THE ROLE OF ONLINE GROUP DISCUSSION IN ENHANCING THE PERFORMANCE OF UNDERGRADUATE STUDENTS

MUHAMMAD REZAL BIN ABD RAZAK

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

THE ROLE OF ONLINE GROUP DISCUSSION IN ENHANCING THE PERFORMANCE OF UNDERGRADUATE STUDENTS

MUHAMMAD REZAL BIN ABD RAZAK

This report is submitted as part of the requirements for the award of the Bachelor's Degree in Technology Management (Innovation)

Faculty of Technology Management and Technopreneurship
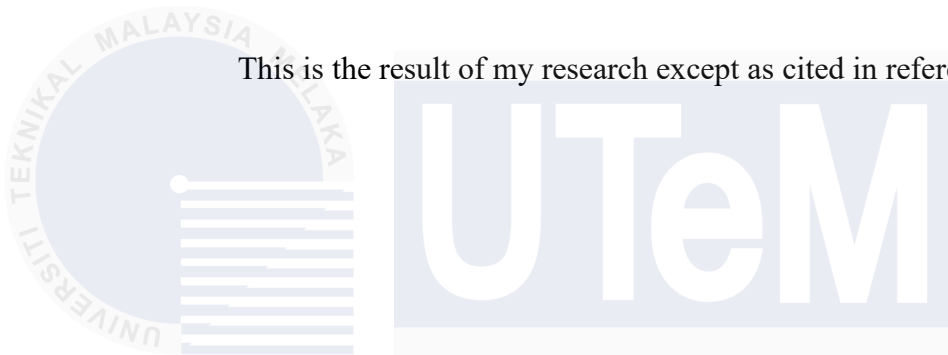
Universiti Teknikal Malaysia Melaka

FEBRUARY 2025

DECLARATION OF ORIGINAL WORK

I hereby declare that this final year project with the title

**"THE ROLE OF ONLINE GROUP DISCUSSION IN
ENHANCING THE PERFORMANCE OF
UNDERGRADUATE STUDENTS"**

This is the result of my research except as cited in references.

SIGNATURE　:

NAME　　　: MUHAMMAD REZAL BIN AD RAZAK

DATE　　　 : 25 January 2025

DEDICATION

To my most beloved relatives and friends,

This final year project marks the culmination of years of dedication and hard work. At this momentous juncture in my academic career, I am overwhelmed with thanks for your constant support and inspiration. Even if I had dissatisfaction and doubts, your faith in me remained unwavering. Your unwavering encouragement encouraged me to pursue greatness, and your tolerance for my late hours and strict deadlines made it all bearable.

I would especially like to express my gratitude to my panelist, Dr. Norun Najjah Binti Ahmat, and my supervisor, Dr. Kamarudin Bin Abu Bakar, whose important advice and mentoring greatly influenced how I approached this project. Your thought-provoking questions and insightful comments helped me improve my ideas and critical thinking abilities, which will surely be useful to me in the future.

ACKNOWLEDGEMENT

Bismillahirrahmanirrahim,

In the name of Allah, The Most Gracious, The Most Merciful. Praise to Allah S.W.T. who blessed me with the strength and dedication to complete this thesis. Peace and prayers be upon His Final Prophet and Messenger Muhammad.

Firstly, I would like to express my sincere appreciation to my supervisor, Dr. Kamaruddin Bin Abu Bakar, for his guidance and encouragement throughout this Bachelor's Project.

Appreciation is also addressed to all those involved who either directly or indirectly helped to make this research project a success. Hopefully, this report will be a reference source for other students in the future.

ABSTRACT

This study explores how online group discussions affect the academic performance of undergraduate students, focusing on their advantages, challenges, and influencing factors. With the increasing use of digital platforms in education, online group discussions have emerged as a flexible and accessible way for students to collaborate and share knowledge. This research investigates their impact by surveying 200 students at Universiti Teknikal Malaysia Melaka (UTeM). The study identifies several benefits of online group discussions, including improved critical thinking, inclusivity, convenience, and deeper learning opportunities. However, it also highlights challenges such as the absence of non-verbal communication, technical issues, information overload, and distractions that may hinder their effectiveness. Factors like platform design, structured facilitation, and participant motivation are also examined as key contributors to successful outcomes. Statistical analysis, including correlation and regression methods, reveals significant relationships between these factors and students' academic performance. The findings show that well-implemented online group discussions can enhance collaborative learning, engagement, and academic achievement, making them a valuable tool for modern education. By addressing the challenges and optimizing the benefits, this study provides practical insights for educators, institutions, and policymakers on how to effectively use online group discussions to improve learning outcomes. It also highlights their potential to complement traditional face-to-face methods and adapt to the evolving needs of education in a digital era.

Keywords: online group discussion, undergraduate students, academic performance, digital learning, collaborative learning, UTeM, critical thinking, engagement.

ABSTRAK

Kajian ini meneroka bagaimana perbincangan kumpulan dalam talian mempengaruhi prestasi akademik pelajar sarjana muda, memberi tumpuan kepada kelebihan, cabaran dan faktor yang mempengaruhi mereka. Dengan peningkatan penggunaan platform digital dalam pendidikan, perbincangan kumpulan dalam talian telah muncul sebagai cara yang fleksibel dan mudah diakses untuk pelajar bekerjasama dan berkongsi pengetahuan. Penyelidikan ini menyiasat kesannya dengan meninjau 200 pelajar di Universiti Teknikal Malaysia Melaka (UTeM). Kajian itu mengenal pasti beberapa faedah perbincangan kumpulan dalam talian, termasuk pemikiran kritis yang lebih baik, keterangkuman, kemudahan dan peluang pembelajaran yang lebih mendalam. Walau bagaimanapun, ia juga menyerlahkan cabaran seperti ketiadaan komunikasi bukan lisan, isu teknikal, lebihan maklumat dan gangguan yang mungkin menghalang keberkesanannya. Faktor seperti reka bentuk platform, kemudahan berstruktur dan motivasi peserta juga diperiksa sebagai penyumbang utama kepada hasil yang berjaya. Analisis statistik, termasuk kaedah korelasi dan regresi, mendedahkan hubungan yang signifikan antara faktor-faktor ini dan prestasi akademik pelajar. Penemuan menunjukkan bahawa perbincangan kumpulan dalam talian yang dilaksanakan dengan baik boleh meningkatkan pembelajaran kolaboratif, penglibatan dan pencapaian akademik, menjadikannya alat yang berharga untuk pendidikan moden. Dengan menangani cabaran dan mengoptimumkan faedah, kajian ini memberikan pandangan praktikal untuk pendidik, institusi dan penggubal dasar tentang cara menggunakan perbincangan kumpulan dalam talian dengan berkesan untuk meningkatkan hasil pembelajaran. Ia juga menonjolkan potensi mereka untuk melengkapkan kaedah bersemuka tradisional dan menyesuaikan diri dengan keperluan pendidikan yang berkembang dalam era digital.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Background of Study

A group discussion evaluates candidates' teamwork and communication skills. A group discussion is a conversation on a certain issue with other applicants, who typically have similar experience and educational qualifications (Puri G. 2018). Performing effectively in a group conversation helps you stand out, and rehearsing for one enhances your public speaking abilities. In this post, we'll go over a group discussion, why it's important in the selection process, what skills are evaluated during a group discussion, and how to do well in this round. The purpose of a group discussion is to get a thorough understanding of a subject under study or an assignment provided (O. Nyumba et al. 2018). Group discussions provide an excellent opportunity for the participants to delve deeply into the subject and gain a thorough understanding of it. It broadens the scope of information and learning. Furthermore, it allows participants to strengthen their critical thinking and analytical skills.

Furthermore, the group discussion is designed to solve a specific problem (O. Nyumba et al. 2018). Because group discussion brings together people with opposing viewpoints, it is also seen as one of the methods used to solve a problem or finish a task that requires group participation. This is critical for university students who have group

projects assigned by teachers. Because people provide different perspectives, group conversations aid in shifting the thought process from a narrow to a broader perspective, paving the path for solutions. Next, group discussion has a role in enhancing communication and interpersonal skills (Tini Mogea . 2020). Group talks help people improve their communication skills by allowing them to articulate ideas, listen actively, and appreciate different points of view. Participants learn how to successfully communicate themselves, structure their views rationally, and persuade others of their opinions. Furthermore, via careful listening, individuals gain empathy and compassion for opposing viewpoints, promoting a culture of open-mindedness and tolerance within the group. This polite discourse promotes productive dialogue, in which issues are handled diplomatically and the consensus is established via reasoned debate. In this dynamic conversation, participants not only share knowledge but also develop important interpersonal skills like efficient communication and respectful involvement, which are useful in both personal and professional settings.

1.2 Online Group Discussion

New millennium learning refers to learning that was impacted by the Fourth Industrial Revolution. So, using an online platform for studying is not uncommon in any educational institution. Online discussion groups can be organized using a variety of software platforms, the most common being Google Meet, Microsoft Team, and Webex. All will perform similar activities, such as posting subjects for discussion, allowing users to post responses, and posing new questions. Some will allow document sharing

and photo uploading, so consider where you want the group to go before choosing a software platform. However, some use mobile applications such as WhatsApp and Telegram, which are applications that have call or video call features. Still, applications such as the following cannot do screen sharing or file sharing (Orly Calderon et al . 2020).

Online group discussions overcome the restrictions of physical space, bringing together people from diverse backgrounds, and encouraging a lively exchange of ideas (Anderson, K . 2019). This diversity of viewpoints can inspire fresh ideas and call into question long-held beliefs. Participants get a deeper comprehension of the issue and improve critical thinking skills by analyzing and evaluating information from multiple perspectives. Furthermore, online debates can empower those who may be too shy or anxious to join in person (Anderson, K . 2019). The asynchronous aspect of Internet communication allows for more considered responses, removing the strain of on-the-spot decision-making. This can result in a more inclusive and participatory learning environment, in which everyone can contribute to and benefit from the group's collective knowledge.

1.3 Student Performance

Enhancing student performance is a multifaceted endeavor that requires a focus on both the learning environment and the students themselves (Mesfin Tadese et al, 2022). In the classroom, engaging activities such as discussions, group projects, real-world applications, and games can foster participation, maintain interest, and solidify concepts. Clear communication is essential, with clear expectations for assignments and projects, using concise language and examples to avoid confusion. Regular, constructive feedback highlighting strengths and weaknesses

allows students to identify areas for improvement and adjust their studying accordingly. Positive reinforcement, through acknowledging and praising good performance and effort, motivates students and creates a positive learning atmosphere. Incorporating cultural awareness by connecting the curriculum to students' backgrounds and experiences personalizes learning and makes it more meaningful.

Supporting students individually involves catering to different learning styles by offering a variety of resources and teaching methods, integrating technology through educational apps and simulations to enhance understanding and engagement, and teaching effective study skills like time management, organization, and note-taking (Hartiwi Prabowo et al, 2022). Positive behavior management with a clear discipline system that focuses on positive reinforcement and redirection is crucial, as is fostering open communication between students, teachers, and parents to address challenges and celebrate successes. Recognizing that every student learns differently, these strategies combined with a supportive learning environment empower students to take charge of their learning and achieve their academic goals.

1.4 Research Questions

1. To what extent do online group discussions impact students' learning effectiveness throughout their undergraduate studies?
2. What are the correlations among different elements of online group discussions, and how do these elements interrelate?
3. Which elements of online group discussions significantly contribute to enhancing student learning effectiveness throughout their undergraduate studies?

1.5 Research Objectives

1. To investigate the extent to which online group discussions impact students' learning effectiveness throughout their undergraduate studies.
2. To understand their interrelationships, analyze the correlations among different elements of online group discussions.
3. To determine the dominant elements of online group discussions that significantly contribute to enhancing student learning effectiveness throughout their undergraduate studies

1.6 Problem Statement

Although undergraduate education traditionally relied on lectures to transmit knowledge, it frequently fails to provide opportunities for active student interaction and critical thinking growth. This emphasis on passive learning can result in rote memorization and a gap between the theoretical knowledge offered and its practical application. A recent study by Samar Mohammed Alharbi et al. (2020) highlights this worry, implying that online collaborative learning, which can include online debate, can bridge this gap. Their findings imply that such a collaborative atmosphere can improve critical thinking abilities and student involvement, potentially leading to a better knowledge of the topic.

However, the online learning environment has distinct obstacles. Students in online classes may feel more isolated and have fewer opportunities for the types of peer relationships that are beneficial for learning. Bansal, R et al. (2023) systematic review emphasizes the importance of measures to promote student engagement in online settings.

Although online talks may provide a solution, further research is needed to determine how to successfully use them to overcome the limits of online learning and maximize student performance throughout their undergraduate degrees.

Therefore, there is a significant need to investigate the function of online group discussions in increasing student performance throughout their undergraduate education. Can online conversation overcome the limits of traditional lecture-based learning by encouraging deeper comprehension, critical thinking abilities, and community spirit? Finally, online discussions improve academic performance and better prepare students for the demands of the workplace.

A quantitative study at Universiti Teknikal Malaysia Melaka (UTeM) looked into how online group discussions affected undergraduate students' academic achievement. The study's goal is to improve understanding of the effectiveness of various teaching strategies in online learning environments by assessing participation in online group discussions and academic outcomes. This study uses survey and data analysis approaches, including correlation and regression analysis, to elucidate the relationship between online group discussion activity and academic accomplishment. The findings of this study can inform educational strategies and practices, particularly in the context of distant learning needed, and provide useful insights for optimizing student learning experiences in online contexts.

1.7 Research Significance

Improving the quality of undergraduate education, particularly in online settings, is crucial for preparing students for the challenges of a

quickly changing world. This research on the role of online group conversations is significant for various reasons:

1. Improved Learning Outcomes. Traditional lecture-based learning can result in rote memorization and detachment from real-world applications. This study seeks to discover whether online group conversations may bridge this gap by encouraging deeper comprehension, critical thinking abilities, and a more engaged learning experience, ultimately leading to greater academic performance.

2. Limited peer connection in online learning contexts might lead to decreased student engagement. This study investigates how online group discussions might foster a sense of community and belonging, thereby enhancing student engagement and motivation, which are critical for success in online courses.

3. Research on the impact of discussion qualities on student engagement and learning outcomes can help lectures optimize online discussions for maximum effectiveness.

4. Teacher and Student Perspectives: Understanding the perceived benefits and limitations of online group discussions from both student and teacher perspectives will help to build best practices for implementing and facilitating them in undergraduate courses.

The findings of this study can be applied to improve the design and implementation of online courses, resulting in a more engaging and successful learning experience for undergraduate students. Furthermore, by encouraging deeper comprehension, critical thinking skills, and a sense of community, online group conversations can help students succeed in their academic pursuits and future jobs.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Online group discussions are becoming more common in higher education settings, allowing students to engage in collaborative learning outside traditional classrooms. This research review seeks to investigate the function of online group discussions in improving student performance during their undergraduate studies. By synthesizing current data, this study will shed light on the benefits, obstacles, and best practices of incorporating online group discussions into undergraduate education.

The introduction establishes the context for understanding the importance of online group discussions in undergraduate education and defines the objective of this literature evaluation. In today's digital age, internet communication tools have revolutionized the educational environment, opening up new collaboration, connection, and learning options. Online group discussions, particularly in higher education, where students frequently come from diverse backgrounds and have different learning styles, provide a strong means of engaging learners outside the limits of traditional face-to-face instruction (Harasim, 2020). Educators may use digital platforms to design dynamic learning environments that encourage active involvement, critical thinking, and peer interaction.

