

## CONTEXTUALIZING FACTORS INFLUENCING TUTORS' ADOPTION OF ONLINE TUTORING BASED ON TECHNOLOGY ACCEPTANCE MODEL

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### ABSTRACT

Online education has experienced substantial growth, driven by technological advancements and expanded internet accessibility. Many private academic institutions have transitioned to online platforms, offering diverse educational services tailored to meet varying student needs. Despite this shift, research on online education has largely concentrated on higher education, leaving a gap in understanding its impact within school-level settings. This study addresses this gap by focusing on online private tutoring (OPT) by examining the factors influencing the tutors' intention in adopting it. Specifically, this study investigates how tutors' technological skills and communication self-efficacy impact their perceived usefulness and ease of use of online education platforms, drawing upon the Technology Acceptance Model (TAM). The study hypothesizes that tutors' technological skills and communication self-efficacy are associated with their perceived usefulness and ease of use of OPT, respectively, and further influencing their intention to adopt OPT for teaching and learning. Data were collected from a survey of 150 tutors engaged in OPT, with analyses conducted using SPSS version 25 and SmartPLS 4.0. Results indicated that, while all factors were moderate in influence, technological skills did not significantly impact perceived usefulness. Communication self-efficacy showed a moderate effect on perceived usefulness, while perceived ease of use had a strong impact, suggesting that ease of use leads tutors to view OPT as beneficial for instruction. Both technological skills and communication self-efficacy moderately influenced perceived ease of use. The model demonstrated moderate predictive power in assessing the adoption of OPT among tutors. These findings contribute to contextualizing TAM within online education, offering empirical insights into the factors that influence tutors' adoption of digital teaching and learning strategy. This study provides valuable implications for policymakers and educational leaders aiming to enhance online learning experiences, supporting the continued adaptation of TAM for educational contexts.

**Keywords:** Communication self-efficacy, education 5.0, online education, private tutoring, technology acceptance model, technological skills, tutoring.

## INTRODUCTION

Education 5.0 represents a transformative approach to education that integrates advanced technologies, personalized learning experiences, and a focus on human-centered education (Rane, Choudary, Rane, 2024). The core of Education 5.0 lies in the integration of technology into the learning process, which facilitates personalized and adaptive learning experiences (Rane et al., 2024). This integration is not merely about using technology as a tool but involves rethinking pedagogical approaches to leverage technology effectively in teaching and learning practices (Al-Emran & Al-Sharafi, 2022). Furthermore, the increasing competition in the educational sector has prompted various stakeholders such as parents to invest more in supplementary education, including private tutoring to ensure the success of their kids in academic (Yung & Zeng, 2022). This trend is particularly pronounced among upper-middle-class families who are willing to allocate significant resources to ensure their children have access to elite educational opportunities (Goudeau, Sanrey, Stanczak, Manstead & Darnon, 2021). The normalization of private tutoring to enhance academic performance has led to a surge in demand for tutoring services, as families seek to supplement formal education with additional support. Hence, with the potential nature of online education, where the teaching and learning process can happen anywhere, either synchronously or asynchronously, and demand entailed by most parents, making it a valuable business opportunity in the education industry.

Besides, the scenario of shifting face-to-face into online education as alternative during the pandemic of COVID-19 has seen that obvious transformation into education landscape (Paudel, 2020). Online education alternatively identified by the term online learning or distance learning, leverages information and communication technology (ICT) to facilitate interaction between students and tutors, primarily focusing on “nontraditional students” such as full-time workers or those unable to attend classes in person (Berg & Simonson, 2024). Online education has been studied and implemented as a complementary approach to conventional face-to-face classroom learning since 1990 (Kang, Zhang & Kang, 2022). While online education is often implemented within formal educational systems, the principles and technologies used have similarly been adopted in the realm of online private tutoring, where digital platforms enable personalized, flexible learning experiences beyond traditional classroom settings.

Online private tutoring (OPT), defined as the use of digital platforms to provide personalized instruction outside traditional school settings, leverages various technological tools to deliver learning experiences (Ventura & Jang, 2010). In this study, online education refers to the OPT that is conducted virtually or internet-based tutoring platforms which provide real-time or recorded lessons, often through one-on-one sessions or interactive virtual classrooms. This approach is particularly popular in countries in Asia such as Indonesia, South Korea, and Malaysia, where the high demand for supplementary education has led to the proliferation of such services (Persada et al., 2021). OPT in nature were conducted in cyber-space, transcending geographical barriers as it allows for borderless participation of audience (Andrin et al., 2024).

