Templates

Research Proposal Form

Student name	**Linn Nandar Htun**	Student number	**RE -76205**
Centre name	**GUSTO University**	Date	**18/5/2024 (Sat)**
Tutor	**Mrs. A Mon Oo**		
Unit	**Unit 16 – Computing Research Project**		

Proposed title: **"The Investigation for the enhancement of Self-Study Learning through Big Data Driven AI Chat Bot"**

Section One: Title, objective, responsibilities

Research Title: "The Investigation for the enhancement of Self-Study Learning through Big Data-Driven AI Chat Bot"

Research Question: "What are the effectiveness of GUSTO students' Self-Study Learning through Big Data Driven AI chatbot?"

Research Objectives:

1. To explore the effectiveness of using Big Data in GUSTO university's AI chat bot to enhance self-study practices among GUSTO students
2. To study the impact of GUSTO university's AI chatbot on Self-study experience of GUSTO students
3. To identify potential challenges and directions associated with the usage of Big Data driven AI chatbot for enhancing GUSTO students' self-study aspect

Research Hypothesis: "Utilizing the Big Data Driven AI Chat bot positively influences the self-study habits and enhances the academic performance of GUSTO students."

Section Two: Reasons for choosing this research project

With the constantly evolving of the Big Data driven AI chatbots like OpenAI, Gemini, etc., students get mainly depend on those chatbots to get applicable and valuable information and findings for their questions. This technology advancements can potentially transform education. Also, GUSTO university become large with the expanding programs like IGCSE besides its base programs.

This can lead to limitation of individual attention from lecturers and instructors for explaining or answering questions and giving guidelines to each GUSTO student. In this point, Big data driven AI chatbot can provide educational supports like academic assessments, explaining lectures and supporting resources students needed to do assignments and projects for large number of students simultaneously. Moreover, implementing an AI chatbot that integrate with big data (large data volume associated with GUSTO's program's lectures, Assignment guideline, other educational resources) can assist GUSTO students by offering instant answers and guidance to each student's specific questions without waiting for human instructors' replies. This might perfectly help self-study of GUSTO students where need strong guidelines and instant answers or explanations. This study could reveal ways to offer educational contents to individual students' needs and improve their self-study and overall academic performance as well. Furthermore, this research possibly can identify how Big Data driven AI chatbot can solve students' challenges in doing self-study and assignments.

Section Three: Literature sources searched

Use of key literature sources to support researcher's research question, objective or hypothesis:

Neumann, A.T., Arndt, T., Köbis, L., Meissner, R., Martin, A., de Lange, P., Pengel, N., Klamma, R. and Wollersheim, H.W., 2021. Chatbots as a tool to scale mentoring processes: Individually supporting self-study in higher education. Frontiers in artificial intelligence, 4, p.668220.

Larsson, N. and Eriksson, H., 2023. Chatting Up the Grade: An Exploration on the Impact of ChatGPT on Self-Study Experience in Higher Education.

Kooli, C., 2023. Chatbots in education and research: A critical examination of ethical implications and solutions. Sustainability, 15(7), p.5614.

Chaudhry, I.S., Sarwary, S.A.M., El Refae, G.A. and Chabchoub, H., 2023. Time to revisit existing student's performance evaluation approach in higher education sector in a new era of ChatGPT—a case study. Cogent Education, 10(1), p.2210461.

Slepankova, M., 2021. Possibilities of Artificial Intelligence in Education: An Assessment of the role of AI chatbots as a communication medium in higher education.

Ang, K.L.M., Ge, F.L. and Seng, K.P., 2020. Big educational data & analytics: Survey, architecture and challenges. IEEE access, 8, pp.116392-116414.

Osakwe, J., IYAWA, G., UJAKPA, M.M., AMUNKETE, K. and OBANDE, B.O., 2020, May. Barriers to the Implementation of Big Data Technology in Education: An Empirical Study. In 2020 IST-Africa Conference (IST-Africa) (pp. 1-9). IEEE.

Thakore, A., 2021. AI Solution with Interactive Communication: AI-Enhanced Chat for Big Data in Education (Doctoral dissertation, Colorado Technical University).