Students face various hurdles throughout undergraduate studies, including understanding complicated topics, mastering course materials, and preparing for exams. Online group discussions can help solve these issues by enabling students to exchange viewpoints, ask questions, and

explore ideas. Students who engage in discourse with peers not only solidify their grasp of course materials but also build important communication skills and collaborative competencies that are highly valued in today's linked society (Hew & Cheung, 2019).

This literature review aims to delve into existing research to investigate how online group conversations contribute to improved student performance during undergraduate studies. This review seeks to shed light on the various benefits, obstacles, and best practices involved with implementing online group discussions into undergraduate education by synthesizing empirical evidence and scholarly ideas. We hope to give educators, academics, and policymakers useful insights and practical ideas for using online group discussions to boost student learning and academic performance. Finally, the purpose of this review is to contribute to the continuing discussion about effective pedagogical practices in higher education, as well as to inform future research and practice in this area.

2.2 Role of Online Group Discussion

The digital era has brought about a fundamental shift in communication and knowledge sharing. We no longer live in a physically constrained world, but rather in a hyper-connected one where information travels freely across borders and time zones. At the vanguard of this transition is the potent tool of online group discussions (Koksal Buyuk, 2023). These virtual venues overcome geographical limits and temporal barriers, promoting lively communities and knowledge sharing among geographically dispersed individuals.

Online group discussions take numerous forms and blend effortlessly into the fabric of our digital lives. Social media platforms include forums and message boards where users can discuss everything

from celebrity gossip to astronomy. The online course uses video conferencing software to provide a dynamic learning environment in which students worldwide can participate in real-time collaborative discussions and debates. Even niche communities can find their voice through specific online platforms, which build connections and a sense of belonging among people who share common interests, independent of their physical location. The extent of Internet group conversations greatly exceeds informal communication.

It can serve as a springboard for in-depth investigation of complicated subjects, questioning assumptions, and encouraging critical thinking (Semiyu Adejare, 2021). The researcher will look at the elements that determine the effectiveness of these discussions, to understand how to maximize the potential of online group discussions in an interconnected world that values communication, learning, and collaborative problem-solving. The researcher will also investigate the issues that arise while employing the online group discussion method with undergraduate students. Next, the researcher will investigate the elements determining the success of using online group discussions as a study tool in this era.

2.2.1 Benefits of Online Group Discussion

2.2.1.1 Increased Participation and Richer Perspectives

Online group discussions have transformed the way we connect and interact with people. Unlike traditional face-to-face discussions, which are restricted by geography and scheduling, online group

discussions bypass geographical and time limits (Levy, 2019). Consider a student in a remote hamlet participating in a passionate debate about a current subject or a problem that must be resolved with numerous others without interruption. This eliminates physical barriers and creates a more inclusive atmosphere. Individuals from varied backgrounds and regions can collaborate digitally, bringing diverse experiences and viewpoints. This inclusion is an important feature of online group discussions, as individuals share insights molded by their cultural, social, and professional settings. Consider a business plan debate in which an entrepreneur from a developing country shares their perspective with a senior executive from a global corporation. This interchange of differing perspectives results in a more comprehensive grasp of the themes covered and stimulates inventive solutions. Research shows that exposure to a broader range of opinions can increase critical thinking skills and lead to more creative problem solutions.

2.2.1.2 Convenience

For undergraduate students, online chats can considerably improve their learning experience. Consider a busy college student working part-time, participating in extracurricular activities, and completing coursework (Schneider, 2022). In a traditional onsite classroom situation, this student frequently rushes to class after a long day at work, exhausted and stressed from the journey. When people arrive, it takes some time for them to relax, settle in, and turn their attention to the lesson material. In contrast, in an online class with asynchronous discussions, students can join whenever it is most convenient for them. Rather than rushing to a real classroom after work, people can participate in conversations from the comfort of their own homes, during a break

between classes, or whenever they are most attentive and engaged. This alleviates commuting stress and helps students enter the conversation with a clear mind, ready to grasp the course material. Furthermore, the flexibility to participate in online discussions at their own pace allows students to devote adequate time to thoroughly comprehending the themes under debate. They can reread lesson materials, look up additional resources, and write insightful responses without feeling rushed or pressured by the limitations of a traditional classroom setting. Overall, the convenience of online conversations allows undergraduate students to maximize their learning experience by engaging more thoroughly with course material and contributing effectively to debates, regardless of their hectic schedules or other responsibilities.

2.2.1.3 Fostering Active Voice Exchange

The vocal tapestry of inclusion generated by online group discussion results in a more active exchange of viewpoints during the conversation (Gasmi, 2022). Participants contribute a distinct voice from their cultural background, social experiences, and professional expertise. Cultural viewpoints can impact learning methods, and social experiences can form educational requirements. Participants can gain a more comprehensive grasp of the subject by acknowledging and discussing the many points of view. Furthermore, the asynchronous nature of online group discussions allows for careful consideration before contributing. This encourages the formation of reasoned arguments and intelligent counterpoints, resulting in a more interesting and intellectually rich debate experience.

2.2.1.4 More Introvert Student Participation

The nature of online discussions can provide an edge to introverted students, allowing them to thrive in ways that may not be possible in traditional face-to-face environments (Ngendahayo, 2019). Let's take an example. Consider an undergraduate student who identifies as introverted. In a regular face-to-face classroom context, this student frequently struggles to participate in conversations fully. The fast-paced nature of in-person conversations and the pressure to think and reply quickly can make people feel overwhelmed and unwilling to express their ideas. As a result, they may frequently remain mute or struggle to add something to the discourse. However, in an online discussion forum, this student finds a place where they may completely interact and express themselves at their own pace. Because of the asynchronous nature of online debates, people can carefully consider comments, create intelligent responses, and participate in the conversation without feeling rushed or dominated by more vocal peers. Unlike in-person conversations, when extroverted people may dominate the conversation, online platforms can level the playing field. Extroverted students who thrive in verbal communication may find themselves in the spotlight alongside their introverted classmates, whose views and perspectives are given equal weight and consideration online. As a result, the introverted student feels more empowered to actively participate in online debates, drawing on their introspective inclination to make significant remarks and engage in meaningful dialogue with their classmates. The online setting allows them to demonstrate their skills as an introverted learner, eventually improving their academic experience and promoting a deeper knowledge of course material.

2.2.2 Disadvantages of Online Group Discussion

2.2.2.1 Lack of Non-Verbal Cues

One of the main disadvantages of online group discussions is the lack of nonverbal cues. In face-to-face communication, a raised brow, a knowing smile, or a frustrated sigh can transmit far more information than the spoken word (Clark T, 2020). These nonverbal clues aid in determining the emotional undercurrents of a conversation, interpreting the intended meaning of words and establishing relationships with individuals. Unfortunately, the text-based nature of online group discussions eliminates this depth of communication, allowing the possibility for misunderstandings and misinterpretations of tone. Consider an undergraduate student participating in an online discussion forum about a complicated philosophical issue. They diligently prepare a smart response, carefully considering each argument. However, their statement concludes with a plain period. Without the nonverbal cue of a grin or raised eyebrow indicating that they are receptive to further discussion, another student may view the period as dismissive or even unfriendly. This misunderstanding could cause a breakdown in the conversation, limiting the learning potential of the online group discussion. The absence of nonverbal cues can also foster a sense of anonymity and detachment in online discussions. Without the ability to see other participants' faces and body language, it might be difficult to establish rapport or evaluate the group's general emotions. This can be especially difficult for undergraduate students who are still learning how to communicate online and may feel less comfortable expressing themselves freely in the absence of the social cues found in face-to-face conversations.

2.2.2.2 Information Overload and Disinformation

Online chats can be both beneficial and perplexing to undergraduate students. Consider a student taking a psychology course online (Maeya Flayella, 2022). They participate in talks to get additional knowledge about mental health issues. But as they read through the many posts, they begin to feel overwhelmed. There is so much information that it's difficult to determine what is accurate and what is not. They occasionally come across posts that appear to be fascinating but lack supporting evidence. People begin to distrust everything they read without knowing how to determine whether anything is reliable. They decide to use everything they've learned in classrooms to make sense of it all. They browse for material from trustworthy sources and seek guidance from their classmates. They gradually improve their ability to determine what is and is not trustworthy. They gain confidence in navigating the internet world as they develop their critical thinking skills. They understand how to question what they read and seek credible information. This enables students to learn more effectively and engage in more informed discussions with their classmates.

2.2.2.3 Technical Challenges and Participation Asymmetry

Undergraduate students may find it challenging to participate in online group discussions due to technical issues and asymmetries. Consider a student in an online class. They are eager to engage in online discussions about the topics they are learning (Tiene, 2019). However, they encountered a stumbling obstacle when their internet connection failed repeatedly. While they struggle to stay connected, their classmates with faster internet and newer devices have no trouble participating. As the discussion proceeds, students feel excluded and find it difficult to

participate. With no fixed speaking instructions, some pupils talk a lot, leaving little room for others to offer their ideas. Ultimately, the student misses out on fully engaging in the discussion due to technical issues and unequal participation. This shows how important it is to help students with technical difficulties and ensure that everyone gets a chance to contribute to online group discussions.

2.2.2.4 Distractions

One key problem related to online conversations is the prevalence of distractions, which can impair students' ability to focus and actively participate in the discussion (Northover, 2020). Unlike face-to-face interactions in a controlled classroom setting, online discussions are frequently held in students' homes or workplaces, where countless potential distractions abound. During online talks, students are distracted by a variety of things, including household chores and family obligations, as well as work-related tasks and digital notifications. The ease of participating in discussions remotely may also foster a false sense of complacency, making it easier for students to succumb to the temptation of multitasking. With the temptation of social media, email, and other online platforms just a click away, students may find themselves diverting their focus from the debate at hand to other pursuits, limiting their capacity to actively contribute and extract valuable insights from the discourse. Furthermore, the absence of physical presence and direct accountability in online discussions may compound the problem, as students may feel less compelled to retain focus and actively participate without immediate supervision from their instructor or classmates. As a result, instructors must be aware of these issues and employ techniques to reduce distractions, such as setting explicit participation expectations,

introducing interactive components into discussion formats, and providing advice on time management and digital etiquette. By addressing distractions proactively, educators can create a conducive online learning environment that promotes focused engagement and meaningful interaction among students.

2.2.3 Factors Influencing the Effectiveness of Online Group Discussion

2.2.3.1 Platform Design and Functionality

Platform design and functionality are critical for students participating in online group discussions, especially in biology classes (Kedia P et al, 2022). A user-friendly design is essential, allowing students to easily browse the platform, locate conversation topics, and interact with their classmates without feeling overwhelmed. Threaded answers are extremely useful because they allow participants to respond directly to specific comments or threads within discussions, helping to keep debates organized and coherent. Clear formatting options, such as text formatting and multimedia embedding, allow students to successfully express themselves while improving the readability of discussions for all participants. Furthermore, features such as surveys, file sharing, and real-time chat promote interactivity and engagement, allowing students to swiftly collect feedback, effortlessly trade resources, and engage in spontaneous conversations with their classmates. Overall, a well-designed platform with intuitive interfaces and robust functionality

improves students' online group discussion experiences, allowing for smoother communication, better information organization, and a more enjoyable learning journey in online courses.

2.2.3.2 Ground Rules and Moderation

Setting ground rules and good moderation are critical components of successful online group conversations. These behaviors foster courteous communication and responsible involvement, laying the groundwork for a good and productive discussion environment (Razali et al, 2020). Ground rules offer participants explicit parameters that outline expectations for behavior, communication norms, and the sharing of varied ideas. By establishing these norms up front, moderators foster a sense of accountability and mutual respect among participants. Moderation is essential for enforcing these ground rules and dealing with any disruptive behavior that arises during talks. Moderators actively monitor the debate and intervene when needed to redirect the discussion back to the issue at hand or to handle instances of disrespectful or inappropriate behavior. Moderators contribute to a pleasant and inclusive online environment in which all participants feel respected and heard by remaining proactive and responding to concerns as they emerge. Moderators can also promote diversity by ensuring that all voices have an opportunity to contribute and encouraging balanced involvement from participants. Moderators use these strategies to shape the general dynamics of online group discussions, enabling meaningful interaction and instilling a feeling of community in members.

2.2.3.3 Clear Goals and Structured Facilitation

Defining clear goals and objectives for online group conversations is critical to their success, giving participants a feeling of direction and purpose. These objectives serve as a road map for the debate, directing participants toward meaningful outcomes and ensuring that their contributions are consistent with the overall aims (Beena Vijayavalsalan, 2018). Facilitators build a shared understanding among participants by explicitly stating the discussion's aims upfront, encouraging engagement and focus throughout the talk. Structured facilitation is another important factor that adds to the success of online group discussions. A professional facilitator guides the talk, keeping it focused and fruitful. They facilitate debate by asking thought-provoking questions, encouraging deeper study of ideas, and summarising essential aspects to enhance knowledge. Facilitators help sustain momentum and keep the debate on track to achieve its goals. Structured facilitation also guarantees that all participants have the opportunity to contribute and have their views heard, which promotes inclusion and fosters a collaborative learning atmosphere. Overall, clear goals and systematic facilitation are critical components of effective online group conversations, ensuring that they are purposeful, engaging, and productive. Facilitators empower participants by identifying clear objectives and offering organized guidance, allowing them to actively participate, exchange ideas, and work towards common goals.

2.2.3.4 Participant Motivation and Prior Knowledge

Participant motivation and prior knowledge are important elements in determining the efficiency of online group discussions. Participants' levels of motivation have a direct impact on their engagement and contributions to the debate. Engaged participants are enthused about the issue and actively participate (Lei Mao et al, 2024). They provide well-reasoned arguments, share useful insights, and ask thought-provoking questions. Their active participation encourages a dynamic flow of ideas and a deeper examination of the subject, resulting in more productive and meaningful debates. Furthermore, participants' prior understanding of the topic influences the depth and complexity of the discussion. Having a basic familiarity with the subject allows participants to contribute more effectively to the conversation by building on one another's thoughts and observations. Participants with prior expertise can add vital background, share relevant resources, and offer nuanced opinions, enriching the debate and improving the overall learning experience for all attendees. Furthermore, their familiarity with the subject enables for more in-depth investigation of complicated concepts, as well as more meaningful interaction with the content. Finally, participant motivation and prior knowledge are critical aspects that influence the success of online group assignments. Engaged individuals who bring a high level of motivation and prior knowledge to the debate are more likely to make important contributions, resulting in more fruitful exchanges and deeper learning. Facilitators can boost participant motivation by creating a supportive and inclusive discussion environment and allowing participants to contribute their prior knowledge and experience to deepen the debate.

**2.3 Enhancing Student Performance Through Online Group
   Discussion**

Online group discussions have become a vital part of modern
education, providing numerous advantages over traditional classroom
settings (Stansfield et al, 2019). They not only encourage peer contact, but
they also foster critical thinking, problem-solving abilities, and
cooperative learning. Students who participate in these debates improve
not just their comprehension of the subject, but also their communication
skills and digital literacy. Furthermore, online group conversations allow
students to examine different points of view, establishing an inclusive and
empathy-filled environment. Students can widen their outlook and
increase their learning experiences by engaging in respectful debate and
active engagement in discussions about other cultural, social, and
ideological perspectives. Participation in online group conversations is
linked to improved academic performance, according to research.
Students can strengthen their understanding of course material, clarify
misconceptions, and deepen their comprehension by actively participating
in collaborative learning activities that include peer feedback and
discussion. Furthermore, the collaborative aspect of online group
discussions promotes accountability and incentive as students work
together to achieve common academic objectives (Zhao Du, 2022).
Furthermore, online group conversations facilitate personalized learning
and self-directed inquiry. Students can investigate topics of interest, share
resources, and work together on projects, promoting autonomy and
ownership of their learning experience. Educators can use technology to
build dynamic learning environments that respond to today's students'
different demands and learning styles. Given these findings, it is clear that
online group conversations have a significant impact on student
performance and academic success. Educators may enable students to
become active participants in their learning process by using the power of

digital collaboration, providing them with the skills and competencies required to survive in an increasingly interconnected and knowledge-driven world.

