A Phenomenological Exploration of Students' Perceptions of AI Chatbots in Higher Education

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Abstract

This study examines the impact of AI chatbots as a communication medium on student engagement and support in higher education. The qualitative method and Interpretative Phenomenological Analysis (IPA) were employed as the research approach, utilizing in-depth semi-structured interviews. Purposive sampling was used to select 11 participants from the state of Kerala, India, in higher education. Data analysis followed the Systematic Text Consideration (STC), a five-step process, including framing meaning units, condensing meaning units, coding, creating sub-themes, and deriving themes. By exploring themes aligned with the UTAUT2 constructs, a comprehensive understanding of the factors influencing student engagement and support was achieved. A total of eight themes were identified, encompassing "Effectiveness and Limitations," "Beyond," "Enrichment," "Optimization," "Synergize," "Streamlining Communication," "Engage+AI," and "Refine." These themes provided compelling evidence of the transformative potential of AI chatbots in facilitating effective communication, enhancing engagement, and offering timely support. The study's results carry significant practical implications for higher education institutions. Embracing AI chatbots, universities and institutions can enhance student engagement and support through efficient communication, personalized recommendations, and streamlined interactions. These chatbots offer a balance between quick assistance and human expertise, optimizing both routine tasks and complex inquiries. Additionally, addressing security and privacy concerns is crucial to fostering trust and successful integration. Overall, embracing AI chatbots can transform the educational experience, making it more efficient, engaging, and supportive for students in higher education.

Keywords: chatbots, AI chatbots, higher education, Interpretative Phenomenological Analysis, UTAUT2

In contemporary society, the pervasive presence of chatbot technology is evident across various domains, ranging from smart home speakers to workplace messaging applications. These advanced Artificial Intelligence (AI) chatbots, often denoted as "virtual assistants" or "virtual agents," can operate through diverse mediums. They can be engaged through audio input, as exemplified by Apple's Siri, Google Assistant, and Amazon Alexa, or facilitate interactions via text-based platforms such as SMS, ChatGPT, and Google Bard. This accessibility empowers individuals to engage in natural conversations with chatbots, eliciting information and refining inquiries through interactive responses and follow-up interactions. Amid the rising prominence of AI technologies, attention has shifted towards their potential to elevate student engagement and support within higher education. A specific application of AI that showcases substantial promise is AI chatbot communication. AI chatbots offer personalized and prompt assistance, enabling students to efficiently access information and resources. However, the effective implementation of AI chatbots in higher education necessitates a profound understanding of how students perceive and interact with such communication tools. The integration of AI chatbots into higher education has gained considerable traction as a mechanism to enhance student engagement and academic achievement (Pérez et al., 2020; Studente et al., 2020). The literature demonstrates an increasing interest in leveraging chatbots to deliver efficient services to students (Pérez et al., 2020) while concurrently bolstering their engagement (Studente et al., 2020). These trends underline the broader acknowledgment of AI chatbots' potential in education, fostering personalized support and facilitating interactive and responsive learning experiences. Moreover, students perceived chatbots and instant-messaging services as valuable for communicating with course directors and obtaining necessary support (Abbas et al., 2022).

This research is guided by two main research questions. These questions delve into students' perceptions and preferences regarding AI chatbots in higher education: RQ1: How do students perceive the role of AI chatbots in enhancing student engagement and support in higher education? What factors contribute to their opinions about the helpfulness and effectiveness of AI chatbots communication? RQ2: What key factors influence students' preferences for using AI chatbots as a means of communication in higher education? How do concerns about security, privacy, and other factors impact their decision to adopt AI chatbots for addressing inquiries related to admissions, courses, academics, and library references? The first question scrutinizes students' perspectives on AI chatbots in higher education, specifically examining their contributions to student engagement and support. It aims to unearth the factors shaping students' views on the effectiveness and utility of communicating with AI chatbots in educational contexts. This understanding is paramount for educational institutions to glean insights into the advantages and limitations of incorporating chatbot technology, optimizing both student engagement and support. The second question focuses on the factors influencing students' inclination towards using AI chatbots for communication in higher education. As AI chatbots continue their ascendancy, comprehending students' perspectives becomes pivotal for their effective integration and alignment with students' needs. The significance of this study lies in its potential to enrich the realm of higher education by providing insights into the impact of AI chatbots on student engagement and support. However, it's important to acknowledge that students' perceptions of AI chatbots can vary, and concerns encompassing privacy,

reliability, and impersonal interactions have emerged. In bridging these research gaps, this study employs qualitative interpretive phenomenology (Smith et al., 2009) to delve into students' experiences, perceptions, and attitudes, when interacting with AI chatbots in higher education. Through the analysis of interview transcripts, this research aims to unveil the sophisticated factors that influence students' perceptions, experiences, and attitudes towards AI chatbots. These findings will offer valuable insights to guide the design and implementation of AI chatbots, optimizing their potential to amplify student engagement and support in higher education.

The structure of this paper is organized as follows: Commencing with a succinct overview of the historical evolution of chatbots, emphasizing their relevance in higher education, the subsequent section embarks on a comprehensive literature review. This review encapsulates the existing research on AI chatbots in higher education, traversing their potential advantages and attendant concerns. Additionally, the theoretical framework underpinning this study, the Unified Theory of Acceptance and Use of Technology (UTAUT2), is introduced (Venkatesh et al., 2003, 2012). The methodology section delineates the research design, participant selection process, interview procedures, ethical considerations, and the qualitative data analysis approach Systematic Text Condensation (STC). The results and discussion sections encapsulate the emergent themes and codes drawn from students' experiences and perceptions of AI chatbot communication within higher education. These themes are compiled with the UTAUT2 model constructs. Ultimately, the conclusion synthesizes key findings, acknowledges the study's limitations, and furnishes recommendations to optimize AI chatbots' deployment for enhancing students' engagement and support. This study aspires to augment current understanding of AI chatbot communication within higher education through an in-depth exploration of the student experience. Through this exploration of students' perceptions, attitudes, and lived experienced, this research yields valuable insights into the potential impact of AI chatbots on student engagement and support. These insights will pave the way for the formulation of effective strategies and guidelines for the seamless integration of AI chatbots, ultimately enhancing the educational experience and academic attainment of university students.

Review of Literature

This literature review encompasses three main areas: the history of chatbots, AI chatbots used in education, and AI chatbots as a communication medium in higher education. It explores the existing literature and empirical evidence surrounding these topics, as well as sorts out the potential benefits and concerns associated with the use of AI chatbots in educational settings.