According to a study, approximately 80% of the elementary and secondary students have been participating in the OPT in South Korea, which has become a significant aspect of the educational landscape, offering individualized learning experiences and advanced technological tools that enhance student engagement and satisfaction (Jung, Bang & Kim, 2022). One of the key players for OPT to happen is tutors as tutors as they play a critical role in shaping the effectiveness of OPT by guiding the learning process, facilitating discussions, and ensuring that learning objectives are met. Their technological skills, and ability to foster an engaging learning environment directly influence the success of OPT, thus, examining tutors provides valuable insights into how their role impacts the quality of peer tutoring, leading to more effective outcomes and implementation. The context of this study, the focus is on understanding the relation of technological skills, communication self-efficacy of tutors, the perception of its usefulness and ease of use towards the intention to use OPT which potentially can shape the future of private tutoring.

Focusing on Technology Acceptance Model (TAM), perceived usefulness and perceived ease of use are the two main beliefs that can lead to tutors’ intention to carry out OPT, meanwhile technological skills and communication self-efficacy significantly can be designated as external variables (Palanisamy & Sulaiman, 2020). Consequently, the intention to adopt OPT can be assumed as tutors consider the OPT as useful and easy to use as they possess impressive technological skills and confidence in their communication self-efficacy (Persada et al., 2021). OPT is expanding rapidly, fueled by advances in technology and the increasing

reliance on digital platforms for education, and it has also become thriving in the education industry. In South Korea through their Megastudy and Indonesia through Ruang Guru, have gained prominence by offering extensive digital content and interactive learning environments (Persada et al., 2021).

Research indicates that tutors' self-efficacy directly correlates with their willingness to adopt and integrate technology into their teaching practices (Peiris, 2024). The role of tutors' self-efficacy is critical in OPT, indicating that tutors' confidence in using technology significantly influences students' attitudes and engagement (Elsayed & Elsayed, 2024). Competent tutors can effectively facilitate learning and resolve technical issues, enhancing students' overall experiences thus there is a need for tutors to be proficient in using virtual classrooms, managing digital content, and engaging students in online learning environments (Jung et al., 2022). Apart from that, communication dynamics in OPT can be challenging to navigate, as the online environment often limits the visibility of body language and paralinguistic cues, which are crucial for effective interaction (Jung et al., 2022). To counter this, tutors in OPT often employ specific techniques to enhance communication such as multisensory teaching, dynamic screen composition, and the use of advanced internet technologies and tools, which can navigate the tutoring session and foster a more interactive teaching and learning experience (Jung et al., 2022).

Additionally, the development of user-friendly online learning platforms is essential, as easy-to-navigate tools allow tutors to concentrate on teaching and learning rather than troubleshooting, aligning with the TAM's emphasis on perceived ease of use as a key determinant of technology acceptance (Elsayed & Elsayed, 2024; Peiris, 2024). The increasing reliance on digital platforms for education and the gaps in accessibility and effectiveness necessitate further investigation into the factors influencing the adoption and continued use of OPT. Understanding these factors, especially technological skills, communication self-efficacy, towards the intention to use OPT in online education is essential for future designing interventions that can enhance the quality and accessibility of online tutoring services. Henceforth, the objectives of this study are as follows:

1. To investigate the level of tutors' technological skills, communication self-efficacy, perceived usefulness, perceived ease of use, and intention to use online private tutoring in online education practices.
2. To model out the factors which influence tutors' intention to use online private tutoring in online education practices from the perspective of technological skills, communication self-efficacy, perceived usefulness, perceived ease of use, and intention.

## LITERATURE REVIEW

### Education 5.0

The role of tutors in this new paradigm is also evolving as tutors are no longer seen merely as transmitters of knowledge but as facilitators of learning who guide students in their educational journeys (Vimal & Alexander, 2023). This shift requires ongoing professional development and support for tutors to effectively implement innovative teaching strategies. Education 5.0 is well-suited to the realm of online private tutoring (OPT), as it emphasizes personalized learning, technological integration, and the development of essential skills for the 21st century (Rane et al., 2024). The increasing demand for online tutoring services, particularly among upper-middle-class families, underscores the need for tutors to innovate and enhance their offerings (Goudeau et al., 2021). By leveraging technology to create engaging and effective learning experiences, online private tutoring seems to be aligned with the transformative goals of Education 5.0. This alignment does not only benefit students but also fosters a culture of continuous improvement and professional development among tutors.