2.3.1 Benefits of Online Group Discussion for Student Performance

2.3.1.1 Enhanced Knowledge Construction and Critical Thinking

Online group discussions are rapidly being recognized for their importance in helping students improve their knowledge construction and critical thinking skills. Numerous studies have demonstrated the beneficial effects of online group discussions in this area (Anderson K, 2020). One of the primary benefits of online group discussions is their asynchronous nature, allowing students to engage with course material and connect with classmates at their own pace. This adaptability not only accommodates different learning styles but also allows for more in-depth evaluation and analysis. Unlike traditional classroom discussions, which are sometimes time-limited, online group discussions allow students to thoroughly investigate subjects, synthesize material, and make intelligent responses. Furthermore, the online environment promotes intellectual freedom, enabling students to express themselves openly and engage in productive dialogue.

An important feature of online group discussions is their capacity to expose students to a variety of opinions and viewpoints. Interactions with peers from varied origins and cultures teach students to critically analyze material, question assumptions, and explore alternate points of view. This cognitive dissonance process not only improves their grasp of the issue

but also helps them develop critical thinking skills. Students learn to analyze complicated issues, examine evidence, and communicate well-reasoned arguments through reasoned speech and healthy debate in an online discussion forum. Furthermore, the collaborative nature of online group discussions encourages students to actively participate in knowledge co-construction, which involves refining and synthesizing ideas together. As a result, online group discussions are effective venues for developing intellectual growth, promoting higher-order thinking skills, and helping students handle the complexities of today's world.

In addition to promoting knowledge production and critical thinking, online group discussions provide students with a unique opportunity to improve their digital literacy abilities. As discussions take place in virtual spaces, students must traverse online platforms, use digital tools, and communicate effectively through written text. These digital literacy abilities are becoming increasingly important in today's digital world, as information is mostly accessed and distributed via internet means. Students who actively participate in online group discussions not only improve their ability to critically analyze online resources but also learn how to speak eloquently in a digital format. Thus, online group discussions not only promote academic improvement but also provide students with the vital skills required to flourish in an increasingly digitalized society.

2.3.1.2 Improved Communication and Collaboration Skills

Online group discussions provide great opportunities for students to polish critical communication and teamwork skills required for success in both academic and professional settings. One of the primary benefits of online group discussions is the possibility for students to improve their

communication skills (Janelle Jones, 2021). Students improve their written communication skills by practicing constructing clear, coherent, and concise arguments. Unlike verbal communication, which may be limited by time restrictions and the demand for quick reaction, the asynchronous nature of online group discussion allows students to carefully craft their thoughts, developing precision and clarity in their statements.

Furthermore, online group discussions promote the development of teamwork and collaboration abilities in pupils. As participants engage in online forums, they have the opportunity to cooperate with peers, exchange insights, and jointly investigate challenging themes. Collaborative learning experiences in online group discussions empower students to combine their knowledge, viewpoints, and expertise, generating a sense of shared ownership and responsibility for the learning process. Working together to achieve common goals helps students develop important interpersonal skills like active listening, empathy, and conflict resolution, all of which are required for effective collaboration in both academic and professional environments.

In addition, the diversity of online interactions within online group discussions exposes students to a variety of communication methods and cultural viewpoints (Semiyu Adejare, 2020). Engaging with peers from various origins promotes a sense of diversity and improves students' capacity to communicate effectively across cultural and linguistic boundaries. Students learn cross-cultural communication skills through respectful dialogue and idea-sharing, which are crucial for managing an interconnected global society. In essence, online group discussions act as incubators for the development of communication and collaboration abilities required for success in the digital age.

2.3.1.3 Increased Engagement and Motivation

Online group discussions have received attention for their capacity to increase student involvement and motivation while avoiding the passive aspect commonly associated with traditional lecture-based methods (Hanadi Hamadi et al, 2023). According to research, the interactive element of online group discussions encourages students to participate more actively. Unlike traditional lectures, where students may passively receive knowledge, online group discussions allow students to take control of their learning experience. Students who participate in online forums are urged to actively seek clarification, share their thoughts, and add their viewpoints to the topic. This active participation instills a sense of agency and autonomy in students, encouraging them to become more involved in their academic pursuits.

Furthermore, online group discussions enable personalized learning experiences based on individual interests and learning styles. Because online discussions are asynchronous, students can work through course content at their own pace, catering to a wide range of learning needs and preferences. This flexibility promotes not only self-directed inquiry but also a sense of responsibility for one's learning. Educators can spark curiosity and drive intrinsic motivation by allowing students to investigate issues of personal interest and relevance through online forums, resulting in a more positive and meaningful learning experience.

Additionally, the collaborative nature of online group discussions fosters a sense of community and camaraderie among students, which increases engagement and motivation(Hanadi Hamadi et al, 2023). As participants work on group projects, participate in peer review activities, and provide feedback to their peers, they gain a sense of belonging and connection to their learning community. This sense of social presence and support can encourage students to actively participate in online discussions, knowing that their contributions will be acknowledged and

respected by both their peers and teachers. In essence, online group discussions provide a dynamic and engaging learning environment that promotes enhanced engagement, motivation, and a stronger sense of connection to the learning experience.

2.3.1.4 Enhancing Research and Information Literacy Skills

Online group discussions are a great way to develop students' research and information literacy skills. Online group conversations are famous for their intrinsic emphasis on in-depth topic exploration and the sharing of relevant sources to facilitate debates (Aljeraisy et al, 2029). This interactive approach enables students to actively engage with course material while simultaneously necessitating the collection and evaluation of reputable sources. As students research to give evidence and support for their ideas in the online discussion forum, they are challenged to critically evaluate the credibility, validity, and relevance of diverse sources. This discernment process helps students build information literacy abilities by allowing them to distinguish between trustworthy and untrustworthy sources, detect biases, and separate fact from opinion.

Furthermore, online group discussions help students synthesize knowledge and present their findings clearly and straightforwardly. Through peer exchanges, students learn to distill complex ideas, extract crucial concepts, and explain their thoughts coherently within the confines of written communication. Furthermore, the collaborative nature of online group discussions promotes peer feedback and constructive criticism, allowing for iterative improvement in students' research and presentation skills. As students participate in discussions, they improve their ability to articulate ideas persuasively, support arguments with evidence, and engage in reasoned debate.

Additionally, online group discussions promote active learning experiences that extend beyond the confines of the classroom. By encouraging students to explore diverse perspectives, engage in independent inquiry, and share their findings with their peers, online group discussions foster a culture of lifelong learning and intellectual curiosity. Through this process, students develop the skills and competencies necessary to navigate the vast sea of information available in today's digital age, empowering them to become discerning consumers and creators of knowledge. In essence, online group discussions serve as catalysts for enhancing research and information literacy skills, equipping students with the tools and resources needed to thrive in an information-rich society.

2.3.1.5 Promoting Peer Learning and Mentorship

Online group discussions provide an ideal environment for developing peer learning and mentorship, broadening the educational experience beyond typical classroom limits. One of the distinguishing qualities of online group discussions is their capacity to foster a collaborative learning environment in which students of various levels of experience may share knowledge and insights. In this dynamic atmosphere, students with a stronger understanding of a specific topic might function as mentors or facilitators, helping their classmates through challenging topics, answering questions, and providing clarifications. This peer-to-peer interaction not only reinforces the mentor's knowledge of the subject but also provides excellent learning opportunities for the mentees (Yu Mei Wang, 2019).

Furthermore, the peer-learning dynamic of online group discussions fosters a sense of community and camaraderie among students. As

participants engage in meaningful discourse, share resources, and work together on tasks, they gain mutual respect and appreciation for one another's contributions. This sense of belonging creates a supportive learning atmosphere in which students feel empowered to actively participate and seek help from their peers without fear of being judged. Furthermore, peer learning encourages students to take control of their learning experience, instilling a sense of responsibility and accountability for academic success.

Additionally, online group discussions allow students to gain from a variety of perspectives and experiences. Students learn about diverse perspectives and problem-solving approaches by interacting with classmates from various origins, cultures, and academic specialties. This exposure not only broadens their knowledge of the subject, but also encourages creativity, originality, and critical thinking. Through collaborative exploration and peer evaluation, students learn to value diversity and use it to foster collective learning and progress.

2.4 Theoretical Framework

The theoretical framework is defined as a structure that directs research by depending on a formal theory that was developed using an established, coherent explanation of specific events and relationships (Grant & Osanloo, 2014). In this study, the framework depicts the independent and dependent variables that will be investigated.
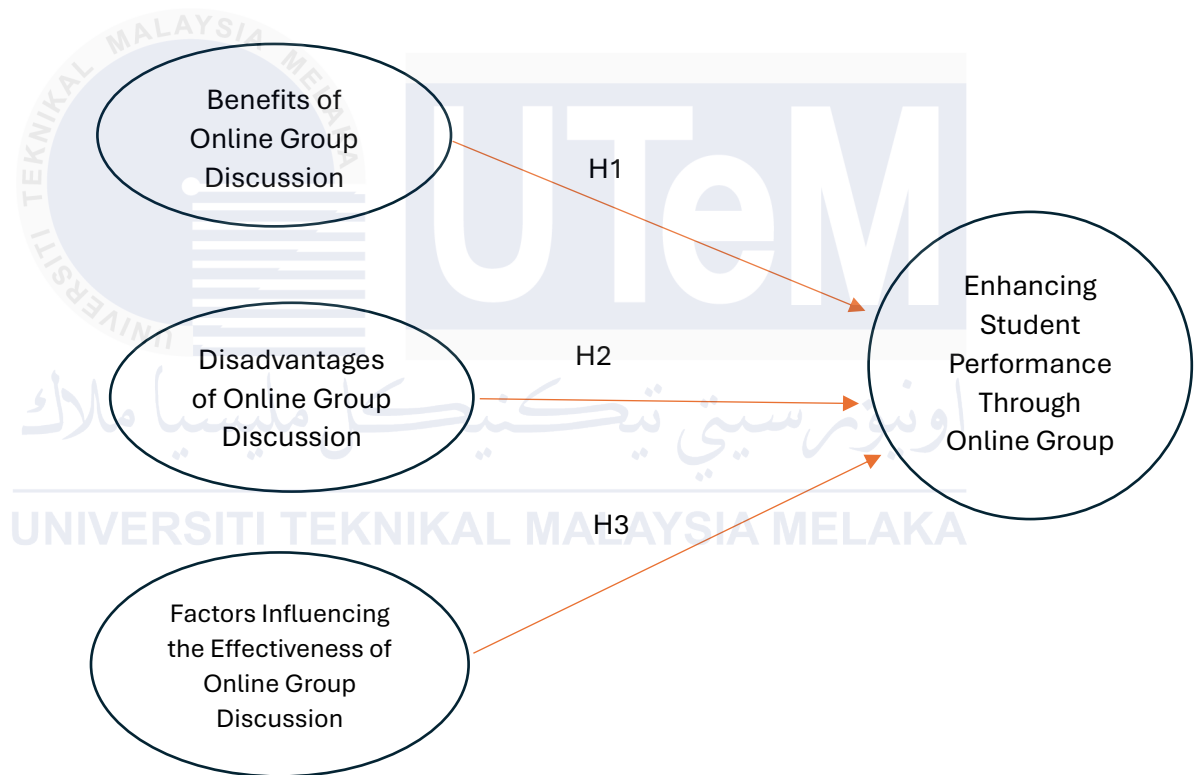
Figure 2.1: Theoretical Framework

2.5 Research Hypothesis

H_1: There is a significant relationship between the benefits of online group discussion and enhancing student performance.

H_2: There is a significant relationship between the disadvantages of online group discussion and enhancing student performance.

H_3: There is a significant relationship between factors influencing the effectiveness of online group discussion and enhancing student performance.
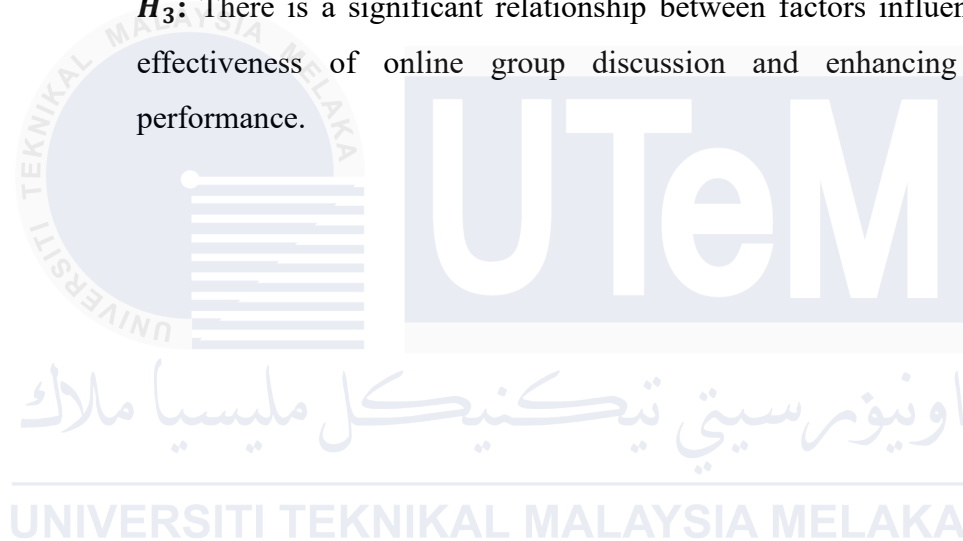
CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a fundamental component of scholarly research, covering the systematic tactics, procedures, and tools used to collect, analyze, and interpret data. It serves as the study's foundation, guiding researchers through the rigor and precision of their questions and hypotheses. The methodology used in a research study has a significant impact on its validity, reliability, and generalizability, emphasizing the need for thinking and intentional methodological decisions.

At its core, research methodology refers to the philosophical underpinnings that guide method selection, data-gathering procedures, and analytical approaches used to reach findings. It is more than just a set of methods; it is a full framework that links theoretical principles to practical study. The selection of an acceptable methodology begins with a clear grasp of the research problem and objectives, ensuring that the procedures are consistent with the study's goals.

Ethical issues, sample methodologies, data gathering methods, and data analysis strategies are all critical components of research methodology. Ethical considerations ensure that participants' rights are protected and that the study procedure is carried out properly. Sampling strategies dictate how participants or data points are chosen, which

influences the findings' representativeness and generalizability. Data collection methods must be dependable and legitimate to accurately gather the intended information. Data analysis methodologies, whether statistical for quantitative data or thematic for qualitative data, must be relevant to the study questions and design.

Research techniques are critical for guaranteeing clarity and concentration in scholarly work. By requiring researchers to precisely describe their study questions and objectives from the start, it creates a clear trajectory for the whole project, allowing them to keep concentration and prevent distractions from unnecessary data. Furthermore, preplanning research methods improves efficiency and saves time. Researchers can optimize their data collecting and analysis procedures by choosing the best strategies from the start, avoiding wasting time on ineffective methods. Furthermore, a strong research technique increases the credibility and trustworthiness of a study. It reveals the research's thoroughness and thoughtfulness, creating transparency that increases trust in the findings and their significance.