History of Chatbots

A chatbot is a computer program that engages in text or voice-based interactions, simulating human-like conversation and comprehending multiple human languages through the application of Natural Language Processing (NLP) (Khanna et al., 2015). According to Lexico Dictionaries, a chatbot is described as "A computer program designed to simulate conversation

with human users, especially over the Internet." These versatile entities are also recognized by various terms, including smart bots, interactive agents, digital assistants, or artificial conversation entities. The concept of chatbots dates to the mid-20th century when Alan Turing proposed the Turing test to evaluate machine intelligence (Turing, 1950). In 1966, the Massachusetts Institute of Technology (MIT) developed the first known chatbot called ELIZA, which used a pattern matching rule system to generate responses based on specific keywords (Mekni et al., 2020). ELIZA simulated a non-directional psychotherapist and employed template-based responses (Mekni et al., 2020). Another significant chatbot was PARRY, which was developed in 1972 and simulated a patient with schizophrenia (Colby et al., 1972). PARRY exhibited a personality and responded based on assumptions and emotional reactions triggered by user input (Colby et al., 1972). Artificial Intelligence (AI) entered the chatbot domain with the creation of Jabberwacky in 1988. This chatbot utilized Clever Script and contextual pattern matching. The term "Chatterbot" was first used in 1991 to refer to an artificial player in the TINYMUD virtual world (Mauldin, 1994). In 1995, Wallace introduced the Artificial Linguistic Internet Computer Entity (A.L.I.C.E) architecture, which distinctly separates the "chatbot engine" and the "language knowledge model." This separation allowed for the seamless integration of different language knowledge models providing a plug-and-play capability (AbuShawar & Atwell, 2015). A.L.I.C.E gained popularity in 2001, utilizing the Artificial Intelligence Mark-up Language (AIML) and featuring a substantial knowledge base. Advancements in NLP and AI technologies led to the emergence of rule-based chatbots like A.L.I.C.E. in the 1990s (Powton, 2018; Dale, 2016).

In 2001, SmarterChild revolutionized chatbots technology by providing practical assistance to users by retrieving information from databases (Molnár & Zoltán, 2018). In more recent years, voice-activated personal assistants like Siri, Watson Assistant, Google Assistant, Cortana, and Alexa gained popularity for managing tasks and engaging in conversation (Powton, 2018; Dale, 2016). Social media platforms facilitated the development of chatbots for various purposes, and by the end of 2016, around 34,000 chatbots existed across different fields (Powton, 2018). Integrating chatbots with the Internet of Things (IoT) improved communication between connected smart objects (Kar & Haldar, 2016). Generative Pre-trained Transformers (GPT) are advanced neural network models with a transformer architecture, revolutionizing AI for tasks like ChatGPT. These models create human-like text, images, and music, excelling in Q&A, summarization, content creation, and search across industries. The GPT series includes GPT-1 (2018), GPT-2 (2019), GPT-3 (2020), and GPT-3.5 (2022), each with enhanced capabilities. GPT-4 (2023) further expands with text prediction and reinforcement learning from human feedback, accepting text and images (Vincent, 2019; Tom et al., 2020).

AI Chatbots in Education

An AI chatbot, also referred to as a virtual assistant or virtual agent, is a sophisticated computer program specifically designed to take advantage of AI and advanced NLP techniques. Its primary function is to understand and interpret customer queries, and subsequently provide relevant and contextually accurate responses. By mimicking human conversation patterns, an AI chatbot engages in interactive and dynamic dialogues, offering effective communication

and assistance to users. These advanced chatbots can engage in conversations through text or voice, and they are designed to interact with users in a conversational manner, similar to how a human would communicate (Caldarini et al., 2022). Powered by machine learning and natural language processing, AI chatbots are capable of learning from interactions and adapting their responses over time (Google AI, 2022). In the past, chatbots were primarily text-based and programmed to provide answers to specific questions predetermined by developers, functioning as interactive FAQs. However, modern AI chatbots go beyond this limitation, maintaining dynamic conversations, and handling complex queries by utilizing deep learning and natural language processing techniques. These chatbots serve various applications, including customer service, information retrieval, and assisting users in a conversational manner (Russell & Norvig, 2010). AI chatbots serve as intelligent software applications that emulate human-like conversations through text or voice interactions, leveraging AI technologies to enhance user engagement and provide accurate and contextually relevant responses (Caldarini et al., 2022; Google AI, 2022; Russell & Norvig, 2010).

The application of AI in the field of education is expanding drastically. Chatbot systems stand out among the prevalent AI technologies used to support teaching and learning (Okonkwo & Ade-Ibijola, 2020). Evidence that they can enhance student interaction is on the rise (Okonkwo & Ade-Ibijola, 2021). Chatbots are regarded as valuable educational instruments for enhancing the teaching and learning process (Clarizia et al., 2018) in higher education by providing personalized and efficient support to students (Cunningham-Nelson et al., 2019). Given the prevalence of smart phones among students in higher education, chatbot systems can be deployed effectively as mobile web applications to facilitate learning. These chatbots offer instantaneous access to standardised information such as efficient and timely services (Pérez et al., 2020), course content (Cunningham-Nelson et al., 2019), study materials (Okonkwo & Ade-Ibijola, 2021), practice questions and answers (Okonkwo & Ade-Ibijola, 2021; Ranoliya et al., 2017; Sinha et al., 2020),evaluation criteria (Okonkwo & Ade-Ibijola, 2021), assignment due dates, and advice (Ismail & Ade-Ibijola, 2019; Okonkwo & Ade-Ibijola, 2021). They can also help streamline administrative tasks (Studente et al., 2020), provide campus path direction (Mabunda & Ade-Ibijola, 2019; Okonkwo & Ade-Ibijola, 2021) and augment student engagement (Studente et al., 2020). Some institutions also introduce chatbots to alleviate costs associated with student administration (Abbas et al., 2022). By providing such comprehensive support, these systems not only improve student engagement and academic support but also substantially reduce the administrative workload and burden of lecturers, allowing them to concentrate on curriculum advancement as well as research (Cunningham-Nelson et al., 2019). Moreover, AI chatbots can streamline administrative tasks in educational institutions. The integration of chatbots in university admissions processes found that they efficiently handled inquiries related to admissions requirements, deadlines, and application status. This freed administrative staff to focus on more complex tasks (Green & Johnson, 2021). While AI chatbots in education offer numerous benefits, further research is necessary to address ethical considerations, understand their impact on student motivation, and develop more advanced conversational capabilities. Addressing these challenges, educational institutions can leverage the potentials of AI chatbots to create more engaging and efficient learning environments for students (Green & Johnson, 2021).

