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Determinants of ChatGPT Adoption in Academe & Other Fields – A Review on Theoretical Perspective

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Abstract: ChatGPT has been showing promising advantages including its capability to optimize work and converse like human being. In the academe, ChatGPT was seen to have the capability to answer formative assessments, aid in research, and act as virtual tutor. However, ChatGPT is also being criticized for its misleading and inaccurate responses. This led the scientific community to further study its adoption factors. This review discussed and analyzed 53 empirical studies that aimed to determine the factors influencing ChatGPT adoption and use in the academe and other fields. Performance expectancy, personal innovativeness, trust, attitude, and self-efficacy were identified as common determinants of ChatGPT adoption in various fields. To add, experience and presence of Generative AI policy also determine ChatGPT adoption. Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT/UTUAT2) are the most widely used frameworks found in this review. Practically, this review recommends that ChatGPT adoption and use be further studied in educational sector focusing on the contrasting results of significant factors found. Policy on how academic institutions will adopt and use ChatGPT is also highly recommended. With respect to other areas, studies on ChatGPT adoption and use in other economic institutions (healthcare, business, law, software development, dentistry, etc.) are recommended. Theoretically, this review recommends use of TAM and UTUAT/UTUAT2 in future studies of ChatGPT adoption considering personal innovativeness, trust, and self-efficacy as extension constructs and focusing on experience and policy as moderating constructs.

Keywords: Education, ChatGPT, TAM, UTAUT2, Innovativeness, Trust, Self-Efficacy, Policy, Experience, Review

1. Introduction

ChatGPT, a Large Language Model Generative AI launched in November 2022 (Cao et al., 2023; Hacker et al., 2023), has been seen to be experimented in various fields. The preliminary studies related to use of ChatGPT provided the scientific community the advantages and challenges in using ChatGPT. While ChatGPT was seen to provide efficiency and optimization in the current task at hand (Gao & Han, 2021) and has shown to have the capability to converse like a human being (Gilson et al., 2023; Wittmann, 2023), it was also seen to be misleading and inaccurate (Cooper, 2023; Sorin et al., 2023). These led to further studies where ChatGPT adoption and use were further examined so as to identify determinants of ChatGPT adoption in various fields. However, these studies are done in silos and that constructs, mediating, and moderating factors vary from one study to another.

With the growing number of empirical studies related to adoption and use of ChatGPT, the need to look at this socio-technological phenomenon on practical and theoretical perspective rises. This review answered the following research questions: (1) What are the fields to which ChatGPT adoption and use were studied?; (2) What are the theoretical frameworks used in understanding ChatGPT adoption and use?; and (3) What are the determinants of ChatGPT adoption in the academe and in other fields?

Practically, this review consolidated the common factors that are considered in ChatGPT adoption and use in academe as well as in other fields. Theoretically, this review examined theories used in ChatGPT adoption and thereby providing insights on common theories used, common factors found in various theories, and common pattern on how theories are designed for specific study.

This research provided novelty as it reviewed, summarized, and analyzed 53 published empirical studies that answered the question "*What are the factors influencing behavioral intention to adopt and use ChatGPT?"*.

2. Material and Methods

Review articles and research articles are empirical studies included in this review. The exclusion criteria for this review are: (1) other articles (encyclopedia, book chapters, book reviews, discussions, editorials, mini reviews, practice guidelines, and short communications); (2) non-English publications; and (3) studies that are not pertaining to determining ChatGPT adoption and use factors.

In this review, ChatGPT adoption and use were looked at 11 different adoption theories based on a summarized review of adoption models (Taherdoost, 2018). The final screening was done through reading the Abstract, Methodology, Results, and Discussions of the studies. Records that don't discuss determining factors leading to ChatGPT adoption and use were excluded. Finally, records whose full paper is inaccessible to the authors due to subscription were excluded.

3. Results and Discussion

The flowchart of inclusion and exclusion criteria can be seen in Figure 1. As seen, a total of 3,485 unique articles were included in this study. The number reduced to 815 after specifying the topic of choice, ChatGPT. Lastly, with focus on adoption and use of ChatGPT as main topic and accessibility of records considered, 53 articles are included in this review.