3.2 Research Design
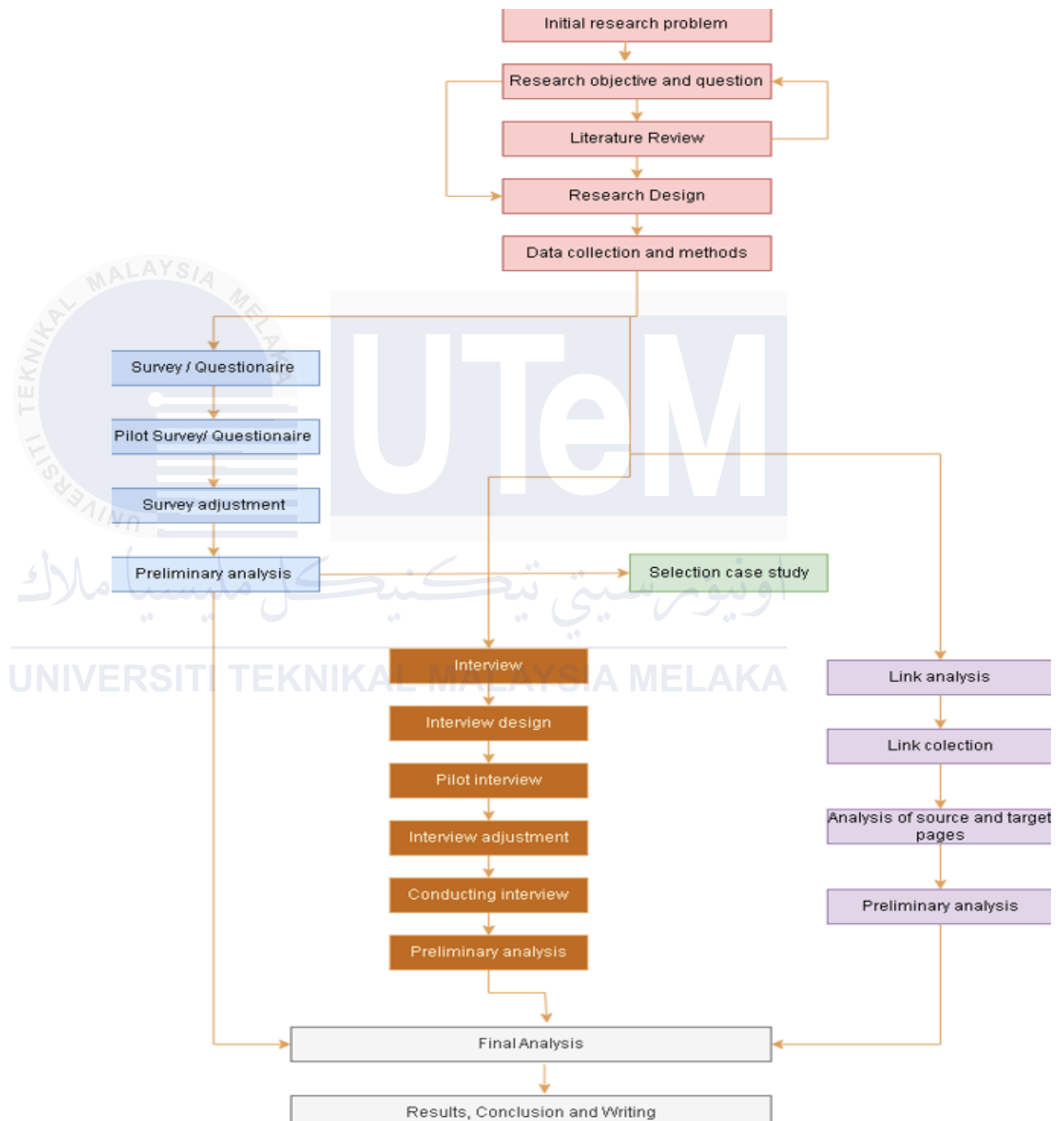
Taken from ResearchGate and modified by Muhammad Rezal Bin Abd Razak.

Figure 3.1: Overview of the Research Design Flow

A research design flow chart depicts the steps involved in a research investigation. It starts with a general research topic that is then narrowed into more specific research questions and objectives. The researcher then performs a literature review to determine what is already known about the subject. Based on this review, the researcher develops a study strategy that includes how they will gather data (through surveys and interviews) and how they will analyze it. After the data is collected, it is evaluated to identify patterns and trends. Finally, the researchers draw conclusions from their investigation and report their findings.

3.3 Methodology Choice

Quantitative methods are research methodologies that rely on statistical tools to analyze numerical data. These methods are critical in domains including economics, sociology, psychology, and public health, where researchers want to find patterns, test theories, and make predictions based on observable facts. Quantitative research frequently uses organized instruments like surveys, questionnaires, and databases to collect data that can be evaluated methodically. Graphs, charts, and tables are commonly used to portray results clearly and objectively. Quantitative methods, which employ mathematical, statistical, and computational techniques, provide a rigorous framework for investigating correlations between variables, establishing causation, and generalizing findings to wider populations. This approach is appreciated for its capacity to yield consistent and replicable outcomes, which contribute considerably to evidence-based practice and policymaking.

One of the primary benefits of quantitative methods is their ability to deliver consistent and reproducible results. The organized style of data collecting and analysis enables other researchers to reproduce the study, validate findings, and enhance the research's reputation. Furthermore, quantitative methods enable researchers to work with big data sets, allowing them to generalize findings to a larger population and improve the research's external validity. This is because the study was conducted on a wide scale with university students, so using quantitative methodologies is useful. This method also enables reliable variable measurement and the identification of statistical correlations, which can aid in determining causality rather than just correlation.

Furthermore, quantitative research makes it easier to apply advanced statistical tools, which can reveal complicated patterns and linkages that qualitative analysis may miss. These methods can help with hypothesis testing by giving empirical evidence that confirms or refutes theoretical claims. The capacity to examine data mathematically also helps to eliminate bias, as objective measurements reduce the influence of researcher subjectivity. In practice, the clear and succinct presentation of quantitative findings using visual tools like graphs and tables improves communication and comprehension across stakeholders, including policymakers, practitioners, and the public. As a result, quantitative methodologies are crucial for guiding evidence-based decision-making and creating effective interventions and policies.

3.4 Location of Research

The researcher picked Universiti Teknikal Malaysia Melaka (UTeM) as the site of this study due to its renowned reputation and strategic

emphasis on technical education and research excellence. Melaka is a historic state that was established in 2000. Furthermore, UTeM's lively academic community, which includes experienced teachers and a varied student body, promotes intellectual exchange and collaboration. The university's strong industry connections and cooperation with other research institutions expand available resources, allowing access to cutting-edge technology and knowledge. Conducting research at UTeM allows you to take advantage of our wide network and facilities, ensuring that your study is thorough, inventive, and influential. UTeM's active and supportive research environment makes it an excellent alternative for conducting high-quality research with the goal of making substantial contributions to the area.

The researcher chose Universiti Teknikal Malaysia Melaka (UTeM) as the site for her research on "The Role of Online Group Discussion in Improving Students' Performance Throughout Their Undergraduate Studies" for numerous reasons. UTeM, with its emphasis on technology integration in education, is an appropriate setting for researching the impact of online learning tools. The university's cutting-edge digital infrastructure enables a wide range of online learning platforms and tools, making it an ideal setting for researching the effectiveness of online group discussions.

Furthermore, UTeM's diversified undergraduate population provides a large and representative sample for this study, guaranteeing that the results are comprehensive and applicable to a wide range of students. The university's commitment to new teaching methods and continual attempts to improve the student learning experience are consistent with the study's aims. By focusing on UTeM, researchers can take advantage of the institution's existing digital learning infrastructure and preparedness to implement innovative teaching practices.

Furthermore, the supportive academic atmosphere at UTeM, which is distinguished by experienced faculty and active participation in

research, provides significant resources and insights that might enhance research. Collaboration with academic members who specialize in educational technology and online learning will be critical in creating and carrying out rigorous research. This environment ensures that the study not only investigates theoretical issues but also tests practical applications in real-world circumstances, resulting in improved educational methods at UTeM and potentially at other institutions.

3.5 Research Strategy

Table 3.1: Survey Method Planing

SECTION	Content
A	Respondent Background: • Gender • Age • Course • Year
B	Assessment of Independent Variable • The role of Online group Discussion (Benefits, Disadvantages, Factors)
C	Assessment of Dependent Variable • Enhancing student performance through online group discussion)

A survey is a data collection strategy used to obtain information about people's opinions, experiences, preferences, or behaviors (Elizabeth Martin, 2019). Paper-based questionnaires, internet forms, interviews, and phone calls are all methods of conducting surveys. Surveys are commonly used to collect important information for analysis and decision-making in academic settings, companies, and various research domains. In the scope of this study, the respondents that the researcher needs are students around UTeM from any faculty. So, researchers can survey by creating a Google Form or any type of form either online or physical form to ask them

questions that are more focused on the results we want. Surveys have significant economic advantages, especially when compared to more resource-intensive procedures such as interviews or focus groups. The introduction of online surveys widens their economic appeal by reducing the costs associated with paper, printing, and human data entry. Despite these cost-effective benefits, surveys have severe drawbacks in the form of poor response rates. This increases the danger of sample bias, as the fraction of people who choose to participate may not properly represent the larger population. The difficulty is to provide a representative sample to maintain the validity and reliability of the survey results. Consequently, while surveys provide economic benefits, addressing the challenges associated with response rates is important to maintain the integrity of the data obtained (DeFranzo et al, 2020).

Table 3.2: Likert-Scale

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

According Table 3.2, a likert scale is a popular psychometric instrument in surveys and questionnaires for gauging attitudes, views, or perceptions (Pritha Bhandari, 2020). Five points make up the scale you outlined which is 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree. Every point indicates how much one agrees or disagrees with a particular statement. If a statement says, "I feel confident in my ability to manage my time effectively," for instance, respondents can select the response that most accurately expresses their viewpoint.

3.5.1 Population

The population is the entire group that researcher want to conclude about (McCombes, S.,2019). The population that will be studied in this study is among students around Universiti Teknikal Malaysia Melaka (UTeM). All types of research strategies such as one-to-one interviews and surveys using questionnaires through Google Form will be conducted for students within the scope of the study only. Based on the Krejcie and Morgan table, the total population studied is 10,000 people and the required questionnaire data is 370 respondents.

3.5.2 Sample and Sampling Method

A sample is a specific group of individuals from which you will collect data (Dana P et al, 2020). The group that will be selected to successfully find the results of this data are students who are using this online group discussion method for the first time, namely students from the 2019/2020 session where they are students who had to study during the COVID-19 pandemic. A total of 47 students from each faculty will be asked to answer the questionnaire that has been prepared for the researcher to obtain the actual results of the study. A total of 370 data based on Krejcie and Morgan table will be collected from the questionnaire.

3.5.3 Pilot Testing

Pilot testing, also known as pilot studies, is a preliminary, smaller-scale version of a larger research project that is carried out ahead of time (Shakespeare, 2023). Its objective is to detect and fix potential concerns, ensuring that the main study runs well. In this research, the researcher will do the pilot testing on the 10 students first to see if the questionnaire is okay or not (Sutha Sundram et al, 2023). The key advantages of pilot testing include improving the research design, determining feasibility, and evaluating data collection methods. By testing planned methods such as surveys or interview questions, researchers can identify and correct issues that may affect the broader study, such as ambiguous wording or instructions. Furthermore, pilot testing helps to assess the feasibility of the research strategy, ensuring that participant recruitment, funding limits, and timetables are feasible. Furthermore, it allows researchers to assess the clarity and effectiveness of their data collection methods, ensuring that questions are well understood and that participants supply all relevant information. In essence, pilot testing is an important stage that can help save time, money, and resources by optimizing the research design before the main study begins.

3.6 Time Horizon

To investigate the association between online group conversations and student performance, researchers will utilize a cross-sectional time horizon in which data will be collected at a single time point (Adam Samuel, 2019). The goal is to determine how online group conversations affect students' performance at various points during their undergraduate studies. To accomplish this purpose, a wide sample of undergraduate

students from various years (freshmen to seniors) and disciplines will be chosen, offering a comprehensive picture of the potential benefits of online group discussions at different levels of undergraduate study. Data will be collected using surveys or questionnaires, with an emphasis on critical data points such as the frequency of involvement in online group discussions, student evaluations of their utility, current academic success (measured by GPA or recent grades), and engagement metrics. Additional important variables, such as study hours per week and participation in other academic activities, will be gathered.

Surveys will be administered at once to guarantee that all responses cover the same time period, and statistical approaches such as correlation analysis, regression analysis, and ANOVA will be utilized to investigate the association between online group discussion participation and student achievement. This method will aid in the identification of patterns or correlations between involvement in online group discussions and academic performance, with subgroup analyses performed to determine whether the link varies by year of study or discipline. These findings will be viewed as reflecting the current importance of online group conversations in student performance, with the caveat that, because this is a cross-sectional study, it cannot demonstrate causality and does not account for changes over time.

3.7 Data Analysis

The researcher used descriptive statistical methods to analyze the Google Form responses obtained from the survey. For quantitative variables, key metrics such as the mean, median, mode, range, and standard deviation give a central tendency and dispersion analysis, revealing the data's central values and variation. The data will be

converted into numbers to be easy to handle. For the interview part, the entire interview process will be recorded to ensure that all data can be captured. After that, the record will be transferred to the transcript form.

3.7.1 Validity

In research, validity refers to how well a study represents or examines the specific idea being measured (Cecilia Maria Patino et al, 2020). It reveals how well the results of a study correspond to the real-world events they are supposed to portray. Validity has numerous dimensions, including internal validity, which considers whether the observed effects are truly due to the experimental conditions rather than other factors, and external validity, which considers the generalizability of the study's findings to broader contexts.

3.7.2 Reliability (Cronbach's alpha)

Table 3.3: Cronbach's Alpha Coefficient Range and Strength of Association

No	Coefficient of Cronbach's Alpha	Reliability Level
1	More than 0.90	Excellent
2	0.80-0.89	Good
3	0.70-0.79	Acceptable
4	0.6-0.69	Questionable
5	0.5-0.59	Poor
6	Less than 0.59	Unacceptable

Reliability refers to a measurement instrument's consistency and stability in measuring a notion throughout time (Middleton, 2019).

Cronbach's alpha, a statistic used to evaluate the internal consistency of a set of items or a scale, is one of the most often used methods for assessing reliability. Cronbach's alpha analyzes how closely connected a group of items is, offering an approximation of the composite score's reliability. A high Cronbach's alpha value, which is often more than 0.7, indicates that the items have good internal consistency and are most likely assessing the same underlying concept. This parameter is critical in research since it assures that the instrument generates consistent results, lowering measurement error and increasing the validity of the study's conclusions. Using Cronbach's alpha, researchers can improve their instruments by ensuring that each item contributes significantly to the total measurement, thus increasing the robustness and credibility of their study findings.

3.7.3 Correlation (Pearson coefficient)

Table 3.4: Scale of Correlation Coefficients

Scale of correlation coefficient	Value
$0 < r \leq 0.19$	Very Low Correlation
$0.2 \leq r \leq 0.39$	Low Correlation
$0.4 \leq r \leq 0.59$	Moderate Correlation
$0.6 \leq r \leq 0.79$	High Correlation
$0.8 \leq r \leq 1.0$	Very High Correlation

Correlation, as assessed by the Pearson coefficient, is a statistical method used in research to determine the degree and direction of a linear relationship between two continuous variables (Pritha Bhandari, 2021). The Pearson coefficient ranges from -1 to +1, with values closer to 1 indicating a significant positive correlation, which means that when one variable grows, so does the other. A score closer to -1, on the other hand,

suggests a significant negative correlation, which occurs when one variable increases while the other decreases. A number close to zero indicates little to no linear relationship. It's vital to understand that the Pearson coefficient only evaluates linear correlations, which means it determines how effectively data points form a straight line on a graph. The Pearson coefficient is ineffective when the relationship between variables is non-linear, as data points may cluster or curve.