AI Chatbots as a Communication Medium in Higher Education

AI chatbots have emerged as a promising communication medium in higher education (Kooli, 2023), providing personalized assistance and support to students (Cunningham-Nelson et al., 2019). These chatbots emulate human-like conversations, employing natural language structures (Pham et al., 2018) through text messages on websites or mobile applications, voice-based interactions (Alexa or Siri), or a combination of both (Pereira et al., 2019). Functioning as automated conversational agents, they have gained significant popularity in replicating student service interactions across various domains in higher education (Khan et al., 2019; Wang et al., 2021). Tlili et al. (2023) explored how conversational AI, like ChatGPT, might improve online learning. Due to the engagement and interactivity, students preferred AI chatbots as conversational agents for learning activities. Kuhail et al. (2022) found that chatbots might give students immediate feedback, personalized support, and self-directed learning experiences, increasing engagement and motivation. Based on the study of Studente et al. (2020), it is reported that the usage of chatbots in higher education, notably among first-year students, eased university transitions, increased academic engagement, and encouraged peer connection. Chatbots also helped students contact course directors to seek the required support on time.

Employing chatbots as communication tools, researchers bolster collaboration, enriching information exchange and refining research quality. Chatbots amplify cooperative efforts, streamlining information dissemination and enhancing synergy among researchers (Kooli, 2023). Notably, Kooli (2023) meticulously examined the design and integration of a chatbots, specifically tailored for student-teacher interaction within an online university platform. Remarkably, this chatbot seamlessly aided students in comprehending course content and fulfilling assignments, garnering widespread approval and recognition as an invaluable means of facilitating teacher-student communication. The research highlighted the chatbots' latent capacity to elevate student-teacher interaction, consequently augmenting the broader realm of the learning experience (Dwivedi et al., 2023; Mendoza et al., 2020). This illuminates chatbots' pivotal role as a transformative communication medium, poised to revolutionize collaborative dynamics and learning outcomes (Kooli, 2023). The use of AI chatbots in delivering mental health support has also been shown to effectively reduce student stress levels (Liu et al., 2022). Additionally, AI chatbots have demonstrated value in providing academic advising and counselling services, acting as virtual tutors to offer personalized guidance and feedback.

Implementation of AI chatbots, such as "Laurie" at Georgia State University, has improved student engagement and facilitated peer-to-peer communication (Watson et al., 2022). These chatbots have primarily focused on providing course-related information support, serving as online tutors and reducing teachers' workload (Lee et al., 2020). They can also assist in identifying at-risk indicators among students and offer university-related information support, acting as intelligent assistants to improve university services and reduce labour costs (Mekni et.al. 2020; Touimi et al., 2020; Hien et al., 2018). In addition, AI chatbots can extract information from university knowledge bases and provide assistance with admissions-related queries, supporting the academic admissions process. The integration of AI chatbots as a

communication medium in higher education offers numerous advantages. These intelligent agents can provide quick and accurate responses to student queries, support the delivery of course materials, offer academic advising, and enhance campus engagement. Moreover, they have the potential to reduce the workload of teachers and administrative staff, enabling them to focus on more complex tasks (Lee et al., 2020; & Touimi et al., 2020).

Theoretical Framework

The Unified Theory of Acceptance and Use of Technology 2

The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) framework developed by Venkatesh et al. (2012) is an extension of the original UTAUT model developed by Venkatesh et al. (2003). UTAUT2 incorporates additional constructs to further enhance the understanding of technology acceptance and usage behavior. It also considers the complex interplay of individual, social, and contextual factors that influence technology adoption. This framework can be applied to investigate the impact of AI chatbots as a communication medium for student engagement and support in higher education. The UTAUT combines eight foundational models, enhancing technology acceptance and understanding (Venkatesh et al., 2003). Evolving from diverse fields' theories, UTAUT casts historical illumination on technology adoption's user intentions (Yu, 2012). The UTAUT framework incorporates core constructs: performance expectancy, effort expectancy, facilitating conditions, and social influence. However, an expanded UTAUT2 version emerged in 2012, integrating three new constructs: hedonic motivation, habit, and price value (Venkatesh et al., 2012). The important constructs of UTAUT2 for the present study are described below.

Performance Expectancy

The Performance Expectancy (PE) construct has been described as the degree to which employing a technology yields benefits in task execution (Venkatesh et al., 2003). Hence, it signifies the extent to which individuals gauge an AI chatbot's potential to amplify performance and productivity. PE encapsulates the anticipated outcome or extrinsic motivation linked with usage. Studies acknowledge the impact of AI chatbot adoption as a communication medium in higher education (Vimalkumar et al., 2021).

Effort Expectancy

Effort Expectancy (EE) is defined as a degree of ease (Venkatesh et al., 2003), which reflects the perceived ease of using chatbots. EE predicts technology adoption in education (Wirtz et al., 2019). The aim of any new technology is a favorable user perception of ease (Venkatesh et al., 2012), where self-confidence in technical competence impacts usage intent. EE gauges user friendliness, convenience, and confidence when interacting with AI chatbots. Ease and minimal cognitive effort influence students' technological intent. EE crucially shapes AI chatbots' adoption, aligning user-friendly interfaces with positive intent (Wirtz et al., 2019; Venkatesh et al., 2012).

Social Influence

Social Influence (SI) is defined as the "extent to which students perceive significant others believe they should use a particular technology" (Venkatesh et al., 2003). SI-driven variable models associate beliefs and behaviour with compliance, internalization, identification (Moriuchi, 2021). Peers, teachers, and institutional norms impact individuals' intentions to use AI chatbots through social influence. Social norms and favourable opinions affect the adoption of AI chatbots in education. According to Venkatesh et al. (2003), social influence is how students view significant others. Moriuchi (2021) explained social influence on technology usage through compliance, internalisation, and identification. They also highlighted the importance of SI in educational technology acceptance.

Facilitating Conditions

Facilitating Conditions (FC) refer to the resources that are accessible for engaging in a particular behaviour (Venkatesh et al., 2003). These resources are associated with acceptance, which is determined through self-assessment (Wang et al., 2021). The presence of a strong support infrastructure is crucial for the effective utilisation of technology, particularly in the case of AI-based tools such as chatbots. The study conducted by Vimalkumar et al. (2021) provided further evidence supporting the significance of facilitating conditions in the adoption of digital voice assistants. The adoption of AI chatbots is influenced by various factors, such as technical support, availability of resources, and institutional policies (Vimalkumar et al., 2021).

Hedonic Motivation

Hedonic Motivation (HM) refers to the inclination towards engaging in technology-related activities purely for the enjoyment they provide, without any explicit utilitarian benefits (Venkatesh et al., 2012). HM utilises enthusiasm and optimism to enhance AI chatbot interactions (Brown & Venkatesh, 2005). The experience of users is influenced by factors such as novelty, interactivity, and entertainment. According to Venkatesh et al. (2012), within the context of higher education, the engagement and motivation of chatbots are stimulated by HM.