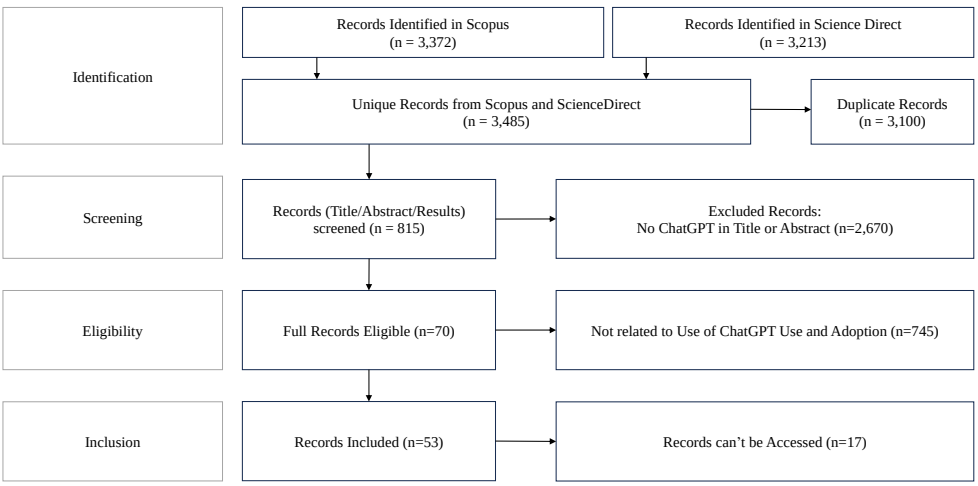

Figure 1. Flowchart of the Record Selection Process

3.1 Fields that Studied ChatGPT Adoption

ChatGPT adoption and use is widely studied in educational field which accounts for 38 records in this review. This is followed by the exploration of ChatGPT for general use (search engine, chat, etc.) with eight records. ChatGPT adoption and use in healthcare and business were

also explored at three each. Lastly, ChatGPT adoption and use for software development has one study. Using ChatGPT under the academe were further looked at wherein 33 out of 38 studies explored ChatGPT adoption and use is about general education. On the other hand, academic use of ChatGPT in the areas of Healthcare, Marketing, Information Systems, Physics, and Software Development have one record each.

3.2 Theories Used in the Study of ChatGPT Adoption and Use

In total, the studies involved in this review used 12 technology adoption theories. Among the traditional adoption theories, TAM and UTAUT are most widely used with 17 and 15 records, respectively. UTAUT2, an extension of UTAUT, was also used extensively accounting to eight records. Other traditional adoption theories, Diffusion of Innovations and Social Cognitive Theory, were also used at three records each. Technology-Organization-Environment (TOE), which was not covered in the initial list by Taherdoost (2018), came out as an additional theory during the selection process.

Extending traditional adoption theories was seen in the review. Specifically, the emergence of AIDUA (Gupta, 2024; Ma & Huo, 2023) and TAME-ChatGPT (Abdaljaleel et al., 2024) as theories for AI adoption. AIDUA introduces anthropomorphism as a construct, which is about perceived humanness of AI. In the two studies where AIDUA was used, this was found to be significant. On the other hand, TAME-ChatGPT introduces risk factors in the study. These were also generally found to be significant.

Another theme that was seen in the study was the inclusion of self-efficacy (Dahri et al., 2024), trust (Tiwari et al., 2023), and personal innovativeness (Mahmud et al., 2024) as significant extension constructs. On the other hand, among the additional constructs of UTAUT in UTAUT2, only Hedonic Motivation (HM) showed significance based on this review. Perceived cost and habit were usually found to be not significant (Foroughi et al., 2023; Sankaran et al., 2023).

Lastly, experience and policy are moderating factors found to be significant in this review. In the economic sector for example, policy must be further studied with respect to ChatGPT use given that such technology is open source (Ching & Ona, 2014; Ebardo, 2018; Trapero et al., 2019) while in the academe, policy may include ethical considerations as new technologies are adopted (Ebardo & Wibowo, 2021; Trapero et al., 2020). Age and gender, while it is explored, are usually found to be not significant or has no mediating effect (Bazelais et al., 2024; Jo & Bang, 2023).

3.3 Determinants of ChatGPT Adoption

Adoption and use of ChatGPT in the academe is widely and intensively studied. Based on the review, covering 29 countries Performance Expectancy/Perceived Usefulness (PE/PU) (Alrishan, 2023; Bazelais et al., 2024; Boubker, 2024; Duong et al., 2023) is found to be the most significant factor influencing ChatGPT adoption and use. Aside from PE/PU, attitude (Dahri et al., 2024; Mahmud et al., 2024; Polyportis & Pahos, 2024; Tiwari et al., 2023), trust (Dahri et al., 2024; Tiwari et al., 2023), and self-efficacy (Dahri et al., 2024) were also found to be significant. Interestingly, Effort Expectancy/Perceived Ease of Use (EE/PEOU), Social Influence (SI), and Facilitating Conditions (FC) do have varying results in the academic field.