For example, in research titled "The Role of Online Group Discussion in Enhancing Student Performance Throughout Their Undergraduate Study," the Pearson coefficient can be used to determine the relationship between the frequency of participation in online group discussions and student performance, as measured by GPA. If the study finds a positive association (r=0.7), it implies that students who regularly participate in online group discussions have higher GPAs. This allows academics to better evaluate the possible impact of online group discussions on student achievement. The Pearson coefficient is useful in such studies because it investigates potential correlations between variables, prompting additional research into the underlying causes of these relationships. Furthermore, a large correlation can occasionally indicate predictive capability; knowing how frequently a student participates in online group discussions may allow for some prediction of their GPA. However, it is important to realize that correlation does not always imply causation and other factors may influence academic achievement. Using the Pearson coefficient, researchers can acquire useful insights into how participation in online group discussions interacts with and influences student performance, thereby improving their understanding of the research issue.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Figure 3.2: Formula Correlation

Based on figure 3.2 shows that n is the sample size, **x** & **y** are the 1th sample points and x^2 & y^2 are the sample means for the random variables x and y respectively (Sebastian Taylor, 2023).

The sign of r indicates the strength of the linear relationship between the variables.

- If r is near 1, then the two variables have a strong linear relationship.
- If r is near 0, then the two variables have no linear relation.
- If r is near -1, then the two variables have a weak (negative) linear relationship.

Let us see the applications of the correlation coefficient formula in the following section.

3.7.4 Linear Regression Analysis

$$y = \beta_0 + \beta_1 x$$
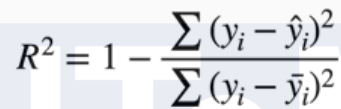
Figure 3.3: Formula Linear Regression

Linear regression is a statistical approach for modeling and analyzing the connection between a dependent variable and one or more independent variables (Vijay Kanade, 2018). The fundamental goal of linear regression is to predict the value of the dependent variable using the values of the independent variables while also determining the degree and direction of their association. This technique presupposes a linear relationship, which

means that changes in the independent variables produce corresponding changes in the dependent variable.

3.7.4.1 R Square

$$R^2 = 1 - \frac{sum\ squared\ regression\ (SSR)}{total\ sum\ of\ squares\ (SST)}.$$

$$R^2 = 1 - \frac{\sum (y_i - \hat{y}_i)^2}{\sum (y_i - \bar{y}_i)^2}$$

Figure 3.4: Formula R-squre

R-squared, also known as the coefficient of determination, is a measure of how much of the variance in the dependent variable can be predicted by the independent variable (Arkhan, 2019). It goes from 0 to 1, with 0 indicating that the model explains no variability in the outcome variable and 1 indicating that it explains all variability.

3.7.4.2 F Value

$$F = \frac{TSS - RSS}{P - 1} \div \frac{RSS}{n - p}$$

Figure 3.5: Formula F-value

The F-value is derived from the F-test and is used to determine the overall significance of the regression model (Vendatu, 2020). It determines if at least one predictor in the model has a non-zero coefficient. A high F-value shows that the model is well-suited to the data. The F-test

contrasts the model with no predictors to see if the observed association between the dependent and independent variables is statistically significant.

3.7.4.3 T Value

The t-value is used in conjunction with the t-test to assess the significance of specific regression coefficients. It tests the null hypothesis, which states that a specific coefficient is zero (Rebecca Bevans, 2020). A high t-value implies that the corresponding coefficient differs significantly from zero. The t-value is the estimated coefficient divided by its standard error.

CHAPTER 4

ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter will discuss the questionnaire result from respondents to the titled which is the role of online group discussion in enhancing the performance of undergraduate students. The researcher has found quantitative research that has an impact on the performance of undergraduate students. This chapter will identify the role of online group discussions in student performance. SPSS software will be used to code and key in all the results received from the questionnaires. The data will then be analyzed and interpreted. All the questions of the questionnaires were ensured to be answered by all the respondents without any blanks in the questionnaire. All the data that has been collected will be analyzed in the table form by Windows software version which is IBM SPSS Statistic version 27.

4.2 Descriptive Analysis (Frequency)

4.2.1 Gender
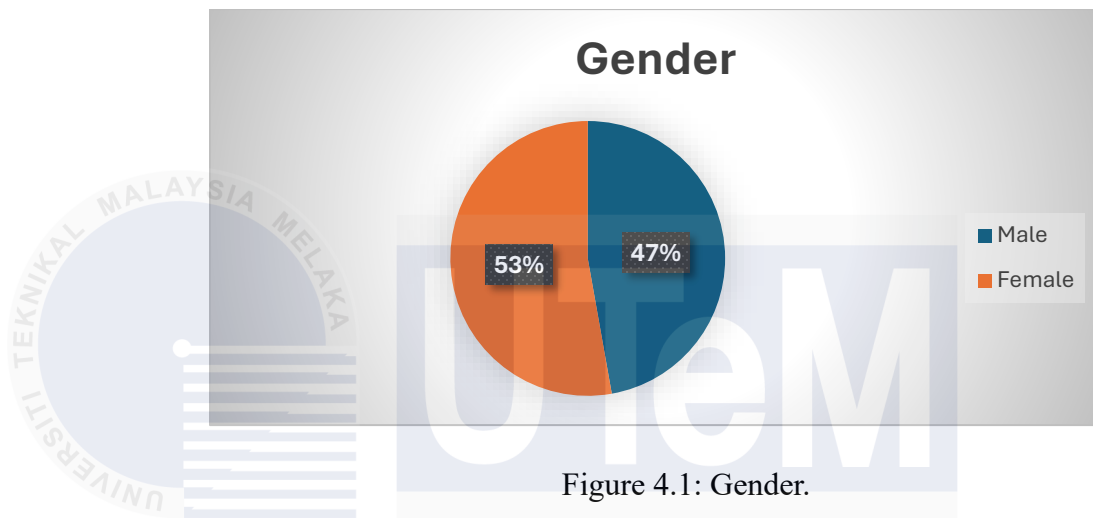
Figure 4.1: Gender.

The gender distribution of those who answered the questionnaire is shown in Figure 7. It revealed that there are 101 or 47.2 percent of male respondents and 113 or 52.8 percent of female respondents. From the data analysis of this research, the female respondents participated more than the male respondents. However, this research is randomly distributed by the researcher and does not select the gender of respondents systematically.

4.2.2 Race
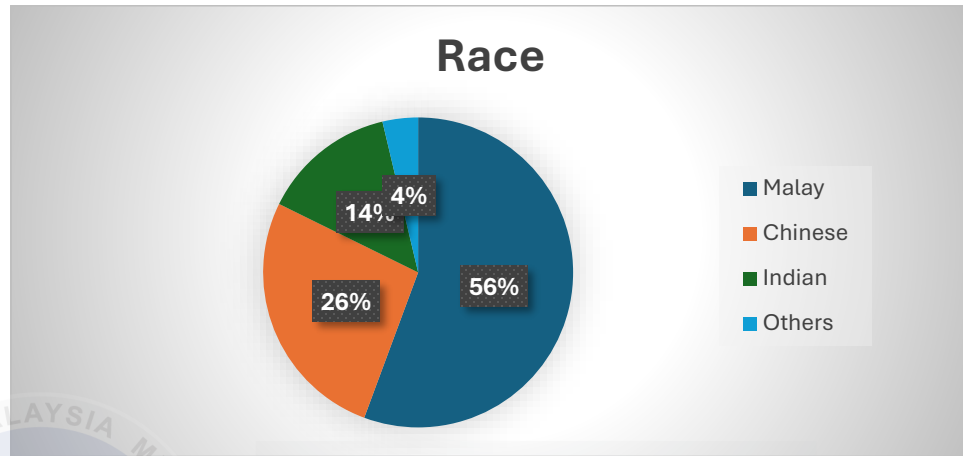
Figure 4.2: Race.

Figure 8 shows that 119 or 55.6 percent of respondents are Malay, 57 or 26.6 percent of respondents are Chinese, and 30 or 14 percent of respondents are Indian. The other 8 or 3.7 percent balance is other races such as Bumi Putera Sabah, Kayan, Bugis, Dusun, and Siamese.

4.2.3 Faculty
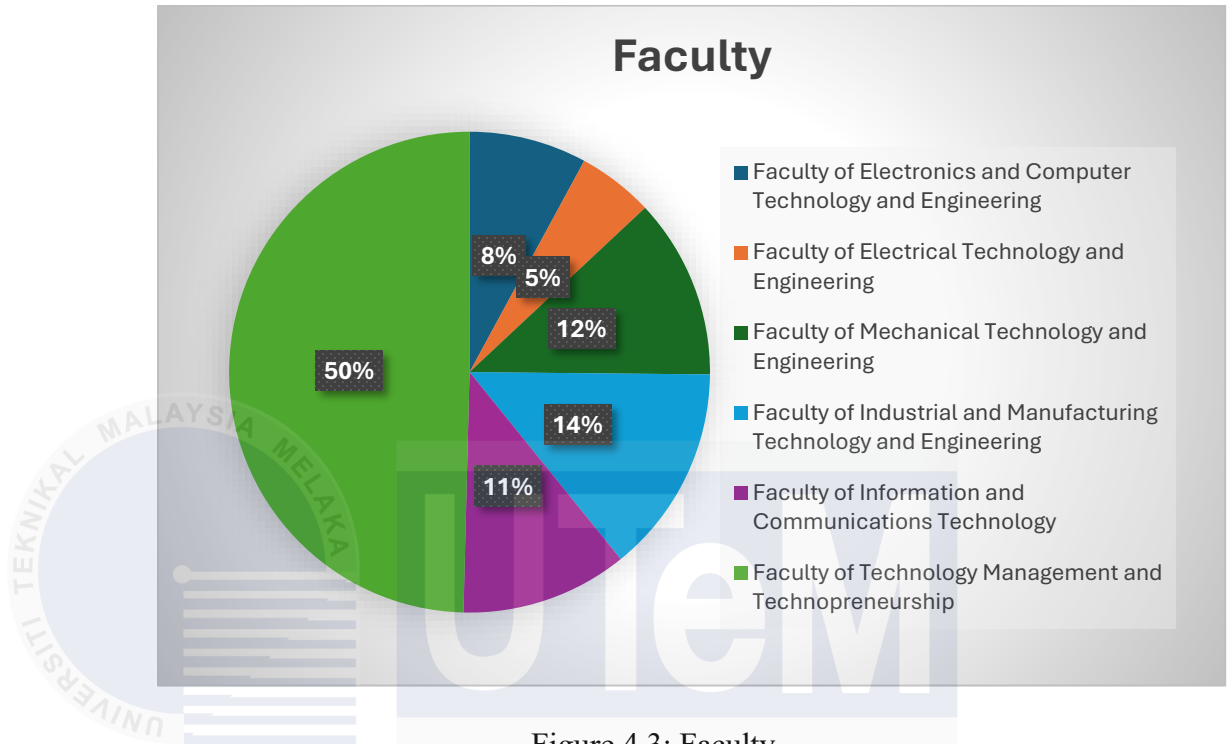
Figure 4.3: Faculty.

Figure 9 showed 106 or 50 percent of respondents are from the Faculty of Technology Management and Technopreneurship. Followed by a value of 30 or 14 percent of respondents are from the Faculty of Industrial and Manufacturing Technology and Engineering. After that, 24 people, or 11.2 percent, are from the Faculty of Information and Communications Technology. In addition, 26 people, or 12.1 percent of respondents are from the Faculty of Mechanical Technology and Engineering. Finally, the remaining 11 people, or 5.1 percent, are from the Faculty of Electrical Technology and Engineering.

4.2.4 Year of Study
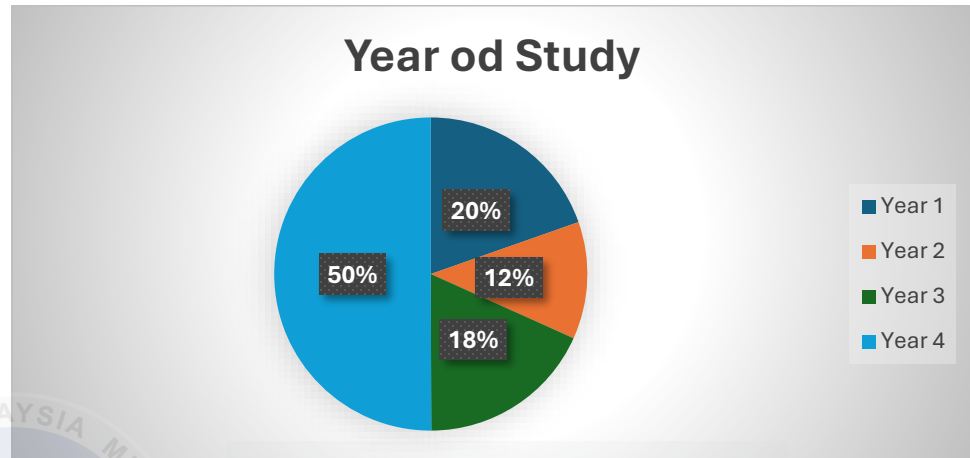
Figure 4.4: Year of Study.

Figure 10 shows the highest percentage is from year 4 respondents which is 50 percent or 107 people. Next is from year 1 which is 19.6 percent or 42 people. In addition, 18.2 percent or 39 people are from year 3. Last but not least are from year 2 which is 12.1 percent or 26 people.

4.2.5 Familiarity with Making Online Group Discussion

Figure 4.5: Familiarity with Making Online Group Discussion.

Based on figure 11 which is about familiarity with making online group discussions shows that 80.4 percent or 172 people are familiar with making online group discussions. This helps completely in the researcher's study to ensure that the survey is answered by the right respondent. In addition, as many as 19.6 percent, or 42 people out of a total of 214 respondents are not familiar with making online group discussions.

4.3 Result of Data Analysis

4.3.1 Normality Test

Table 4.1: Normality Test: Skewness and Kurtosis

(Sources: SPSS Output)

	Skewness		Kurtosis	
	Statistic	**Std. Error**	**Statistic**	**Std Error**
IV1.1	-1.279	0.166	2.304	0.331
IV1.2	-1.300	0.166	2.413	0.331
IV1.4	-1.559	0.166	3.697	0.331
IV1.4	-1.572	0.166	2.815	0.331
IV2.1	-1.114	0.166	1.205	0.331
IV2.2	-0.921	0.166	1.201	0.331
IV2.4	-1.107	0.166	1.782	0.331
IV3.1	-1.238	0.166	2.606	0.331
IV3.2	-1.370	0.166	2.752	0.331
IV3.3	-1.439	0.166	3.292	0.331
IV3.4	-1.363	0.166	3.119	0.331
DV1	-1.358	0.166	2.245	0.331
DV2	-1.309	0.166	2.406	0.331
DV3	-1.284	0.166	2.079	0.331
DV4	-1.424	0.166	2.096	0.331
DV5	-1.541	0.166	3.066	0.331

Skewness and kurtosis are important metrics for determining the distributional form of a dataset. Skewness measures the data's symmetry a distribution that is more skewed to the left with larger values is said to be

negative, whereas a distribution that is more skewed to the right with smaller values is said to be positive (Jennifer, 2023).