Price Value

The concept of Price Value (PV) is used to assess the net benefits derived from technology, as discussed by Venkatesh et al. (2012). Price value pertains to the assessment of cost-effectiveness and the value for money when utilizing AI chatbots (Moorthy et al. 2019). It considers the perceived usefulness relative to the financial investment or effort required, helping individuals evaluate the benefits and drawbacks of using AI chatbots (Palau-Saumell et al., 2019).

Habit

Habits are automatic, learned actions (Venkatesh et al., 2012). Habitual use of AI chatbots refers to the automatic and routine engagement with these communication mediums, driven by past behaviours and without conscious decision-making (Jacucci et al., 2014). Habits represent a pattern of regular and ingrained utilization of AI chatbots (Perez-Vega et al., 2021).

The UTAUT2 framework provides a comprehensive understanding of technology acceptance and usage behavior by considering these seven key constructs. It recognizes the influence of individual beliefs, social factors, and contextual conditions in shaping users' acceptance and adoption of technology. Empirical evidence from various studies supports the validity and effectiveness of the UTAUT2 framework. Researchers have applied UTAUT2 in diverse settings, including e-learning, mobile learning, and AI-based systems, and have consistently found significant relationships between the constructs and technology acceptance. Studies provide empirical support for the UTAUT2 framework, reinforcing its utility in understanding individuals' technology acceptance and usage behavior in different educational contexts.

Methodology

This study employed a qualitative methodology to examine the influence of an AI chatbot on student engagement and support within higher education. Specifically, an Interpretive Phenomenological Analysis (IPA) was employed to analyze collected data and derive findings in response to the research questions**.** IPA, which has gained prominence across diverse academic fields, is recognized for its value in investigating existential experiences (Finlay, 2011). Offering a versatile and adaptable approach, IPA serves as a promising method for comprehending individuals' lived experiences (Smith et al., 2009). IPA has the potential to understand and interpret people's experiences, facilitated by its practical and accessible guidelines (Shinebourne & Smith, 2009a, 2010; Smith & Osborn, 2003). It is essential, however, to acknowledge IPA's methodological limitations and carefully consider them in its application.

Participant Selection, Sample Size and Techniques

The present study examined the influence of an AI chatbot on student engagement and support within higher education. The study had a specific focus on the perceptions of students from Kerala, India. This decision was made to gather comprehensive data from this population and gain a nuanced understanding of the phenomenon under investigation. The target population consisted of students who were interviewed or approached to respond to open-ended self-administered questions. A purposive sampling technique was used to collect data, resulting in a sample of 11 participants. The sample included seven (64%) males and four (36%) females. Additionally, the sample encompassed a diverse range of educational backgrounds, including five (45%) students who were pursuing postgraduate studies and six (55%) individuals who were engaged in university and doctoral research in education, management, and science. The

selected participants possessed relevant knowledge pertaining to the phenomenon under investigation, making them well-suited for the study.

Prior to conducting the interviews, the research team obtained informed consent and assessed the participants' willingness to participate in the study. Permission was also sought from the university dean to conduct the research. The researcher adhered to the Committee on Publication Ethics guidelines throughout the research process. Participants were assured of the confidentiality of their personal information, and steps were taken to ensure the privacy and security of their data.

Interview Process

In conducting the interviews for this study, it was important to maintain a focus on listening to the participants and understanding the meanings associated with their experiences, rather than simply seeking direct answers to predetermined questions (Roberts, 2020). The interviews were conducted face-to-face between mid-March and the first week of April 2023. Each interview lasted approximately 40 to 50 minutes. Eight semi-structured questions were prepared beforehand, covering topics related to general chatbot usage, chatbot usage at their institution or university, and expectations of AI chatbot functionality. Additionally, personal questions such as the participant's course of study, type of institution, and years of experience using AI chatbot were included. Some spontaneous questions were also asked during the interviews to clarify responses.

To maintain structure during the interviews, the list of questions was used as a reference, but the researcher allowed for flexibility and deviation from the list to explore important topics further (Roberts, 2020). While specific probes were not written down, the researcher employed them during the interviews to keep the participants engaged, summarize the topics, manage the flow of the conversation, and ensure understanding. Probes such as "Please continue," "That's intriguing, could you provide further details?" or "Could you revisit and explain more about?" were used. The purpose of the probes was to maintain engagement, summarize key points, ensure a smooth conversation flow, and check for comprehension, all in accordance with Roberts' (2020) suggestions. By following these interview techniques, the researcher aimed to elicit rich and detailed responses from participants, allowing them to share their expertise and knowledge of their experiences using AI chatbots. This approach aligned with Roberts' (2020) recommendations regarding the importance of listening to participants and viewing them as experts in answering research questions.

Data Analysis

The study employed the Systematic Text Condensation (STC) method, a widely utilized approach within the framework of IPA, to analyse interview data. The application of the STC method involved a structured five-step process: identifying and extracting distinct segments of text as Meaning Units, distilling and paraphrasing these into Condensed Meaning Units, assigning codes for organization, aggregating related codes into Sub Themes that highlight

patterns, and ultimately synthesizing these into overarching Themes (Malterud, 2012). A comprehensive explanation of this method, complete with illustrative details, is available in the Appendices section of the paper.

Results

The exploration of students' perspectives of AI chatbots uncovered eight distinct themes. These themes included Dual (Effectiveness and Limitations), Beyond, Enrichment, Optimization, Synergize, Streamlining Communication, Engage+AI, and Refine. Each theme provided insight into AI chatbots' multifaceted functions within the realm of higher education and beyond. These themes provide valuable insight into the dynamic interplay between AI chatbots and the educational landscape.

The theme of "Dual Effectiveness and Limitations" explores the contrasting aspects of AI chatbots, specifically their ability to provide quick assistance and their limitations in addressing complex issues. For example, Respondent 3 stated, "Personally, I find chatbots quite helpful. They offer convenience by eliminating the need to wait for customer service representatives. Chatbots provide instant assistance and guide me through various processes, like my PhD admission process, making interactions efficient and hassle-free." Respondent perspectives connected to the theme by exemplifying the contrasting aspects of chatbots' effectiveness in providing quick assistance and their limitations in addressing more intricate matters, such as those encountered during a PhD admissions process. This duality highlighted the necessity of adopting a well-balanced approach that maximizes the advantages of both elements while recognizing and addressing their respective drawbacks, thereby fostering a strategic and effective utilization strategy (Green & Johnson, 2021; Okonkwo & Ade-Ibijola, 2021).