Further investigation showed that in Bangladesh, EE/PEOU was found to be insignificant while on the same country (Awal & Haque, 2024), it was found to be an influencing factor (Rahman et al., 2023) in the academe. In Malaysia, SI was also seen to have differences in terms of the results (Dahri et al., 2024; Mukred et al., 2023; Foroughi et al., 2023). While there are constructs that does not align even the study is based on same field, application,

and country, there are those are found be consistent. In Jordan (Abdaljaleel et al., 2024), India (Gulati et al., 2024), and UK (Budhathoki et al., 2024), EE/PEOU and SI are found to be significant among various studies. Citing similarity in consistency of results, in China EE/PEOU is also found to be insignificant (Liu et al., 2024; Zou & Huang, 2023).

ChatGPT has an inherent advantage of being able to converse like a human being. Next to academe, the adoption and use of ChatGPT as a conversational agent was also intensively studied. The results are consistent where PE/PU and EE/PEOU are major factors determining adoption and use (Hasan Emon et al., 2023; Kumar et al., 2024). The result is different comparing to academic field where inconsistency in EE/PEOU was seen. Additionally, SI and FC were also found to be significant (Hernandez et al., 2023; Lee et al., 2024). Extension constructs including attitude (Hasan Emon et al., 2023; Lee et al., 2024) and trust (Hasan Emon et al., 2023; Hernandez et al., 2023) also drive the adoption and use of ChatGPT. Interestingly, self-efficacy, which was found to be a major factor in academic field, was not included as a factor to be studied in general use of ChatGPT.

Other areas where ChatGPT adoption and use was studied are in healthcare (Shahsavar & Choudhury, 2023), business (Gupta, 2024), banking (Bouteraa et al., 2024), and software development (Kuhail et al., 2024). Similar to the academic field and with the general use of ChatGPT, PE/PU is the most cited factor affecting adoption and use of ChatGPT. This is followed by EE/PEOU, SI, and trust. Personal Innovativeness came out as a theme in this field. Lastly, policy (Bouteraa et al., 2024) and experience (Gupta, 2024) as moderating factor also came out as significant.

4. Recommendation and Further Studies

ChatGPT adoption in the academic field has been intensively studied. However, areas to be further explored in this field includes deeper understanding on PE/PEOU, SI, and FC as these have varying results. Most of the studies are also conducted using quantitative analysis and thus, a qualitative or mixed method may be explored to further understand the socio-technological phenomenon. To further deep dive, a study understanding how ChatGPT enacts social structures in terms of norms and practices may support the differences in the claims. On the other hand, a couple of other fields can be further studied since ChatGPT is seen to be advantageous in these fields, too. This list includes healthcare, law, dentistry, software development, marketing, and other business fields.

In terms of theoretical foundation, UTAUT/UTUAT2 and TAM have strong explanatory power to be used as basis in studying adoption and use of ChatGPT focusing on PE/PU, EE/PEOU, SI, FC, HM, and attitude. Moreso, factors including trust, personal innovativeness, and self-efficacy are recommended to be considered in studying ChatGPT adoption and use. Lastly, incorporation of policy and experience should also be explored while age and gender may not be a priority focus given its non-moderating effects.

5. Conclusion

This review showed the determinants of ChatGPT adoption. Performance expectancy, personal innovativeness, trust, attitude, and self-efficacy were identified to be common significant factors affecting ChatGPT adoption and use in various fields. On the other hand, experience and presence of GenAI policy also determine ChatGPT adoption. Further exploration of ChatGPT use and adoption is necessary so as to fully maximize utilization of such novel technology. While the field of the academe is seen to be leading, further analyses are required to understand contrasting results among the studies. Aside from that, given the moderating effect of policy, academic institutions should consider providing guidelines on use of ChatGPT as it affects use and adoption among students. Further preliminary investigation

must be done under sectors concerning the economy. Lastly, TAM and UTAUT/UTAUT2 are recommended theoretical frameworks that can be used in understanding adoption factors. To further strengthen the understanding, incorporation of extension constructs is imperative to holistically study the determinants of ChatGPT adoption.

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