Kurtosis is a statistical term that assesses the form of a distribution's tails and peak in relation to a normal distribution (Anders Kallner, 2018). It describes the extent to which data values cluster in the tails or near the peak of the distribution. In this table, the kurtosis statistic ranges between 1.205 and 3.697. Value from -3 to +3 are acceptable. In this study, there is some value such as, 2.304, 2.413 and 2.245 are close to 3 and might be considered mesokurtic. Next the higher values such as 3.292, 3.119 and 3.697 suggest a tendency toward leptokurtic distribution. Last but not least, lower values such as 1.205 and 1.201 are indicate platykurtic distribution. This show that the data set is stable and unaffected by significant outliers.

4.3.2 Reliability Test

4.3.2.1 Pilot Test

A pilot test is a form of software testing that verifies in real-time a component of the system or the entire system. A pilot test promotes decision-making and thus acts as a small-scale experiment or collection of observations conducted to assess how and when a full-scale project should be launched (Hassan et al, 2018). In addition, the pilot test ensures that the respondents understand the question and complete the questionnaires that had been submitted. Pilot testing is essential to ensure the research's performance is running smoothly.

All the associated between all independent variables and dependent variables revealed by the pilot test. There of 10 respondents chosen by using a survey questionnaire to perform the pilot test.

Table 4.2: Reliability Statistic (Pilot test)

(Sources: SPSS Output)

	Cronbach's Alpha	N of Items
IV1	0.850	4
IV2	0.803	4
IV3	0.839	4
DV	0.832	6

Cronbach's Alpha (pilot test) for independent variable 1 is 0.850, independent variable 2 is 0.803, independent variable 3 is 0.839, and dependent variable is 0.832 which was obtained from reliability statistics. According Ahmad et al, 2024 stated that values of 0.80 and above indicate that the questions are being measured on the same scale. The value from the table show it all above 0.80, showed the questionnaire was reliable. Table 7 below shows the 3 items of independent variables. The amount of correlates is average between 0.803 to 0.850. This proved that there are strong correlations for all items. The independent and dependent variables can be used in the actual survey questionnaire once the reliability is valid.

Table 4.3: Cronbach's Alpha Test of Reliability (Pilot Test)

(Sources: SPSS Output)

Variables	Cronbach's Alpha	Number of Items	Result
IV1: Benefits of Online Group Discussion.	0.850	4	Good
IV2: Disadvantages of Online Group Discussion.	0.803	4	Good
IV3: Factors Influencing the Effectiveness of Online Group Discussion.	0.839	4	Good
DV: Enhancing Student Performance Through Online Group Discussion.	0.832	6	Good

4.3.2.2 Reliability test

Table 4.4: Reliability Statistic

(Sources: SPSS Output)

	Cronbach's Alpha	N of Items
IV1	0.838	4
IV2	0.842	4
IV3	0.844	4
DV	0.883	5

Cronbach's Alpha for independent variable1 is 0.838, independent variable 2 is 0.842, independent variable 3 is 0.844, and dependent variable is 0.883 which was obtained from reliability statistics. (Ahmad et al, 2024) stated that values of 0.80 and above indicate that the questions are being measured on the same scale. The value from the table show it all above 0.80, showed the questionnaire was reliable. Table 9 below shows the 3 items of independent variables and 1 item of dependent variable. The amount of correlates is average between 0.838 to 0.883. This proved that there are strong correlations for all items. The independent and dependent variables can be used in the actual survey questionnaire once the reliability is valid.
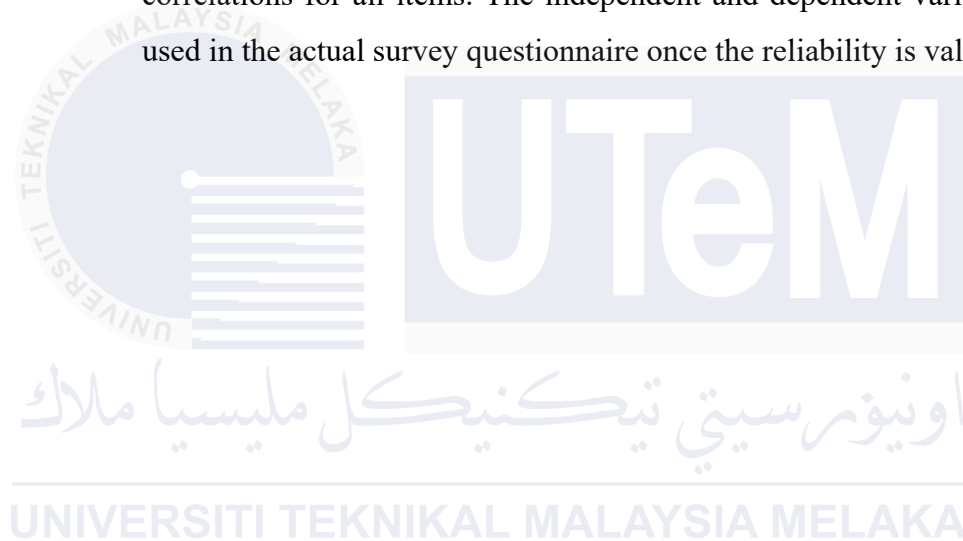
4.3.3 Correlation Test

Table 4.5: Correlations Table

(Sources: SPSS Output)

Correlations		IV1 MEAN	IV2 MEAN	IV3 MEAN	DV MEAN
IV1 MEAN	Pearson correlation	1	.337**	.595**	.793**
	Sig. (2 tailed)		<0.01	<0.01	<0.01
	N	214	214	214	214
IV2 MEAN	Pearson correlation	.337**	1	.510**	.409**
	Sig. (2 tailed)	0.01		<0.01	<0.01
	N	214	214		
IV 3 MEAN	Pearson correlation	.595**	.510**	1	.649**
	Sig. (2 tailed)	<0.01	<0.01		<0.01
	N	214	214	214	
DV MEAN	Pearson correlation	.793**	.409**	.649**	1
	Sig. (2 tailed)	<0.01	<0.01	<0.01	
	N	214	214	214	214

** . Correlation is significant at the 0.01 level (2-tailed)

Table 9 shows the relationship between independent variables and dependent variables. The relationship between variable can be consider as

significant value in context. The value of correlation (R-value) can be represented into three values, which are (0.0 – 0.3= weak), (0.4 – 0.6= moderate) and (0.7+ and above = strong values) (J. Fernando, 2024). The table above shows the correlation between independent variables (The Role of Online Group Discussion) and dependent variable (Enhancing Student Performance Through Online Group Discussion).

The table shows the correlation coefficients calculated by Pearson between three independent variables (IV1, IV2, IV3) and a dependent variable (DV), as well as their statistical significance and sample size (N = 214). The results demonstrate that independent variable 1 has the largest positive correlation with DV (r = 0.793, p < 0.01), demonstrating a strong association and implying that increases in independent variable 1 are strongly related to increases in the dependent variable (Enhancing Student Performance Through Online Group Discussions). Independent variable 3 shows a high positive association with dependent variables (r = 0.649, p < 0.01), while IV2 has a moderate positive correlation (r = 0.409, p < 0.01). The correlations are all statistically significant at the 0.01 level. The independent variables exhibit moderate to weak interrelationships, with independent variable 1 and independent variable 3 having the strongest intercorrelation (r = 0.595, p < 0.01). These findings indicate that independent variable 1 is the strongest predictor of the dependent variable, followed by independent variable 3 and independent variable 2. The practical conclusion is that improving independent variable 1 may result in higher improvements in student performance via online group discussions.

4.3.4 Multiple Regression Analysis

4.3.4.1 R-Square

Table 4.6: Multiple Regression Analysis (Model Summary)

(Sources: SPSS Output)

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.825[a]	.681	.677	.39844

R-squared, also known as the coefficient of determination, is a measure of how much of the dependent variable's variation can be predicted using the independent variable. It ranges from 0 to 1, with 0 suggesting that the model does not explain the variability in the outcome variable and 1 indicating that it does (Yarilet Parez, 2024). The R-squared value is 0.681, indicating that the independent variables independent variable 1 MEAN, independent variable 2 MEAN, and independent variable 3 MEAN in the model account for 68.1% of the variance in the dependent variable MEAN. This suggests a substantial link between the predictor and the dependent variable, as the model captures the majority of the variability. The adjusted R-squared value of 0.677 accounts for the number of predictors in the model, resulting in a more realistic estimate of explanatory power when several independent variables are included.

4.3.4.2 F-value

Table 4.7: Multiple Regression Analysis (ANOVA)

(Sources: SPSS Output)

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	71.213	3	23.738	149.527	$< 0.01^{b}$
	Residual	33.338	210	.159		
	Total	104.550	213			

The F-test yields the F-value, which determines the regression model's overall significance. It checks whether at least one predictor in the model has a non-zero coefficient. A high F-value suggests that the model fits the data extremely well (K Feldman, 2022). From the table 11 above, the F-value is 149.527, indicating a significant level ($p < 0.001$). This signifies that the total regression model is statistically significant and a good fit for the data. In other words, predictors independent variable 1, independent variable 2, and independent variable 3 have a substantial combined effect on the dependent variable. A high F value suggests that the regression sum of squares model can explain more of the variation than the residual sum of squares.

4.3.4.3 T-value

Table 4.8: Multiple Regression Analysis (Coefficient[a])

(Sources: SPSS Output)

Model		Unstandardized Coefficient		Standardized Coefficient			Collinearity Statistics	
		B	**Std. Error**	**Beta**	**t**	**Sig.**	**Tolerance**	**VIF**
1	(Constant)	.238	.208		1.148	.252		
	IV1 MEAN	.618	.048	.626	12.891	<.001	.645	1.552
	IV2 MEAN	.075	.045	.077	1.690	.092	.738	1.356
	IV3 MEAN	.251	.056	.0237	4.462	<.001	.538	1.860

The t-value is used alongside the t-test to assess the significance of individual regression coefficients. It tests the null hypothesis, which holds that a specific coefficient is zero. A high t-value indicates that the corresponding coefficient differs significantly from zero. The t-value is calculated as the estimated coefficient divided by the standard error (Kasphar Kalkis, 2022). The independent variable 1 MEAN (t = 12.891, p < 0.001) indicates that independent variable 1 is a significant predictor of the dependent variable (Enhancing Undergraduate Students' Performance). Its standardized coefficient, Beta = 0.626, indicates that it has the greatest effect among the variables. Following that, independent variable 2 MEAN yields a value of t = 1.690, p = 0.092, suggesting that independent variable 2 is not statistically significant at 0.05. This demonstrates that independent variable 2 does not significantly contribute to the prediction of the dependent variable in this

model. Independent variable 3 MEAN (t = 4.462, p < 0.001) indicates its significance as a predictor of the dependent variable. Its Beta value (0.237) indicates a smaller yet significant contribution than independent variable 1.

4.4 Result Discussion

Analyzing skewness and kurtosis provides information about the dataset's distributional features. Skewness values show the data's symmetry, with distributions ranging from negatively to positively skewed based on the direction and size of the skew. Kurtosis values range from 1.205 to 3.697, indicating various patterns in the sample. Values close to 3 such as 2.304, 2.413, and 2.245 indicate mesokurtic distributions, which closely resemble the normal distribution. Higher kurtosis values, such as 3.292, 3.119, and 3.697, indicate leptokurtic tendencies, with sharper peaks and heavier tails. Lower values, such as 1.205 and 1.201, indicate platykurtic distributions with flatter peaks and lighter tails. Overall, the dataset demonstrates a variety of distributional shapes, but it is stable and unaffected by substantial outliers, indicating its appropriateness for future investigation.

Based on correlation test, it highlights the relationships between the independent variables (IV1: Benefits of Online Group Discussion, IV2: Disadvantages of Online Group Discussion, IV3: Factors Influencing Effective Online Group Discussion) and the dependent variable (DV: Enhancing Student Performance Through Online Group Discussion). IV1 (Benefits of Online Group Discussion) has the highest positive correlation with the dependent variable (r = 0.793, p < 0.01), indicating a substantial link. This implies that stressing the benefits of online group discussions can considerably impact student achievement. IV3 (Factors Influencing Effective Online Group Discussion) has a strong positive correlation with the dependent variable (r = 0.649, p < 0.01), indicating its significance in

promoting effective group discussions. IV2 (drawbacks of Online Group Discussion) has a modest positive association with the dependent variable ($r = 0.409$, $p < 0.01$), indicating that while addressing drawbacks is good, its impact is less pronounced than independent variable 1 and 3. So in conclusion, prioritizing techniques to maximize the benefits of online group discussions (IV1) and addressing critical aspects that affect their effectiveness (IV3) can result in significant gains in student performance.

The R-squared value of 0.681 in the multiple regression analysis indicates that the independent variables: Benefits of Online Group Discussion (IV1), Disadvantages of Online Group Discussion (IV2), and Factors Influencing Effective Online Group Discussion (IV3) can explain 68.1% of the variation in student performance (DV: Enhancing Student Performance Through Online Group Discussion). Given the amount of predictors in the model, the corrected R-squared value of 0.677 is marginally more accurate. This demonstrates a high association between the independent variables and student performance, implying that focusing on these aspects can greatly improve outcomes in online group discussions.

Furthermore, for the F-test result with an F-value of 149.527 and a significance threshold of $p < 0.001$ demonstrates that the regression model is statistically significant and fits the data. This means that the independent variable (Benefits of Online Group Discussion, IV1), (Disadvantages of Online Group Discussion, IV2), and Factors Influencing Effective Online Group Discussion (IV3)—all have a significant effect on the dependent variable, Enhancing Student Performance Through Online Group Discussion (DV).

The high F-value indicates that the model explains a significant portion of the variation in the dependent variable, highlighting the combined importance of the predictors in understanding and enhancing student performance through online group discussions.

Finally, for the t-value test discusses how the independent variables affect the dependent variable, Enhancing Student Performance Through Online Group Discussion (DV). IV1 (Benefits of Online Group Discussion) is the most significant predictor (t = 12.891, p < 0.001) and has the greatest standardized coefficient (Beta = 0.626), showing a large influence on student performance. IV2 (Disadvantages of Online Group Discussion), with t = 1.690 and p = 0.092, is not statistically significant at the 0.05 level, indicating that it makes no significant contribution to predicting student performance in this model. IV3 (Factors Influencing Effective Online Group Discussion) is a significant predictor, with t = 4.462, p < 0.001, and a Beta value of 0.237, suggesting a reduced but still substantial contribution compared to IV1. Overall, the findings show that IV1 (Benefits of Online Group Discussion) has the biggest impact on student performance, followed by IV3, with IV2 playing a less important contribution.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter summarized the results of this study. A conclusion is drawn from the result and recommendations are made for future research to investigate the role of online group discussions in enhancing the performance of undergraduate students. Besides, it also explores more about the most influencing independent variable that influence the performance of undergraduate students. This study was administered to 370 respondents. The main target is UTeM's students. In this chapter, this research will make an effort to answer the question or research objective and draw a conclusion from the result of Chapter 4. In addition, the limitations of the study and recommendations for future research will be presented.

5.2 Research Objectives Achievement

Objective 1: To investigate the extent to which online group discussions impact students' learning effectiveness throughout their undergraduate studies.

The study effectively met its objective of analyzing how online group discussions impact students' learning effectiveness during their undergraduate years, providing valuable insights through regression analysis. The results show that 68.1% of the variation in student performance is explained by the independent variables in the model ($R^2 = 0.681$). This high proportion indicates that the predictors included in the study such as the benefits, disadvantages, and factors influencing effective online group discussions are closely related to students' academic success, confirming the relevance of these variables.