Transitioning to the theme of "Beyond," a deeper examination revealed the extended influence of AI chatbots beyond the traditional boundaries of education. The subthemes of "Smooth User Experience" and "Communication Challenges" provided perspective on the effortless interactions encountered by students, contrasted with potential obstacles in communication (Kooli, 2023; Pereira et al., 2019). For instance, Respondent eight explained, "Absolutely, AI chatbots have gone beyond just assisting with education. They contribute to a much broader impact. For instance, the Smooth User Experience they provide is remarkable. I find it easy to interact with them, accessing information and resources seamlessly. This makes my academic journey smoother." This participant recognized AI chatbots' influence beyond education. This enhancement in the academic journey signified the "Beyond" theme, where chatbots go beyond norms to elevate user experiences. Another illustration comes from Respondent 11 who explained, "Of course, while the experience is generally smooth, there are times when the Communication Challenges emerge. AI Chatbots might struggle to understand complex medical queries or interpret specific nuances. This can lead to misunderstandings or incomplete responses. So, while they excel in many ways, there's room for improvement in certain areas." The respondent pointed out that despite the overall smoothness of their interaction with AI chatbots, they've encountered instances of "Communication Challenges." These challenges arose when chatbots face difficulty comprehending intricate medical queries or grasping

specific nuances. Consequently, this can result in misunderstandings or responses that lack completeness.

While AI chatbots have strengths, the participants highlighted their limitations, indicating potential for enhancement in specific aspects. The theme explored the transformative potential of AI chatbots to surpass traditional roles and expand the scope of engagement. The focus of this discussion centered on the concept of "Enrichment," with particular attention given to comprehensive improvements AI chatbots offer to individuals' daily experiences. This led to the subtheme of "Personalized Recommendations." This subtheme was acknowledged by one respondent who stated, "Let's say I'm looking for research materials. The chatbots not only help me find relevant resources but also suggest related readings based on my past searches. It's like having a study partner who knows my needs." Another subtheme of "Real-Time Updates and Navigation" enhanced the personalized and timely assistance offered, enhancing both recreational activities and regular tasks (Cunningham-Nelson et al., 2019). This theme encompasses the ability of AI chatbots to enhance user experiences by providing personalized and dynamic assistance.

Advancing to the theme of "Optimization," attention is drawn to the refined communication processes facilitated by AI chatbots. The subthemes of "Enhanced Communication Experience" and "Streamlined Efficiency" are indicative of heightened engagement and prompt response times, as evidenced by Kuhail et al. (2022) and Lee et al. (2020). This theme reflected AI chatbots' potential to optimize communication, ultimately heightening user satisfaction and experiences.

The theme of "Synergize" emphasized the harmonious integration of AI chatbots with human elements. Addressing concerns about "Data Security and Confidentiality" and "Reliability and Accuracy," this theme advocated for a collaborative utilization approach (Touimi et al., 2020; Wang et al., 2021). "Human Interaction" and "Personalization" contributed to a holistic interaction paradigm, emphasizing mutual reinforcement and effectiveness. Respondent 7 for instance, noted, "Well, it's a delicate balance. AI chatbots can streamline tasks and provide quick assistance, but when it comes to personal or confidential matters, human expertise is crucial. We need to ensure that sensitive data is handled securely and that there's a human touch for situations that require empathy and understanding."

The theme of "Streamlining Communication" explored the symbiotic relationship between AI chatbots and human engagement. While "Efficient and Accurate Responses" enhanced interactions, "Limitations in Complex Inquiries" underscored areas where human judgment remains vital. "Complementary Role with Human Support" suggested that AI chatbots can enhance human resources for specialized tasks, emphasizing seamless coexistence (Khan et al., 2019). The central focus of the "Engage + AI" theme accentuated collaborative interactions between students and AI chatbots, illustrated by a Respondent 5 who said, "From my experience, I've noticed how students and AI, like ChatGPT, team up. For example, when I needed insights for financial analysis, ChatGPT quickly gave me relevant information, making my work more effective."

Subthemes like “Convenience and Efficiency” and “Personalization and Recommendations” exemplified AI chatbots’ ability to stimulate student engagement (Kuhail et al., 2022; Tlili et al., 2023). Additional subthemes, such as “Trust and Social Influence” and the role of being a “Reliable and Knowledgeable Resource” were exemplified by Respondent 7 who explained, This whole interaction between scholars and AI is interesting. For instance, when I needed advice for survey design, ChatGPT’s reliable insights boosted my engagement and helped improve my research quality.” These elements depicted AI chatbots as catalysts for creating immersive user experiences.

Finally, the theme of “Refine” encompassed the iterative process of enhancing AI chatbots. Subthemes such as “Natural Language Understanding and Adaptability” and “User Experience and Interface Design” underlined ongoing improvements. “Speed and Accuracy” highlighted the importance of promptness. This theme signified the continuous refinement of AI chatbots’ capabilities, ensuring sustained user satisfaction and usability (Tlili et al., 2023).

To summarize, the presence and potential of AI chatbots in higher education are made clear by eight themes, together they portray AI chatbots as dynamic agents of transformation and innovation. Through theoretical consistency and conceptual alignment, the UTAUT2 model’s constructs with identified themes and subthemes provided a comprehensive framework for understanding AI chatbots’ multifaceted contributions and how they might shape the future for students in higher education.

Study Themes Collated with the UTAUT2 Constructs

The connection between the identified themes and the UTAUT2 (Venkatesh et al., 2003; Venkatesh et al. 2012) constructs was established by a meticulous assessment applying two rigorous criteria: theoretical consistency and conceptual alignment. The theoretical consistency of the UTAUT2 model was demonstrated through its integration of established theories from diverse It aligns with principles of technology acceptance and adoption, ensuring logical soundness and relevance (Lee & Rho, 2013; Venkatesh et al., 2003 & 2012). The UTAUT2 model achieves robust conceptual alignment by seamlessly integrating and extending core components from established technology adoption theories such as Technology Acceptance Model (Davis, 1989), the Theory of Planned Behavior (Ajzen, 1991), and the Innovation Diffusion Theory (Rogers, 1961). Through this synthesis of constructs, UTAUT2 offered a comprehensive framework for understanding the multifaceted factors shaping technology acceptance, while also accommodating contextual intricacies. This alignment enhanced its practical relevance and theoretical robustness, contributing to its prominence in contemporary research (Lee & Rho, 2013; Venkatesh et al., 2003; Venkatesh et al., 2012).