Section Four: Activities and timescales

Research Timescales:

Milestone 1: Title Défense
Target date (determined by tutor): 7/5/2024

Milestone 2: Data Collection for Secondary Research report (Literature Review)
Target date (determined by researcher): 17/5/2024

Milestone 3: Write Secondary research report and research proposal
Target date (determined by researcher): 22/5/2024

Milestone 4: Report uploading and Research proposal uploading
Target date (determined by tutor): 31/5/2024

Milestone 5: Primary Research
Target date (determined by researcher): 25/6/2024

Milestone 6: Data collection (Survey)
Target date (determined by tutor): 31/7/2024

Milestone 7: Data Analysis
Target date (determined by tutor): 20/8/2024

Milestone 8: Evaluation of the results
Target date (determined by researcher): 2/9/2024

Milestone 9: Write research paper
Target date (determined by researcher): 21/9/2024

Milestone 10: Tutor meeting
Target date (determined by tutor): 30/9/2024

Milestone 11: Final research uploading
Target date (determined by tutor): 4/10/2024

Section Five: Research approach and methodologies

Research onion model is similar like a layer of onion, including multiple layers which represent different aspects of research. It gives researchers a structured approach to select appropriate methods and approaches for their studies. Likewise, **research onion model** is applied for this research as well.

My research aim to investigate the effectiveness and impact of Big Data driven AI chatbot on GUSTO students' self-study from different perspectives objectively in which studying the effectiveness of Big Data driven AI chatbot on students followed by its benefits, challenges, systems on its own and subjectively in which studying the opinions and feelings of GUSTO students who would use this chatbot. This research also intended to conduct by gathering both numerical data and in-depth insights from students via survey. So, my research doesn't fall into a clear-cut category while it includes investigating both "hard" and "soft" phenomena. (Derek Jansen, 2023). The findings of this research not only theoretically work but also practically applicable (give ideas for educators, policymakers and developers). To draw conclusion, the philosophy layer of this research would be **Pragmatism**.

This research based on the **Deductive** approach. The research has top-down approach that begins with setting a clear hypothesis of utilizing the Big Data Driven AI Chat bot positively influences the self-study habits and enhances the academic performance of GUSTO students. Then, conduct an empirical data

collection and analysis to test this hypothesis and draw conclusion based on the results of analysis.

As mentioned above, structured survey that include both qualitative and quantitative questions will be applied to collect massive data from 80 students. Due to the time constraint and resource constraint, other research strategies such as interview, case study and experiment has limitations to conduct this time even though they give more holistic understanding of effectiveness and impact of Big data driven AI chatbot on GUSTO students' self-study process. In this point survey strategy is the most suitable because one-time create but multiple-time apply to large group of students by distributing it via QR code, i.e., it needs to be created only once but can be used again and again without requiring to recreate it again. For example, if we conduct interview, we need to ask the same interview questions to each 80 students which lead to time-consuming. Survey also allows to ask both qualitative and quantitative questions in one form unlike interview which inconvenience to ask statistical question. So, the strategy of this research would be **Survey**.

In this research, **Mixed-methods** that include both qualitative and quantitative method would be applied which mean both qualitative questions (closed-ended questions like multiple-choice, ranking scales, Likert scales) and quantitative questions (open-ended questions like What do you think, How would you feel, What's your opinion) will be included in the structured survey. To support to fulfil the objectives and get deep understandings needed to test the hypothesis, relying on a mono method wouldn't be sufficient. For example, a question like "On a scale of 1 to 5, how effective do you find the chatbot?" can get statistical data of how much this chatbot influence on student but the deep understanding of why also needed to reveal because this quantitative measure doesn't capture the contextual factors and can involve researcher' bias in contextualize the result which leads to unreliable result. So, an open-ended question like "Can you describe how the chatbot has helped you with your studies?" which can explore the depth of students' personal experience. Through this qualitative result, researcher can get insights into particular features or parts of the chatbot that students mostly find useful or challenges they may encounter and this prevent bias of researcher. To draw conclusion, this mix-method helps the research throughout the data collection and analysis by capturing both the measurable impacts and the personal experiences of each student using this chatbot for their self-study and academic.

This research will be conducted within 10 months (which is almost 1 year) with a limited timeframe which is quicker and resource-intensive. Also, data will be collected from participants at a single point of time and participants will not be tracked over time to chase the changes. By doing so, this research can do a comprehensive analysis of the AI chatbot usage for self-study among GUSTO students without extending timelines with tracking changes and other complexities. Because of this reason, the time horizons of this research would be **Cross-sectional**.

The techniques and procedure of this research would be **data collection** through survey which collect the diverse data points, covering the research objectives and **data analysis** which has two type of analysis, which are statistical analysis of quantitative data and thematic analysis of qualitative data. They give a robust framework for testing the hypothesis.