The overall regression model was found to be highly statistically significant ($F = 149.527$, $p < 0.001$), which means the relationship between the independent variables and the dependent variable (student performance) is not due to random chance. This strong significance reinforces the validity of the findings and the importance of the predictors in influencing learning outcomes.

In essence, the results highlight the critical role of online group discussions in improving students' learning effectiveness. Specifically, these discussions provide opportunities for collaboration, knowledge exchange, and deeper engagement with course material, all of which significantly contribute to better academic performance. By focusing on optimizing the benefits and addressing key factors that improve discussion effectiveness, educators and institutions can harness the full potential of online group discussions to enhance students' learning experiences.

Objective 2: To understand their interrelationships, analyze the correlations among different elements of online group discussions.

The study successfully achieved its goal of understanding the interrelationships among different elements of online group discussions. The analysis showed that these elements are interconnected in meaningful ways. First, there is a moderate positive correlation between IV1 (Benefits of Online Group Discussion) and IV2 (Disadvantages of Online Group Discussion) ($r = 0.337$, $p < 0.01$), suggesting that while benefits and disadvantages are distinct, they may share some overlapping factors that influence their perception or impact. Second, a strong positive correlation exists between IV1 (Benefits of Online Group Discussion) and IV3 (Factors Influencing Effective Online Group Discussion) ($r = 0.595$, $p < 0.01$), indicating that the perceived benefits of online discussions are closely aligned with the factors that enhance their effectiveness. Lastly, a moderate to strong positive correlation was observed between IV2 (Disadvantages of Online Group Discussion) and IV3 (Factors Influencing Effective Online Group Discussion) ($r = 0.510$, $p < 0.01$), implying that addressing disadvantages may also help improve the overall effectiveness of online group discussions. These findings collectively demonstrate how the benefits, disadvantages, and effectiveness factors interact, providing a comprehensive understanding of how online group discussions contribute to student performance and learning outcomes.

Objective 3: To determine the dominant elements of online group discussions that significantly contribute to enhancing student learning effectiveness throughout their undergraduate studies

The study effectively identified the key elements of online group discussions that enhance student learning by analyzing the unstandardized coefficients (B-values) from the regression model. These B-values provide

insight into the relative contribution of each independent variable to predicting student performance.

The Benefits of Online Group Discussion (IV1) emerged as the most significant factor, with the highest B-value (B = 0.618). This indicates that for every unit increase in the benefits perceived from online group discussions, student performance improves by 0.618 units, making it the strongest predictor of learning outcomes. This result underscores the critical importance of leveraging the advantages of online group discussions, such as collaboration and idea-sharing, to enhance learning effectiveness.

The Factors Influencing Effective Online Group Discussion (IV3) also had a substantial positive impact, with a B-value of 0.251. This suggests that for every unit increase in factors that improve the quality and effectiveness of discussions—such as clear guidelines, active participation, and facilitation—student performance improves by 0.251 units. While not as impactful as IV1, these factors still play an important role in ensuring the success of online discussions.

In contrast, the Disadvantages of Online Group Discussion (IV2) showed a much smaller B-value (B = 0.075), indicating that while disadvantages like technical challenges or lack of engagement do influence performance, their impact is relatively minor compared to the benefits (IV1) and effectiveness factors (IV3). This suggests that addressing disadvantages may help reduce barriers but is not as crucial to directly improving learning outcomes.

In summary, the results demonstrate that focusing on enhancing the benefits (IV1) and the factors that make online discussions effective (IV3) yields the greatest improvement in student learning. Addressing disadvantages (IV2) is less impactful but can still contribute to creating a more supportive environment for online group discussions. These findings provide clear guidance for designing and implementing online discussions to maximize their positive effects on student performance.

5.3 Research Hypothesis Achievement

H^1: **There is a significant relationship between the benefits of online group discussion and enhancing student performance.**

The results strongly support the hypothesis that the benefits of online group discussions significantly enhance student performance. The regression analysis shows that the Benefits of Online Group Discussion (IV1) have the highest t-value (t = 12.891), indicating that this variable is the most impactful predictor in the model. The high t-value demonstrates a robust and statistically significant relationship between IV1 and student performance, confirming that leveraging the benefits of online group discussions, such as improved collaboration and active engagement, plays a pivotal role in enhancing learning outcomes. This finding is consistent with previous research emphasizing the transformative potential of collaborative learning environments in fostering academic success. This aligns with findings (Hwangji Lu, 2022), who emphasize the role of collaboration and interaction in fostering a productive learning environment within online settings.

These results are consistent with prior studies, such as those by (Nor Fariza, 2019) which highlight the value of online group discussions in fostering collaborative learning, deeper understanding, and engagement. By utilizing these benefits, educators can create more effective online learning environments that enhance performance and satisfaction among students. Overall, the data provides strong evidence of a significant relationship between leveraging the benefits of online group discussions and improving student performance, validating the hypothesis.

H^2: **There is a significant relationship between the disadvantages of online group discussion and enhancing student performance.**

The findings do not strongly support this hypothesis, as the Disadvantages of Online Group Discussion (IV2) show a low t-value of 1.690. This suggests that while IV2 may have a minor role, it does not significantly predict student performance at the 0.05 level. The relatively low t-value reflects the limited contribution of addressing the drawbacks of online discussions, such as technical challenges or lack of engagement, to improving learning outcomes. These results align with previous studies, which indicate that while minimizing disadvantages is necessary to create a supportive environment, it does not independently drive substantial improvements in performance.

These findings are consistent with prior research emphasizing that addressing drawbacks is necessary to create a conducive learning environment but insufficient on its own to significantly impact performance (Villarreal, 2020). Instead, focusing on maximizing the advantages and fostering effective group dynamics is more likely to yield substantial improvements. Therefore, the data indicates that the disadvantages of online group discussions have a minimal and indirect impact on enhancing student performance.

H^3: **There is a significant relationship between factors influencing the effectiveness of online group discussion and enhancing student performance.**

The findings support this hypothesis, as the Factors Influencing Effective Online Group Discussion (IV3) exhibit a significant t-value of 4.462. This indicates that IV3 plays an important role in predicting student performance, highlighting the need to focus on elements such as clear communication, structured guidelines, and active participation to optimize the effectiveness of

online group discussions. Although the t-value of IV3 is lower than that of IV1, it still demonstrates a meaningful contribution to enhancing student outcomes. These results align with prior research, which emphasizes the importance of fostering effective group dynamics and facilitation in achieving better academic performance. According Muttezo et al, 2018 found that effective group discussions involve cognitive, social, and teaching presence to enable constructive collaboration, which is consistent with the findings that these qualities correlate to higher performance.

These findings are consistent with earlier research that highlights the importance of successful group dynamics and unambiguous facilitation in online learning environments (Long Singleton et al, 2020). By concentrating on these elements, instructors can facilitate more interesting and effective talks, resulting in higher academic performance. As a result, the data clearly supports the hypothesis, showing that improving the elements that influence the quality of online group discussions has a considerable impact on student achievement.

5.4 Significant Contribution (Implication) of the Study

The study's conclusions make significant contribution to three major area which is body of knowledge, industry implementation, and national policy. These result highlight the role of online group discussions in enhancing the performance of undergraduate students.

5.4.1 Body of Knowledge

This study contributes greatly to our understanding of collaborative learning, online learning, and technology-enhanced learning by investigating how online group conversations affect student performance. It supports Vygotsky's sociocultural theory, which emphasizes the significance of social contact in learning, by demonstrating that online discussions allow students to share ideas, question opinions, and gain knowledge collaboratively (Vygotsky, 2019).

The study also emphasizes the unique characteristics of online group discussions, such as asynchronous communication, which allows students to participate at their own pace while encouraging deeper reflection and critical thinking. At the same time, it highlights issues such as reduced immediacy, which might affect participation, implying the need for new models that account for these dynamics.

Finally, the study illuminates how technology influences collaborative learning by highlighting the importance of platform features such as threading, real-time engagement, and multimodal communication. This paves the way for the creation of new frameworks that combine conventional learning theories with contemporary online education tools and activities.

5.4.2 Industry

This study has important consequences for higher education institutions and educational technology developers. If the study shows that online group discussions are helpful, educators may be encouraged to incorporate more of these activities into their courses. This could include teaching staff on how to create and lead online discussions, defining rubrics for assessing student

engagement, and fostering supportive online learning environments that promote cooperation (Garrison, 2018).

The study's findings can help educational technology developers construct and improve online learning systems that better promote collaborative learning through online group discussions. This may include real-time feedback systems, automated peer assessment tools, and social networking features that allow students to communicate with one another.

5.4.3 Nation

This study can inform national education strategies targeted at improving higher education by demonstrating the benefits of online learning and collaborative group discussions. If the study concludes that these strategies boost student performance, it may justify policies that promote the use of technology in education. This might include funding for the creation of online learning resources, such as digital courses and materials, so making education more accessible to a broader range of students.

Furthermore, the study could emphasize the need of preparing educators to use instructional technology efficiently. Policies might be developed to guarantee that teachers have the resources and expertise they need to design and manage engaging online courses for students.

The research also has the potential to inform the creation of ethical guidelines for online learning. As more education moves online, it's important to protect student privacy and data. The findings could help shape policies that ensure online platforms are used responsibly and that students' personal information is kept secure. These guidelines would ensure that online learning is both effective and safe for students.

5.5 Limitation of the Study

Several limitation are present in this study on the role of online group discussion in enhancing the performance of undergraduate students. First of all, respondents struggled to understand the goal of the questionnaires and needed additional time to do so. This may have had an effect on how accurately they reacted. The data was collected using a Likert scale questionnaire. Quantitative approaches offer valuable insights but have limitations. Limited interaction between researchers and respondents, causing challenges during the procedure. Researchers did not answer respondents' questions or provide direct clarifications, which could have enhanced comprehension. As a result, individuals' comments may not accurately reflect their opinions or actions.

Secondly, limitation when conducting this research was time constraint, the researcher had a limited time which was one and a half months of period to collect the data from the respondents so that the researcher could not find more responses from the respondents. The researcher had collected the data by distributing the questionnaire through Whatapps and Telegram palform. This lead to insufficient number of respondents. The number of respondents that should be obtained is as much as 370 respondents, but the researcher can only get as many as 214 respondents, which is only 57.83 percent of the 370 respondents required.

To improve the results, the study should have streamlined and pilot-tested the questionnaire using a small sample to guarantee clarity and relevance. Providing clear instructions and the possibility for responders to ask questions via dedicated help channels would have increased comprehension. Combining quantitative data with qualitative methods, such as interviews or open-ended questions, may have yielded more nuanced results. Furthermore, maintaining real-time connection between researchers and respondents, whether through virtual sessions or follow-up talks, would have cleared up any confusion and improved response accuracy. These

measures would have addressed the constraints and increased the dependability of the results.

Furthermore, the data collection period could have been extended beyond one and a half months to allow more time for reaching respondents. Expanding the distribution channels to include email, university platforms, and social media networks could have increased accessibility and participation. Collaborating with academic institutions to disseminate the survey through official channels would have enhanced credibility and reach. Additionally, offering small incentives, such as certificates or tokens of appreciation, could have encouraged more students to participate, helping to achieve the target sample size and improve data reliability.

5.6 Recommendation and Future Direction

The researcher had studied the role of online group discussion in enhancing the performance of undergraduate students. There are several recommendations that can be suggested from the researcher for the further researcher.

First of all, digital platform can encouraged the future researcher to distribute and collect their questionnaire from the respondent. The reason is because the researcher need to collect the questionnaire from student from different faculty in the short time. Future researcher will save time to make more valuable and useful findings for the role of online group discussions. By using the digital platform such as university social media or university email can help the future researcher get more data from respondent.

Future researchers are encouraged to look deeper into the function of online group discussions in improving student performance, beyond simple analyses of benefits, drawbacks, and influencing factors. They should look

into how these discussions foster critical thinking, teamwork, and leadership abilities, as well as how they affect emotional well-being and social connectivity, and how they can help to close educational inequities. Investigating cross-cultural differences, incorporating conversations with novel teaching approaches, and finding better ways to assess their impact can all provide useful insights. Such research will help to understand the larger significance of online group discussions and advise their optimal use in education.

REFERENCES

Ahmad, N., Alias, F., Hamat, M., & Mohamed, S. (2024). RELIABILITY ANALYSIS: APPLICATION OF CRONBACH'S ALPHA IN RESEARCH INSTRUMENTS. https://appspenang.uitm.edu.my/sigcs/2024-2/Articles/20244_ReliabilityAnalysis-ApplicationOfCronbachsAlphaInResearchInstruments.pdf

Aljeraisy, M., Mohammad, H., Fayyoumi, A., & Alrashideh, W. (2019). Web 2.0 in Education: the Impact of Discussion Board on Student Performance and Satisfaction. The Turkish Online Journal of Educational Technology, 14(2). https://files.eric.ed.gov/fulltext/EJ1057329.pdf

Anderson, K. (2020, September 27). Online Learning: Importance of Online Discussion Groups. ProProfs Training Blog; ProProfs. https://www.proprofstraining.com/blog/discussion-groups-in-online-training/

Arkhan. (2019, August 19). Coefficient of Determination (R-squared) - Definition, Formula & Properties. BYJUS; BYJU'S. https://byjus.com/maths/coefficient-of-determination/

Bansal, R., & Nishita Pruthi. (2023, January 30). A Systematic Literature Review on Student Engagement in Online Learning Amid COVID-19. ResearchGate; unknown. https://www.researchgate.net/publication/367542411_A_Systematic_Literature_Review_on_Student_Engagement_in_Online_Learning_Amid_COVID-19

Barks, A. (2021, July 22). How to conduct a one-on-one interview: Advantages, questions to ask, and traits to look for. The Predictive Index. https://www.predictiveindex.com/blog/how-to-conduct-a-one-on-one-interview-advantages-questions-to-ask-and-traits-to-look-for/

Beena Vijayavalsalan. (2018, April 2). Students' Impressions on the Effectiveness of Online Discussion Forums. ResearchGate; OpenEd Network. https://www.researchgate.net/publication/341471951_Students'_Impressions_on _the_Effectiveness_of_Online_Discussion_Forums

Bevans, R. (2020, January 31). An Introduction to t Tests | Definitions, Formula and Examples. Scribbr. https://www.scribbr.com/statistics/t-test/

Bhandari, P. (2021, July 7). Correlational Research | When & How to Use. Scribbr. https://www.scribbr.com/methodology/correlational-research/#:~:text=A%20correlational%20research%20design%20investigates,be %20either%20positive%20or%20negative.

Calderon, O., & Sood, C. (2020). Evaluating learning outcomes of an asynchronous online discussion assignment: a post-priori content analysis. Interactive Learning Environments, 28(1), 3-17.

