaluation of the usefulness and usability of the application.
- Ultimately, the project focuses on exploring the possible benefits and challenges of adopting AI in language learning frameworks.

Research Philosophy

The project's research philosophy is pragmatism. Pragmatism focuses on practical solutions to real-world problems. It allows the researcher to choose research methods that best fit the research question.

The aim of the project is not only to understand how artificial intelligence technologies work, but also how users may experience and interact with an AI-based language learning application. A more complete understanding of both technical systems and user perception can be achieved if useful feedback is collected by considering both user experience and the impact on the learning process.

Pragmatism supports the use of different research approaches, including both qualitative and quantitative data [3]. User behaviour and learning performance can be analysed through quantitative data. At the same time, qualitative feedback can help understand user acceptance and overall experience with the system.

Creswell states that mixed methods research is commonly used within the pragmatic approach in order to better understand complex problems [2]. Because pragmatism focuses on practical solutions, it is considered a suitable research philosophy for a study of a digital learning system that involves both technology and user experience.

Research Tools and Search Strategy

The use of several research databases and search tools is essential for finding relevant research on artificial intelligence and language learning technologies.

One of the main research tools is Google Scholar, which provides access to a wide variety of journal articles, conference papers and research publications. Google Scholar can help identify recent studies investigating the role of artificial intelligence in education [4].

IEEE Xplore, ACM Digital Library, and ScienceDirect are other databases that can be used. These databases contain peer-reviewed publications related to software engineering, computing and educational technologies [5].

Some keywords will be used together with Boolean search operators to identify relevant research. For example:

- AI in education
- AI language learning applications
- Adaptive learning systems
- Intelligent learning systems

Boolean operators such as AND, OR, and NOT are useful for combining these keywords and filtering results in order to identify relevant studies [3].

Using academic databases as part of the search strategy helps ensure that the sources used in the research are reliable and academically credible.

References

- [1] R. Luckin, W. Holmes, M. Griffiths and L. B. Forcier, *Intelligence Unleashed: An Argument for AI in Education*. London: Pearson Education, 2016.
- [2] J. W. Creswell and J. D. Creswell, *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. Thousand Oaks, CA: Sage Publications, 2018.
- [3] A. Booth, D. Sutton and D. Papaioannou, *Systematic Approaches to a Successful Literature Review*. London: Sage Publications, 2016.
- [4] W. Holmes, M. Bialik and C. Fadel, *Artificial Intelligence in Education*. Boston: Center for Curriculum Redesign, 2019.
- [5] M. Saunders, P. Lewis and A. Thornhill, *Research Methods for Business Students*. Harlow: Pearson Education, 2019.

Task 3 – Research Strategies

Research Quality and Ethical Considerations

When doing research, it is important to consider the factors that affect its quality. These include validity, reliability, generalisability and ethics. These concepts are commonly discussed in research methodology and help ensure that the research produces meaningful and trustworthy results [1].

Validity is the extent to which a research method measures what it is intended to measure. For this project, validity could be improved by designing survey questions that have a clear connection to the research objectives and the user experience of AI-based language learning applications. The data collected will better reflect users' actual experience with the proposed system if the questions focus directly on usability, engagement and perceived learning benefits.

Reliability refers to the consistency of the results. The same research should produce similar results when conducted under similar conditions. The reliability of this project can be improved by ensuring that every participant receives the same questionnaire and that the questions are clear for all participants. Providing the same instructions to participants can also reduce differences in responses and improve the reliability of the collected data [2].

Generalisability refers to the extent to which research findings can apply beyond the specific research context. Since this study focuses on a language learning application, it would be useful to collect feedback from users with different levels of language learning experience. By including a variety of participants, the results are more likely to apply to a wider group of users rather than only a small group.

Ethical considerations are also an important part of research. Participants should be informed about the purpose of the study and should voluntarily agree to take part in the research. Users' personal information should remain anonymous and confidential. Participants should also be able to withdraw from the research at any time without negative consequences. Following ethical practices helps ensure that the research is conducted responsibly and that the rights of participants are respected [2].

Data Collection Strategy and Pilot Study

Data will be collected for this project through a survey questionnaire to be used as the main data collection tool. Researchers prefer using surveys in technology and education research because it allows them to obtain feedback from several respondents in a short time [5].