For Secondary research, literature review will be conducted. When conducting literature review, scholarly articles, conference papers, and other academic publications (on the use of Big Data and AI chatbot in education setting, on their impact on self-study and challenges might face) will be reviewed and written in a summarize report form. These reviews will give researcher a theoretical foundation for her research, point out existing research findings, and help to figure out gaps in the current knowledge base.

This research will cover 3 main areas.

1. How integration of Big Data into GUSTO AI chatbot can effective for self-study practices among GUSTO students
2. The direct impact of this Big Data driven AI chatbot on the self-study experiences and academic performance of GUSTO students (like engagement, accessibility, and effectiveness of study materials provided by the chatbot)
3. Potential challenges and directions associated implementing a Big Data driven AI chatbot within GUSTO university (such as data privacy, ethical considerations, adaption)

Comments and agreement from tutor
Comments (optional): I confirm that the project is not work which has been or will be submitted for another qualification and is appropriate. Agreed: ..... (Name) ..... (Date) .....
Comments and agreement from project proposal checker (if applicable)
Comments (optional): I confirm that the project is appropriate. Agreed: ..... (Name) ..... (Date) .....

Research Ethics Approval Form

All students conducting research activity that involves human participants or the use of data collected from human participants are required to gain ethical approval before commencing their research. Please answer all relevant questions and note that your form may be returned if incomplete.

For further support and guidance please see your respective Unit Tutor.

Before completing this form, we advise that you discuss your proposed research fully with your Unit Tutor. Please complete this form in good time before your research project is due to commence.

Section One: Basic details

Project title: **"The study of enhancing self-study of GUSTO students with Big Data driven AI chatbot"**

Student name: **Linn Nandar Htun**

Student number: **RE - 76205**

Programme: **Unit 16: Computing Research Project**

School: **GUSTO University**

Intended research start date: **10/03/2024**

Intended research end date: **31/12/2024**

Section Two: Project summary

Please select all research methods that you plan to use as part of your project:

- Interviews ☐
- Questionnaires ☐
- Observations ☐
- Use of personal records ☐
- Data analysis ☐
- Action research ☐
- Focus groups ☐
- Other (please specify): .....

Section Three: Participants

Please answer the following questions, giving full details where necessary.

Will your research involve human participants?

Who are the participants?
Tick all that apply:

Children aged 12–16: ☐ Young people aged 17–18: ■ Adults: ■

How will participants be recruited (identified and approached)?

Describe the processes you will use to inform participants about what you are doing:

How will you obtain consent from participants? Will this be written? How will it be made clear to participants that they may withdraw consent to participate at any time?

Studies involving questionnaires:

Will participants be given the option of omitting questions they do not wish to answer?

Yes: ■ No: ☐

If No please explain why below and ensure that you cover any ethical issues arising from this:

Studies involving observation:

Confirm whether participants will be asked for their informed consent to be observed.

Yes : ■ No: ☐

Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study)?

Yes: ■ No: ☐

Will participants be given information about the findings of your study? (This could be a brief summary of your findings in general.)

Yes: ■ No: ☐

Section Four: Data storage and security

Confirm that all personal data will be stored and processed in compliance with the Data Protection Act (1998):

Yes: ■ No: □

Who will have access to the data and personal information?

During the research:

Where will the data be stored?

Will mobile devices (such as USB storage and laptops) be used?

Yes: ■ No: □

If yes, please provide further details:

After the research:

Where will the data be stored?

How long will the data and records be kept for and in what format?

Will data be kept for use by other researchers?

Yes: □ No: ■

If yes, please provide further details:

Section Five: Ethical issues

Are there any particular features of your proposed work which may raise ethical concerns? If so, please outline how you will deal with these:

It is important that you demonstrate your awareness of potential risks that may arise as a result of your research. Please consider/address all issues that may apply. Ethical concerns may include, but are not limited to the following:

- Informed consent.
- Potentially vulnerable participants.
- Sensitive topics.
- Risks to participants and/or researchers.
- Confidentiality/anonymity.
- Disclosures/limits to confidentiality.
- Data storage and security, both during and after the research (including transfer, sharing, encryption, protection).
- Reporting.
- Dissemination and use of your findings.

Section Six: Declaration

I have read, understood and will abide by *[insert centre name]* Research Ethics Policy:

Yes: ☒ No: ☐

I have discussed the ethical issues relating to my research with my Unit Tutor:

Yes: ☒ No: ☐

I confirm that to the best of my knowledge:

The above information is correct and that this is a full description of the ethics issues that may arise in the course of my research.

Name: **Linn Nandar Htun**

Date: **18/05/2024 (Sat)**

Please submit your completed form to: GUSTO GLMS Website