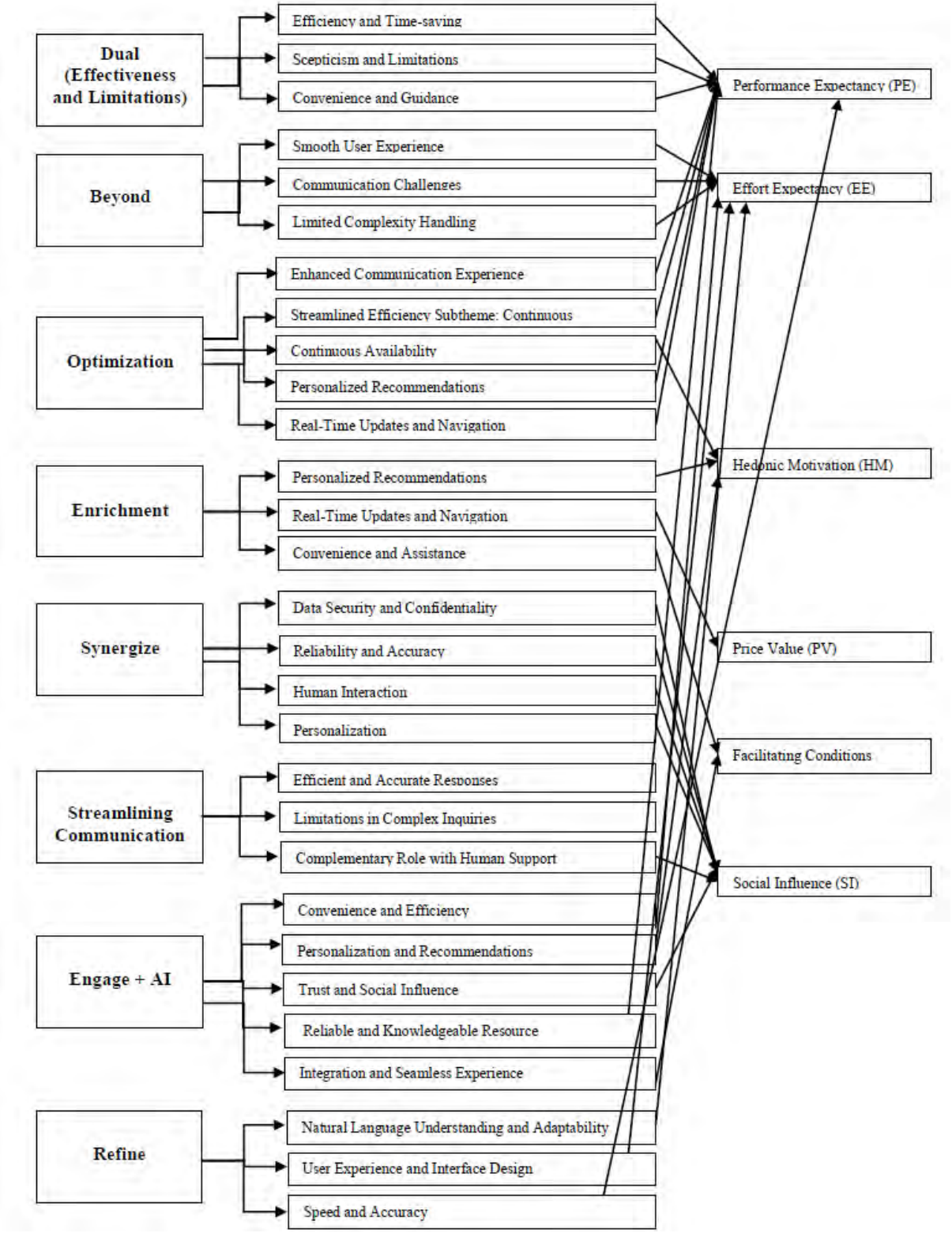
Integration of the UTAUT2 Constructs with Identified Themes

The analysis of AI chatbots themes and subthemes in the context of UTAUT2 (Venkatesh et al., 2003; Venkatesh et al. 2012) constructs revealed a strong theoretical consistency and conceptual alignment. The “Dual (Effectiveness and Limitations)” theme, including subthemes

"Efficiency and Time-saving", "Skepticism and Limitations" and "Convenience and Guidance" aligned with Performance Expectancy (PE), capturing users' expectations of benefits and concerns. The "Beyond" theme, with subthemes "Smooth User Experience" and "Communication Challenges," corresponded to Effort Expectancy (EE), highlighting convenience and potential difficulties. "Enrichment" subthemes like "Personalized Recommendations" related to Hedonic Motivation (HM), focusing on enjoyment and enhancement. "Optimization" subthemes such as "Enhanced Communication Experience," aligned with Performance Expectancy (PE) by emphasizing improved task execution. The "Synergize" theme, featuring subthemes like "Data Security and Confidentiality," aligned with Social Influence (SI), reflecting the influence of norms. The "Streamlining Communication" subtheme tied to Performance Expectancy (PE) and Social Influence (SI), while the "Engage+AI" subthemes, including "Trust and Social Influence," aligned with Performance Expectancy (PE) and Social Influence (SI). Finally, the "Refine" theme, with subthemes "Natural Language Understanding and Adaptability," aligned with Effort Expectancy (EE). This analysis demonstrated the UTAUT2 model's robustness in capturing AI chatbots' adoption complexities.

Figure 1

Integration of the UTAUT2 Constructs with Identified Themes



Discussion

The discussion section comprehensively addresses the main research questions, which are divided into two distinct segments. The first segment examines into the perceptions surrounding the augmentation of student engagement and support in higher education through the utilization of AI chatbots. The second segment critically examines the multifaceted factors that intricately mold student preferences concerning the deployment of AI chatbots for communication within higher education. In particular, the second segment focuses on the intricate interplay between security, privacy considerations, and the decision-making processes that support the adoption of AI chatbots for addressing a spectrum of academic inquiries, encompassing admissions, course-related matters, academic affairs, and library resources.

Perceptions of AI Chatbots in Enhancing Student Engagement and Support in Higher Education

AI chatbots play a diverse role in higher education, revealing different aspects that enhance student engagement and academic support (Pérez et al., 2020; Abbas et al., 2022; Studente et al., 2020). They have both strengths and limitations, efficiently providing quick answers to common queries, but struggling with more complex issues. These chatbots are handy for routine tasks, like giving timely information and helping with administrative matters, but doubts remain about their ability to handle intricate problems. Striking a balance between their strengths and weaknesses is crucial (Green & Johnson, 2021). However, chatbots also go beyond education, improving user experiences by offering smooth interactions and addressing communication challenges (Kooli, 2023; Tlili et al., 2023). While they might not excel at handling complex interactions, they enrich experiences in various ways, such as easing university transitions and promoting peer connections (Kooli, 2023; Tlili et al., 2023; Studente et al., 2020). Moreover, they provide personalized recommendations and real-time updates that enhance daily routines, making them convenient and supportive (Kuhail et al., 2022). These chatbots don't just assist in education but also streamline administrative tasks, allowing teachers and staff to focus on more intricate matters (Lee et al., 2020; Okonkwo & Ade-Ibijola, 2021).