One of the primary aspects of Education 5.0 is its emphasis on personalized learning. In the realm of OPT, this personalization is facilitated by technology, which allows tutors to tailor their teaching methods and materials to meet the unique needs of each student. Research by Glotave, Samoylenko, Zharko, Georgiadi and Shevchenko (2022) indicates that personalized tutoring can significantly enhance student engagement and academic performance. The integration of technology in OPT also requires tutors to develop essential skills to effectively implement and drive these personalized approaches. Their ability in navigating the digital nature of education by conveying their lessons using various tools is critical to be evaluated as this is their

main mode of lesson delivery. For instance, tutors can utilize digital tools to facilitate group discussions, peer feedback, and collaborative problem-solving, thereby promoting a deeper understanding of the subject matter (Hultberg, Calonge & Choi, 2021).

### **Technological Skills and Communication Self-Efficacy in Online Education Practices for Private Tutoring**

The technological skills of tutors play a crucial role in their ability to implement innovative practices. As educational technologies evolve, tutors must continuously hone their skills to effectively utilize these tools in their teaching (Vimal & Alexander, 2023). In the context of Education 5.0, where technology is a central component, tutors' technological proficiency becomes a critical factor in their ability to innovate and adapt to new educational paradigms. Online tutoring's success is highly dependent on the technological proficiency of both students and tutors. Tutors must be well-versed in navigating virtual classrooms, managing digital resources, and using interactive tools to create an engaging learning environment. These skills will not only enhance the perceived usefulness of online platforms but also make it easier for tutors to adapt to the virtual teaching settings (Jung et al., 2022). As such, it is crucial to study how technological skills influence both the perceived usefulness and perceived ease of use in adopting online tutoring practices.

Besides, the integration of technology in Education 5.0 necessitates those teachers adapt their communication styles to suit online teaching and learning nature (Enwereji, van Rooyen, Ngcobo & Musundwa, 2024). Effective online communication involves verbal interactions and non-verbal cues, such as tone, pacing, and visual aids (Jung et al., 2022). Teachers who possess strong communication self-efficacy are more likely to experiment with various online tools and techniques to enhance their interactions with students. This adaptability is essential for creating engaging and effective learning environments that align with the principles of Education 5.0.

Communication self-efficacy in the context of this study refers to a tutor's confidence in their ability to communicate effectively in an online environment, and it is crucial for maintaining the students' engagement (Elsayed & Elsayed, 2024; Peiris, 2024). Since online settings lack physical cues such as body language, clear and effective communication becomes even more vital to ensure more successful learning outcomes (Persada et al., 2021). Tutors with stronger self-efficacy are able to foster productive student interactions better. It is vital to understand how self-efficacy impacts both perceived usefulness and ease of use in the adoption of online education for tutoring.

Moreover, the role of reflection in tutors' communication self-efficacy cannot be overlooked. (Persada et al., 2021) has shown that reflective practices, such as evaluating one's communication strategies and seeking feedback from students, can significantly enhance tutors' self-efficacy. In online private tutoring (OPT), where immediate feedback may be limited, tutors who engage in reflective practices are better equipped to identify areas for improvement and adapt their communication approaches accordingly. This continuous improvement aligns with the Education 5.0 focus on lifelong learning and professional development.

Therefore, this research proposes the following hypotheses;

- H1:* Technological skills affect perceived usefulness of online private tutoring in online education.
- H2:* Technological skills affect perceived ease of use of online private tutoring in online education.
- H3:* Communication self-efficacy influences perceived usefulness of online private tutoring in online education.
- H4:* Communication self-efficacy influences perceived ease of use of online private tutoring in online education.

### **Perceived Usefulness and Perceived Ease of Use of Online Education for Private Tutoring**

Perceived usefulness and ease of use are key factors in tutors' decision to adopt online private tutoring (OPT). As outlined in the Technology Acceptance Model (TAM), when an OPT is easy to be carried out, it enhances the perception of its usefulness, as simpler platforms reduce the effort required, increasing the

likelihood of adoption (H5) (Davis, 1989). In OPT, tutors are more likely to use OPT when they find it effective and convenient for delivering the lessons (Jung et al., 2022). Systems that provide user-friendly interfaces and essential tools such as interactive whiteboards and real-time communication features are seen as both useful and easy to navigate, further encouraging tutors to adopt them in their OPT.