Cecilia Maria Patino, & Juliana Carvalho Ferreira. (2020). Internal and external validity: can you apply research study results to your patients? Jornal Brasileiro de Pneumologia, 44(3), 183–183. https://doi.org/10.1590/s1806-37562018000000164

Clark, T. (2020). Disadvantages of collaborative online discussion and the advantages of sociability, fun, and cliques for... ResearchGate; unknown. https://www.researchgate.net/publication/234783804_Disadvantages_of_collabo rative_online_discussion_and_the_advantages_of_sociability_fun_and_cliques_ for_online_learning

DeFranzo, S. E. (2020, November 16). Advantages and Disadvantages of Surveys. SnapSurveys Blog. https://www.snapsurveys.com/blog/advantages-disadvantages-surveys/

Du, Z., Wang, F., Wang, S., & Xiao, X. (2022). Enhancing Learner Participation in Online Discussion Forums in Massive Open Online Courses: The Role of Mandatory Participation. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.819640

Feldman, K. (2022, September 23). F-value (ANOVA): Get the Most Out of Your Data Analysis. Isixsigma.com. https://www.isixsigma.com/dictionary/f-value-anova/

Fernando, J. (2024). The Correlation Coefficient: What It Is and What It Tells Investors. Investopedia. https://www.investopedia.com/terms/c/correlationcoefficient.asp

Gasmi, A. A. (2022). Through the Lens of Students: How Online Discussion Forums Affect Students' Learning. International Journal of Technology in Education, 5(4), 669–684. https://doi.org/10.46328/ijte.291

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. The Internet and higher education, 3(2-3), 87-105. https://www.researchgate.net/profile/D-Garrison/publication/284740159_Communities_of_Inquiry_in_Online_Learnin g/links/5a7dfc964585154d57d4ebfc/Communities-of-Inquiry-in-Online-Learning.pdf

Gupta, N. (2023, January 30). Introduction When it comes to job interviews, there are two main options: face-to-face and online. Each method has its advantages and disadvantages, and the choice between them will depend on various factors, such as the nature of the job, the preferences of the employer and the candidate, and the c. Linkedin.com. https://www.linkedin.com/pulse/pros-cons-face-to-face-online-interviews-neeraj-gupta#:~:text=While%20face%2Dto%2Dface%20interviews,nervousness%20in %20a%20formal%20setting.

Green, J. L., Manski, S. E., Hansen, T. A., & Broatch, J. E. (2022). Descriptive statistics. Elsevier EBooks, 723–733. https://doi.org/10.1016/b978-0-12-818630-5.10083-1

H Karan Kumar. (2023, April 6). Importance of Group Discussions | IILM Blog. The IILM Blog. https://blog.iilm.edu/importance-of-group-discussions/

Hartiwi Prabowo, Ridho Bramulya Ikhsan, & Yuniarty Yuniarty. (2022). Student performance in online learning higher education: A preliminary research. Frontiers in Education, 7. https://doi.org/10.3389/feduc.2022.916721

Hanadi Hamadi, Tafili, A., Kates, F. R., Larson, S. A., Ellison, C., & Song, J. (2023). Exploring an Innovative Approach to Enhance Discussion Board Engagement. TechTrends, 67(4), 741–751. https://doi.org/10.1007/s11528-023-00850-0

Hassan, Z. A., Schattner, P., & Mazza, D. (2018). Doing A Pilot Study: Why Is It Essential? Malaysian Family Physician : The Official Journal of the Academy of Family Physicians of Malaysia, 1(2-3), 70. https://pmc.ncbi.nlm.nih.gov/articles/PMC4453116/

Jones, J. M. (2021). Discussion Group Effectiveness is Related to Critical Thinking through Interest and Engagement - Janelle M. Jones, 2014. Psychology Learning & Teaching. https://journals.sagepub.com/doi/10.2304/plat.2014.13.1.12

Joon Choi, B., & Sik Kim, H. (2019). The impact of outcome quality, interaction quality, and peer-to-peer quality on customer satisfaction with a hospital service. Managing Service Quality: An International Journal, 23(3), 188-204.

Kaspars Kalkis. (2022, October 31). t-Tests Explained: t-Values and t-Distributions. Scandiweb. https://scandiweb.com/blog/t-tests-explained/

Kallner, A. (2018). Formulas. Elsevier EBooks, 1–140. https://doi.org/10.1016/b978-0-12-814348-3.00001-0

Kedia, P., & Mishra, L. (2022). Exploring the factors influencing the effectiveness of online learning: A study on college students. Social Sciences & Humanities Open, 8(1), 100559–100559. https://doi.org/10.1016/j.ssaho.2023.100559

Koksal, K. (2023). Examination of online group discussions in terms of intrinsic motivation, social presence, and perceived learning - Hakan Kilinc, Koksal Buyuk, 2023. E-Learning and Digital Media. https://journals.sagepub.com/doi/10.1177/20427530221108539

Levy, S. (2019, June 22). Virtual Debate: 7 Advantages of Online Discussions. Busy Teacher. https://busyteacher.org/22680-virtual-debate-online-discussions-7-advantages.html

Lu, H., & Smiles, R. (2022). The Role of Collaborative Learning in the Online Education. International Journal of Economics, Business and Management Research, 06(06), 125–137. https://doi.org/10.51505/ijebmr.2022.6608

Maèva Flayelle, Brevers, D., & Joël Billieux. (2022). The advantages and downsides of online focus groups for conducting research on addictive online behaviours. Addiction, 117(8), 2142–2144. https://doi.org/10.1111/add.15944

Mao, L., & Queiroz, F. (2024). Online education in design disciplines: factors influencing the interactive experience of group learning. International Journal of Technology and Design Education. https://doi.org/10.1007/s10798-024-09882-w

McCombes, S. (2019, September 19). Sampling Methods | Types, Techniques & Examples. Scribbr. https://www.scribbr.com/methodology/sampling-methods/ Research Design and Research Methods. (n.d.). https://us.sagepub.com/sites/default/files/upm-binaries/57848_Chapter_3_Morgan_Integrating_Qualitative_and_Quantitative_Methods_2.pdf

Mesfin Tadese, Yeshaneh, A., & Getaneh Baye Mulu. (2022). Determinants of good academic performance among university students in Ethiopia: a cross-sectional study. BMC Medical Education, 22(1). https://doi.org/10.1186/s12909-022-03461-0

Middleton, F. (2019, July 3). Reliability vs. Validity in Research | Difference, Types and Examples. Scribbr. https://www.scribbr.com/methodology/reliability-vs-validity/

Mogea, T. (2021). Enhancing Students' Speaking Ability Through Small Group Discussion Technique to the First Year Students of SMA Negeri 1 Ratahan. Journal of Educational Method and Technology, 2(3). https://doi.org/10.36412/jemtec.v2i3.1022

Mutezo, A. T., & Maré, S. (2018). Teaching and cognitive presences: The mediating effect of social presence in a developing world context. Cogent Education, 10(1). https://doi.org/10.1080/2331186x.2023.2171176

Ngendahayo. (2019) IMPORTANCE OF GROUP DISCUSSION TO STUDENT PERFORMANCE.SlideShare; Slideshare. https://www.slideshare.net/slideshow/importance-of-group-discussion-to-student-performance/83355252

Northover, M. (2020). ONLINE DISCUSSION BOARDS -FRIEND OR FOE? https://www.ascilite.org/conferences/auckland02/proceedings/papers/193.pdf

Nor Fariza, Nor, M., Razak, N. A., & Aziz, J. (2019). E-learning: Analysis of online discussion forums in promoting knowledge construction through collaborative learning. WSEAS TRANSACTIONS on COMMUNICATIONS, 9(1). https://www.researchgate.net/publication/228946206_E-learning_Analysis_of_online_discussion_forums_in_promoting_knowledge_construction_through_collaborative_learning

O.Nyumba, T., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. Methods in Ecology and Evolution, 9(1), 20–32. https://doi.org/10.1111/2041-210x.12860

Puri, G. (2018, April 13). What is A Group Discussion- Definition, Types, and Process. Naukri's Official Blog; Naukri's Official Blog. https://www.naukri.com/blog/what-is-group-discussion/

Rahiem, M. (2020). Technological barriers and challenges in the use of ICT during the COVID-19 emergency remote learning. Figshare. https://doi.org/%22,

Razali, S., Shahbodin, F., Hussin, H., & Bakar, N. (n.d.). Factors That Affecting The Effective Online Collaborative Learning Environment. Retrieved June 6, 2024, from

https://eprints.utem.edu.my/id/eprint/13774/1/Factors_That_Affecting_Effective _Online_Project_Based_Collaborative_Learning_Environment.pdf

Samar Mohammed Alharbi, Abdellah Elfeky, & Sultan, E. (2022, June 5). The Effect Of E-Collaborative Learning Environment On the Development Of Critical Thinking And Higher Order... ResearchGate; unknown. https://www.researchgate.net/publication/368237806_The_Effect_Of_E-Collaborative_Learning_Environment_On_Development_Of_Critical_Thinking _And_Higher_Order_Thinking_Skills

Schneider, A. (2022, March 30). 5 Online Discussion Benefits to Improve Your Student's Thinking- schnaq. Schnaq Bloq. https://schnaq.com/blog/en/online-discussion-benefits/

Semiyu Adejare Aderibigbe. (2020). Online Discussions as an Intervention for Strengthening Students' Engagement in General Education. Journal of Open Innovation, 6(4), 98–98. https://doi.org/10.3390/joitmc6040098

Samuel, A. (2019). Research Design and Methodology Week 6. http://samuellearning.org/MSc_Research_Methods/Week_6_ResearchMethodol ogy.pdf

Semiyu Adejare Aderibigbe. (2021). Can online discussions facilitate deep learning for students in General Education? Heliyon, 7(3), e06414–e06414. https://doi.org/10.1016/j.heliyon.2021.e06414

Shakespeare, V. (2023, July 12). What is Pilot Testing? - Fuel Cycle. Fuel Cycle. https://fuelcycle.com/blog/pilot-testing-how-it-can-improve-research/

Stansfield, M., Mclellan, E., & Connolly, T. (2019). Enhancing Student Performance in Online Learning and Traditional Face-to-Face Class Delivery. Journal of Information Technology Education: Research, 3, 173–188. https://doi.org/10.28945/296

Sigal Kordova, & Hirschprung, R. S. (2023). Effectiveness of the forced usage of alternative digital platforms during the COVID-19 pandemic in project communication management. Heliyon, 9(11), e21812–e21812. https://doi.org/10.1016/j.heliyon.2023.e21812

Sutha Sundram et al (2023). A Pilot Study to Test the Reliability and Validity of The Research Instrument. https://msocialsciences.com/index.php/mjssh/article/download/2149/1522/

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2020). Improving online learning: Student perceptions of useful and challenging characteristics. The Internet and Higher Education, 7(1), 59–70. https://doi.org/10.1016/j.iheduc.2003.11.003

Taylor, S. (2023, November 21). Correlation. Corporate Finance Institute. https://corporatefinanceinstitute.com/resources/data-science/correlation/

The process of research design. (2024). ResearchGate; ResearchGate. https://www.researchgate.net/figure/The-process-of-research-design_fig1_377694900

Tiene, D. (2019). Online Discussions: A Survey of Advantages and Disadvantages Compared to Face-to-Face Discussions. Journal of Educational Multimedia and Hypermedia, 9(4), 371–371. https://go.gale.com/ps/i.do?id=GALE%7CA72890608&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=10558896&p=AONE&sw=w&userGroupName=anon%7Ee54c170&aty=open-web-entry

Turner, D. P. (2020). Sampling Methods in Research Design. Headache, 60(1), 8–12. https://doi.org/10.1111/head.13707

Vedantu. (2020, August 8). F Test Formula. VEDANTU; Vedantu. https://www.vedantu.com/formula/f-test-formula

Villarreal, P., Peñabaena-Niebles, R., & Correa, C. B. (2020). Influence of environmental conditions on students' learning processes: A systematic review. Building and Environment, 231, 110051–110051. https://doi.org/10.1016/j.buildenv.2023.110051

Vijay Kanade. (2018, April 7). What is Linear Regression?- Spiceworks. Spiceworks Inc; Spiceworks. https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-linear-regression/

Vygotsky, L. S. (2019). Mind in society: The development of higher psychological processes. Harvard University Press. https://www.hup.harvard.edu/books/9780674576292

Walther, J. B. (2021). Language, Psychology, and New New Media: The Hyperpersonal Model of Mediated Communication at Twenty-Five Years - Joseph B. Walther, Monica T. Whitty, 2021. Journal of Language and Social Psychology. https://journals.sagepub.com/doi/10.1177/0261927X20967703

Wang, Y.-M. (2019). Enhancing the Quality of Online Discussion—Assessment Matters - Yu-Mei Wang, 2019. Journal of Educational Technology Systems. https://journals.sagepub.com/doi/full/10.1177/0047239519861416

Wu, H., Bai, S., Liao, Y., & Tan, C. (2024, January 15). The Academic Performance and Upward Mobility of Students in Education Program. ResearchGate; Al-Kindi Center for Research and Development. https://www.researchgate.net/publication/377432638_The_Academic_Performance_and_Upward_Mobility_of_Students_in_Education_Program

Yarilet Perez. (2024). R-Squared: Definition, Calculation, and Interpretation. Investopedia. https://www.investopedia.com/terms/r/r-squared.asp

APPENDIX

1. **Survey Questionnaire**

SECTION A: Demographic

1. Gender
   - Male
   - Female

2. Race
   - Malay
   - Chinese
   - Indian
   - Other:

3. Faculty
   - Faculty of Electronics and Computer Technology and Engineering
   - Faculty of Electrical Technology and Engineering
   - Faculty of Mechanical Technology and Engineering
   - Faculty of Industrial and Manufacturing Technology and Engineering
   - Faculty of Information and Communications Technology
   - Faculty of Technology Management and Technopreneurship

4. Year of study
   - Year 1
   - Year 2
   - Year 3
   - Year 4

5. Familiarity with making online group discussion

- Familiar
- Not familiar

SECTION B: IV1- Benefits of Online Group Discussion

1	2	3	4	5
Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree

Items	Question	1	2	3	4	5
1	It will increase participation for better decision-making.					
2	It is easier to voice your opinion.					
3	It can encourage interesting idea-sharing					
4	It helps introvert (shy) students to participate.					

SECTION C: IV2-Disadvantages of Online Group Discussion

1	2	3	4	5
Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree

Items	Question	1	2	3	4	5
1	It is harder to see someone's feeling if there is no camera.					
2	The amount of information may not be accurate (trustworthy)					

| 3 | The online connection may face technical issues. | | | | | |
| 4 | The participant may be distracted by their surroundings. | | | | | |

SECTION D: IV3-Factors Influencing Effective Online Group Discussion

1	2	3	4	5
Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree

Items	Questions	1	2	3	4	5
1	A suitable online platform will enable a smooth discussion.					
2	A moderator can help running an effective discussion.					
3	Clear goals may improve participation in online discussions.					
4	Participant prior knowledge can make online discussion lively.					

SECTION E: DV- Enhancing Student Performance Through Online Group Discussion.

1	2	3	4	5
Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree

Items	Question	1	2	3	4	5
1	Students can develop critical thinking.					
2	Students communication skills can be enhanced.					
3	Students can improve their teamwork.					
4	Student feel more open to involve in discussion.					
5	Students may also use online platforms for research.					
6	Student can be more confident to express their ideas					

2. Gantt Chart Final Year Project

2.1 Final Year Project 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Confirm and ensure that the topic meets the faculty's requirements	█														
Submit a topic proposal form	█														
Topic correction	█														
Send the topic proposal form to the supervisor	█														
Chapter 1 lecture and writing		█	█	█											
Chapter 2 lecture and writing			█	█	█	█									
Submit the topic verification form				█											
Chapter 3 lecture and writing					█	█									
Submit PSM Chapter 1 and 2 reports						█									
Chapter 1, 2, and 3 submission							█								
Prepare presentation slides								█							
Finished checking the report									█						
Slide correction										█					
Send softcopy and video to the supervisor										█					
Discussion on presentation preparation											█				
Presentation of FYP 1											█				

2.2 Final Year Project 2

Task/ Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Confirm survey questionnaires	■														
Collect data		■	■	■	■	■									
Discuss 4 and 5				■											
Attend SPSS training					■										
Write Chapter 4				■	■	■	■	■							
Write Chapter 5						■	■	■							
Submit the full draft of Chapters 1 to 5									■	■					
Standby for Viva presentation											■	■			