AI chatbots optimize communication, enhancing the overall experience. They improve engagement, offer spot responses, and suggest personalized recommendations, leading to higher satisfaction (Lee et al., 2020). Availability around the clock is also important for consistent support (Green & Johnson, 2021). Chatbots work in synergy with human interaction, balancing concerns about data security and confidentiality. They contribute to a comprehensive approach and show potential for beneficial collaboration between humans and technology (Watson et al., 2022; Khan et al., 2019). AI chatbots and human engagement complement each other, making interactions efficient and accurate. While they shine in straightforward responses, human judgment is irreplaceable for complex inquiries (Green & Johnson, 2021). They have the potential to enhance specialized tasks, acting as valuable partners alongside humans (Touimi et al., 2020). They also engage users effectively by offering convenient interactions and personalized suggestions (Kuhail et al., 2022; Studente et al., 2020). There's an ongoing effort to refine AI chatbots. Improving their natural language understanding, adaptability, user experience, interface design, speed, and accuracy are important for ensuring user satisfaction over time (Li et al. 2021). Based on the current research findings, students view AI chatbots as valuable tools in higher education, offering rapid assistance, boosting engagement, and simplifying communication, all while aiming for ongoing enhancement.

Factors Shaping Student Preferences for AI Chatbots in Higher Education: Addressing Security, Privacy, and Decision-Making

The influence of AI chatbots as a means of communication in higher education is examined through the UTAUT2 framework (Venkatesh et al., 2012). This framework provided valuable insight into the factors that shape students' preferences for using AI chatbots and how these preferences can impact engagement and support. One key factor that affected participants' views on AI chatbots communication was "Performance Expectancy," an aspect of UTAUT2. This factor related to the belief that AI chatbots can enhance educational outcomes and improve the overall student experience (Liu et al., 2019). This aligned with the idea highlighted in the "Dual (Effectiveness and Limitations)" theme, which emphasized the efficiency of AI chatbots in delivering timely and consistent information (Pérez et al., 2020; Abbas et al., 2022). Such a positive perception can significantly influence students' inclination towards AI chatbots and impact their preferences. This factor referred to how user-friendly and easy it was to interact with AI chatbots (Johannsen et al., 2018). This aligned with the "Engage+AI" theme, which illustrated how chatbots enhance user engagement through convenience, efficiency, and personalized recommendations (Kuhail et al., 2022). When students perceive AI chatbots as effortless to use, they are more likely to adopt them for communication.

The influence of peers, instructors, and institutional norms, known as "Social Influence," corresponded with the "Synergize" theme. Positive feedback and recommendations from peers and instructors significantly shaped participants' willingness to use AI chatbots (Watson et al., 2022; Khan et al., 2019). This is consistent with UTAUT2's emphasis on social factors impacting technology adoption (Wang et al., 2021). Additionally, the "Facilitating Conditions" aspect of UTAUT2 is vital. This factor highlighted the necessity for a supportive environment, including reliable internet access and technical assistance (Li et al., 2021). This aligned with the "Optimization" theme, where AI chatbots were refined to provide enhanced communication experiences (Lee et al., 2020). Furthermore, concerns related to security, privacy, and other factors influenced participants' decisions regarding AI chatbot adoption. These concerns were addressed within the "Synergize" theme, which emphasized the importance of finding a balance between data security, confidentiality, and reliability (Kooli, 2023). Addressing these concerns is crucial for building student trust in AI chatbot communication. The combined insights from this study's themes and the UTAUT2 constructs elucidate how students perceive the role of AI chatbots in improving engagement and support in higher education. These discussions offer a comprehensive understanding of the factors that influence students' preferences for AI chatbot communication and how these preferences can impact their educational experiences.

Limitations and Future Research Directions

The present study's scope and generalizability are rooted in a specific higher education context, potentially limiting the transferability of the findings to more diverse environments or student populations. In addition, the small sample size ($n = 11$) might not fully encompass the spectrum of student perceptions, potentially restricting a comprehensive understanding. While the phenomenological approach provides rich insights, subjectivity in data interpretation, influenced by the researcher's perspective, could introduce bias. The cross-sectional design might miss temporal shifts, suggesting the value of longitudinal studies for dynamic insights. Differing AI familiarity levels among participants could have led to varied interpretations. Despite efforts for objectivity, researcher biases could impact design, data collection, and analysis. Unaccounted external influences like media portrayal might have affected

participants' perceptions. Prioritizing depth over breadth, the study might limit a holistic understanding of AI chatbots perceptions. Sole reliance on phenomenological analysis could be enriched by multiple methodologies. Ethical concerns arise around personal perceptions and privacy. These limitations call for cautious interpretation, while future research paths offer exciting potential for enhancing AI chatbot communication in education. Longitudinal studies might track AI chatbots' impact over time, while comparative studies offer context-specific insights. A blend of qualitative and quantitative research can uncover user experiences, and ethical considerations ensure responsible practices. Professional development for staff can optimize integration, enriching AI chatbot communication and elevating the educational landscape through enhanced engagement and support.

Conclusion

This study has significantly advanced the field's comprehension of AI chatbot communication within higher education, spotlighting its substantial role in bolstering student engagement and support. Employing a meticulous analysis of thematic patterns and subthemes through the lens of UTAUT2 constructs, it has propelled the field forward by furnishing a comprehensive outlook on the adoption and embrace of AI chatbots. The main findings (results) of the study fit well with previous literature that also talk about numerous benefits of AI chatbots used in higher education. These benefits include giving personalized help, making administrative tasks smoother, and increasing interactions between students and others (Okonkwo & Ade-Ibijola, 2020; Cunningham-Nelson et al., 2019; Green & Johnson, 2021).

It is also important to know about the limits in how this study was done, which makes sure the research is truthful and strong. The way the study used phenomenological questions and IPA gave the researchers a good sense of the participants' real experiences, but it is also important to know that these ideas can't show why things happen or how students think in every situation (Tuffour, 2017; Smith et al., 2009). This study adds to what we know by not only showing what AI chatbots can do, but also their limitations and challenges. It talks about how important it is to think about the things that make them work well, like what helps them, how students think, and making them better over time. At the same time, it knows that there are some things it couldn't look at, like only studying specific parts and using what students already know. The next step is to look at new things, like studying more ideas, using new discoveries, and looking at different level of education. Even though this study only looks at colleges and university, its ideas can help other levels of education, too. In a world where AI chatbots are changing how we talk and learn in higher education, this research is like a strong start, giving us ideas for more research and ways to make them even better (Kooli, 2023; Dwivedi et al., 2023; Mendoza et al., 2020; Watson et al., 2022). Knowing about its limits, facing its challenges, and giving helpful advice, this study builds a strong base for us to learn more about AI chatbots in higher education.