Therefore, this research proposes the following hypothesis;

*H5: Perceived ease of use affects perceived usefulness in online private tutoring adoption in online education.*

## Intention to Use Online Education

Tutors' willingness to use online teaching and learning for private tutoring depends on their perceptions of the online private tutoring (OPT) usefulness and ease of use. When tutors witness that OPT enhances their teaching effectiveness and simplifies the tutoring process, they are more inclined to continue using these OPT (Persada et al., 2021). Research indicates that tutors who experience benefits such as improved student engagement and personalized feedback are more likely to adopt and sustain the use of online education practices (Jung et al., 2022).

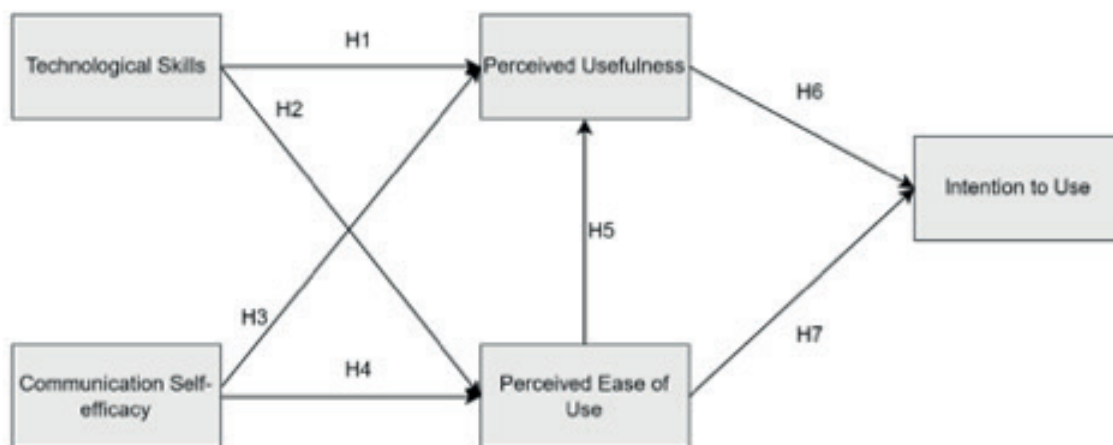
Therefore, this research proposes the following hypothesis;

*H6: Perceived usefulness affects tutors' intention to adopt online private tutoring in online education.*

*H7: Perceived ease of use affects tutors' intention to adopt online private tutoring in online education.*

## Research Framework

As this research mainly explores the relationship between technological skills, communication self-efficacy, perceived usefulness, perceived ease of use and tutors' intention to adopt online private tutoring (OPT) based on discussed hypothesis (H1-H7) above, Figure 1 illustrates the relationship between respective variables as the conceptual framework.



**Figure 1.** Research framework

## METHODOLOGY

### Sample

Participants in this study were private tutors that are teaching at various private academic centers which also have been known as tuition centers, as the focus in this research is to look upon their intention to shift towards online private tutoring. A-priori Sample Size Calculator for Structural Equation Model (SEM) (Soper, 2021) was used to determine the number of valid samples that represent the data. This calculation has considered the number of observed variables (n=23) and latent variables (n=5) in the model, an anticipated

effect size of .5, a significance level of .05, and a statistical power of .95 (Memon et al., 2020). The minimum required sample size to detect an effect was calculated at 55, with a recommended minimum of 88. However, increasing the sample size helps in reducing the impact of outliers (Weisburd, Wilson, Wooditch & Britt, 2022). Therefore, the sample size was expanded in order to strengthen the validity of the research findings. Proceeding that, through random sampling, the final sample that was used in this study was 150 tutors from various academic disciplines.

## Instrumentation

### The Operational Definition of Variables

All variables in this study refer to the relevant literature review for the operational definition and are shown in Table 1.

**Table 1.** Operational definitions

| Variables                   | Operational definitions   |
|-----------------------------|---|
| Technological skills        | Basic technical skills such as using devices (computer/laptop/smartphones), web browser, basic software (Microsoft Word, PowerPoint) and online classroom management for online private tutoring. |
| Communication self-efficacy | Tutors perceived their confidence in their ability in communicating, expressing themselves in words, voice and/or videos and their comfortability in doing so in online private tutoring.         |
| Perceived Usefulness        | The degree of tutors perceives that using online private tutoring is useful   |
| Perceived Ease of Use       | The degree to which tutors perceive online education is easy to be use.   |
| Intention                   | Predictors of the actual use of behaviors of online private tutoring.   |

## Instrumentation

The instrument used in this study consisted of two parts. The first part collected demographic data to profile the tutors including participants' genders, their tutoring syllabus focus (e.g primary, secondary or both), their professional engagement in private tutoring, specifying whether it was their full-time or part-time occupation and their familiarity to online teaching. To provide deeper insights, an open-ended item was also included to elicit tutors' reasons for opting to engage in private tutoring. These demographic data were intended to provide a comprehensive profile of the samples and were not included in the structural model analysis.