The questionnaire will be designed to focus on user perceptions of AI-based language learning applications. The areas examined may include usability, engagement and perceived effectiveness. There may be a Likert scale where respondents can rate their responses. This scale is widely used in survey research for measuring opinions or attitudes.

Before collecting the actual data, the researcher will conduct a pilot study. A pilot study is a preliminary study which helps identify problems with the questionnaire. For instance, some questions may not make sense or may be interpreted differently by participants. The pilot test helps identify these problems before the full survey is carried out.

Using the feedback from the pilot study will improve the clarity and structure of the questionnaire. The questions designed for the pilot survey together with the feedback received will be placed in the appendix of the project proposal. Selecting a suitable data collection method is an important stage in evaluating the overall quality of the research.

Quantitative and Qualitative Data Analysis

Once you have collected the data, the analysis would depend on the nature of the data collected. In this project, quantitative and qualitative analysis may both be applied in order to gain a fuller understanding of user experience.

Quantitative analysis uses statistics, data and numerical research. Survey responses can be analysed using descriptive techniques like percentages, averages or frequency distribution in this project. These methods can help reveal general tendencies about whether users believe AI-based language learning apps are useful or engaging.

Qualitative analysis looks at non-numeric data, such as what participants wrote. Thematic analysis is a type of qualitative method that identifies common themes in participants' responses. Issues with usability, learning motivation, or user satisfaction may be revealed through participants' feedback [4].

Using both qualitative and quantitative analysis can provide a more complete understanding of how users interact with the proposed AI language learning system. By using both methods, the researcher can examine not only statistical patterns but also gain deeper insight into users' experiences and views.

References

- [1] M. Saunders, P. Lewis and A. Thornhill, Research Methods for Business Students. Harlow: Pearson Education, 2019.
- [2] J. W. Creswell and J. D. Creswell, Research Design: Qualitative, Quantitative and Mixed Methods Approaches. Thousand Oaks, CA: Sage Publications, 2018.
- [3] A. Booth, D. Sutton and D. Papaioannou, Systematic Approaches to a Successful Literature Review. London: Sage Publications, 2016.
- [4] W. Holmes, M. Bialik and C. Fadel, Artificial Intelligence in Education. Boston: Center for Curriculum Redesign, 2019.
- [5] U. Sekaran and R. Bougie, Research Methods for Business: A Skill-Building Approach. Chichester: Wiley, 2016.

Appendix

Appendix A – Pilot Survey Questionnaire

Section 1 – Background Information

1. How often do you use language learning applications?
 - Daily
 - Weekly
 - Occasionally
 - Never
2. Have you used language learning apps before (for example Duolingo, Babbel, etc.)?
 - Yes
 - No
3. What language are you currently learning or interested in learning?
(Open answer)
4. How would you describe your current level in the language you are learning?
 - Beginner
 - Intermediate
 - Advanced

Section 2 – User Experience with Language Learning Apps

1. How useful do you find language learning applications in general?
 - Very useful
 - Useful
 - Neutral
 - Not very useful
2. What features do you usually use the most in language learning apps?
(Open answer)
3. Do you think current language learning apps adapt well to different learners?
 - Yes
 - No
 - Not sure
4. What problems have you experienced when using language learning apps?
(Open answer)

Section 3 – AI-Based Learning Features

1. Have you ever used an AI-based learning tool?
 - Yes
 - No
2. How useful do you think AI could be in personalising language learning?
 - Very useful
 - Useful
 - Neutral
 - Not very useful

3. Would personalised vocabulary exercises help you learn faster?
 - Yes
 - No
 - Not sure
4. How important is it for a learning app to adapt to your progress?
 - Very important
 - Important
 - Neutral
 - Not important

Section 4 – Usability and Expectations

1. How easy do you think an AI-based language learning application would be to use?
 - Very easy
 - Easy
 - Neutral
 - Difficult
2. What features would you expect from an AI language learning application?
(Open answer)
3. Would you be interested in using an AI-powered language learning application?
 - Yes
 - Maybe
 - No

Appendix B – Pilot Feedback

To test the clarity of the questions, the questionnaire was given to a small sample of students. A number of respondents indicated that some questions would be better if simplified and if clearer answer options were added. With the help of this feedback, the questionnaire underwent a few minor changes before the full survey.