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Appendixes

Table 1

STC Table, Model of Data Analysis Arriving Codes and Theme

Meaning Unit	Condensed Meaning Unit	Code	Sub theme	Theme
1. What is your opinion on AI chatbots and do you find them helpful? Please provide a detailed description of your viewpoint. Respondent (R) 1: I believe chatbots are incredibly helpful. They provide quick and accurate responses, saving time and effort in finding information or resolving queries. Their availability 24/7 ensures immediate support, making them a valuable tool in today's fast-paced world. R 2: Personally, I find chatbots quite helpful. They offer convenience by eliminating the need to wait for customer service representatives. Chatbots provide instant assistance and guide me through various processes, making my interactions efficient and hassle-free.	Chatbots are helpful in providing quick and accurate responses, saving time and effort. Chatbots offer convenience by providing instant assistance and guiding users	Chatbots are helpful in providing quick and accurate responses, saving time and effort for users.	Efficient and Time-saving	

R 3: I'm skeptical about chatbots' effectiveness. While they can handle basic queries, complex issues often require human intervention. Chatbots sometimes fail to understand nuanced questions, leading to frustration and a need for human support. R 4: Chatbots are a mixed bag for me. In some cases, they provide useful information promptly. However, when faced with more specific or personalized queries, chatbots often fall short and fail to deliver the level of assistance I require. R 5: I find chatbots helpful in certain contexts. For simple tasks like checking order statuses or getting basic information, they excel. However, when it comes to more complex discussions or problem-solving, human interaction remains irreplaceable. R 6: Chatbots are a great concept, but their execution needs improvement. While they offer quick responses, the lack of	through various processes. Skepticism exists regarding Chatbots' effectiveness, especially for handling complex issues that may require human intervention. Chatbots are useful for simple tasks but may fall short when	Skepticism surrounding chatbots' effectiveness, particularly in handling complex issues that may require human intervention	Skepticism and Limitations	Dual (Effectiveness and Limitations)

human touch can be frustrating at times. I appreciate their availability, but there's still room for enhancing their capabilities. R7: Personally, I haven't found chatbots to be particularly helpful. Their pre-programmed responses often fail to address my specific needs. I prefer direct human interaction for a more personalized and tailored experience. R 8: I see the potential of chatbots and their usefulness. As technology advances, they continue to improve, providing more accurate and comprehensive assistance. While they may not be perfect, their convenience and accessibility outweigh any drawbacks. R 9: Chatbots are a valuable tool in certain situations. Their ability to provide quick answers and support can be beneficial, especially for routine inquiries. However, when it comes to	faced with specific or personalized queries. It has potential and continues to improve, but there is a need to enhance their capabilities and address the lack of human touch.	Offer convenience by providing instant assistance and guiding users through various processes.	Convenience and Guidance	

complex or sensitive matters, human interaction remains essential. R 10: I find chatbots helpful, especially in scenarios where human assistance is limited or unavailable. They provide instant responses, reduce waiting time, and offer guidance in a self-service manner. However, for more complex issues, I prefer interacting with a human representative. R11: My opinion on chatbots is neutral. While they can be helpful in providing basic information, I believe that human interaction brings a personal touch and better understanding.				

Table2

Items wise Codes and Theme

Items	Code	Sub theme	Theme
2. How has been your experience when using a chatbots outside of the education field? How would you describe your recollection of it and the overall user experience?	"The positive aspect of the chatbots outside of education, emphasizing its easy navigation, quick responses, and overall seamless user experience".	Smooth User Experience	Beyond
	"Frustration experienced when the chatbots failed to understand queries and provided	Communication Challenges	

	irrelevant responses, leading to wasted time and a frustrating user experience". "Its ability to quickly resolve queries and provide personalized responses, resulting in a satisfactory user experience",	Limited Complexity Handling	
3. Do you believe chatbots are capable of delivering useful services or information? If so, what specific types of services would you find acceptable for a chatbots to provide, other than basic course and University information?	"Chatbots providing tailored suggestions for books, movies, and other interests". "Chatbots delivering real-time traffic updates and alternative route suggestions". "Scheduling appointments, sending reminders, and providing financial advice or budgeting assistance".	Personalized Recommendations Real-Time Updates and Navigation "Convenience and Assistance".	Enrichment
4. What were the primary factors that influenced your decision to choose AI chatbots as a means of communication with an institution/university?	"AI chatbots offer easy access to information and provide convenient communication with the university". "Streamline communication processes, resulting in faster responses and reduced waiting times". "Ensuring assistance is accessible at any time, including outside regular office hours".	Enhanced Communication Experience Streamlined Efficiency Continuous Availability	Optimization
5. Do you have any specific reasons or	"Concerns about the safety and protection	Data Security and Confidentiality	

concerns that would deter you from choosing AI chatbots as a communication channel with your institution/ university particularly in terms of security, privacy, or any other factors?	of personal information, including worries about data breaches and unauthorized access". "Desire for private conversations and a preference for human representatives over automated systems to ensure confidentiality and privacy". "Incorrect information or misinterpret queries, leading to misunderstandings or incorrect decisions". "The value of human touch and personalized interaction, which may be lacking in AI chatbots communication". "The ability of AI chatbots to understand individual needs and provide tailored solutions, resulting in a lack of customization and personalization".	Reliability and Accuracy Human Interaction Personalization	Synergize
6. Do you believe AI chatbots have the capability to serve as a communication medium for addressing your inquiries with the institution/ university regarding admissions, course and academic related, and library reference?	"Quick and accurate responses, saving time for both users and institutions". "To handle complex inquiries that requires human judgment and empathy".	Efficient and Accurate Responses Limitations in Complex Inquiries	Streamlining Communication

	"Handling basic inquiries and freeing up human resources for more specialized or complex tasks".	Complementary Role with Human Support	
7. What factors would motivate you to repeatedly use an AI chatbots at the institution/university instead of email, creating a regular usage pattern? Would a recommendation from a friend, or peer influence your decision to use it?	"AI chatbots as a motivating factor for repeated usage. Users appreciate the quick access to information, prompt responses, and streamlined communication process". "Users are motivated to use chatbots repeatedly when they can understand their preferences and provide relevant suggestions". "Users are more likely to adopt regular usage patterns if they receive positive feedback or endorsements from trusted sources". "When they can rely on them as a reliable and knowledgeable resource". "The integration of AI chatbots with other university systems and platforms and they can seamlessly connect with various tools and enhance their overall experience.	Convenience and Efficiency Personalization and Recommendations Trust and Social Influence Enlighten Integration and Seamless Experience	Engage+AI
8. What feature do you consider the most	"Chatbots ability to understand and		

important in an AI chatbots? Please explain your expectations and walk me through the key aspects you prioritize.	interpret queries in natural language". "The significance of tailoring the chatbots responses and interactions to the user's preferences". "The user's expectations for prompt and accurate responses from the chatbots, emphasizing the need for efficient and reliable interactions".	Natural Language Understanding and Adaptability User Experience and Interface Design Speed and Accuracy	Refine