The second part of the instrument focused on collecting data related to the variables in Technology Acceptance Model (TAM) specifically perceived usefulness, perceived ease of use, and intention to adopt online private tutoring as well as several other factors such as technological skills and communication self-efficacy. The instrument was prepared using 5-point Likert scale (*1-Strongly disagree, 2-Disagree, 3-Moderate, 4-Agree, 5-Strongly Agree*). To measure the variables used in this study, established scales from previous literature were adapted to fit the context of online private tutoring (OPT). 4 items that have been used for technological skills were adapted from Watkins, Leigh and Triner (2008) that looked at the skills required to operate computers and navigate the digital environment in which an online private tutoring (OPT) also requires similar technological skills, such as the ability to manage basic software and the use of internet browsers and communication tools. The original items included statements such as "I have the basic skills to operate a computer" and "I have the basic skills for finding my way around the internet." These items were modified to reflect the specific skills needed for online tutoring, such as the ability to operate digital platforms for scheduling, communication, and instructional purposes. For example, the original item "I have the basic skills to operate a computer" was adapted to "I have the basic skills (e.g., operating a computer, using basic software like Microsoft Word or PowerPoint, managing email communication, and browsing the internet) to operate digital tools for online private tutoring." Henceforth adapting the items from Watkins et al. (2008) is suitable for assessing the ability of a tutor to use technology in the OPT context.

5 items for communication self-efficacy that were adapted from Hung (2016) look at the abilities of tutors to communicate in terms of expressing themselves in digital environments, including using video, audio, and text

platforms within OPT. Since online tutoring relies heavily on the tutors' ability to effectively communicate lesson content and engage students through virtual media, adapting Hung (2016) items is considered as suitable to be used in the context of this study. Original items, such as "I feel confident in responding to questions in online discussion," were tailored to align with the online private tutoring context. For instance, the item was adapted to "I feel confident in responding to students' questions during online private tutoring sessions (e.g., through live chat or discussion boards)." Additionally, a new adapted item, "I feel confident in expressing my ideas clearly in online private tutoring sessions (e.g., through text, audio, or video communication)," was included to address the broader range of communication channels employed in this context.

Following with the rest, 4 items that were respectively used for perceived usefulness and perceived ease of use were adapted from Davis (1989) as Davis introduced it in the theory Technology Acceptance Model (TAM). These scales assess individuals' perceptions of the effectiveness and usability of technological systems. The item "Using CHART MASTER would enhance my effectiveness on the job" was adapted to "Using online private tutoring platforms improves my teaching effectiveness (e.g., tracking student progress and managing personalized learning plans)." Similarly, ease-of-use items were contextualized, such as "Learning to operate CHART MASTER would be easy for me," which was revised to "Learning to operate online private tutoring platforms (e.g., setting up user accounts and managing lesson schedules) is straightforward for me."

Finally, 6 items for intention to continue using OPT were adapted from Kumar and Bervell (2019) where it focused on how the initial experiences with the technological tools affect future intentions. Therefore, it is appropriate to adapt from Kumar and Bervell (2019) to measure tutors' intention in the OPT context. Original items such as "I use Google Classroom to interact with online materials, peers, and instructors" were adapted to "I intend to use online tutoring platforms regularly to support my teaching activities." Additional adapted items included "I aim to continue using online tutoring platforms for designing and managing assessments, assignments, and interactive learning activities" and "I plan to explore additional features of online tutoring platforms to maximize their potential in my teaching practice."

The instruments were validated by 5 experts of content and language where several items were amended afterwards based on the experts' suggestions. To check for the item's reliability, each instrument has undergone a pilot study with a sample of 30 that resulted the item's reliability as following; Overall reliability .973. Perceived ease of use .884, Perceived usefulness .963, Intention to Use .866, Communication Self-Efficacy .875, and Technological Skills at .938. The instruments can be found as Appendix 1.

## **Data Collection and Analysis**

Data was collected using Google Forms, in which the data can be exported into different file formats and shared through social media. In order to reduce bias, the questionnaire was accessible through various mediums such as computers, laptops, smartphones, and tablets. In the introductory part of the survey, the participants were informed beforehand about their rights to refuse or withdraw from the study.

### **Identifying the Level of Online Education Adoption**

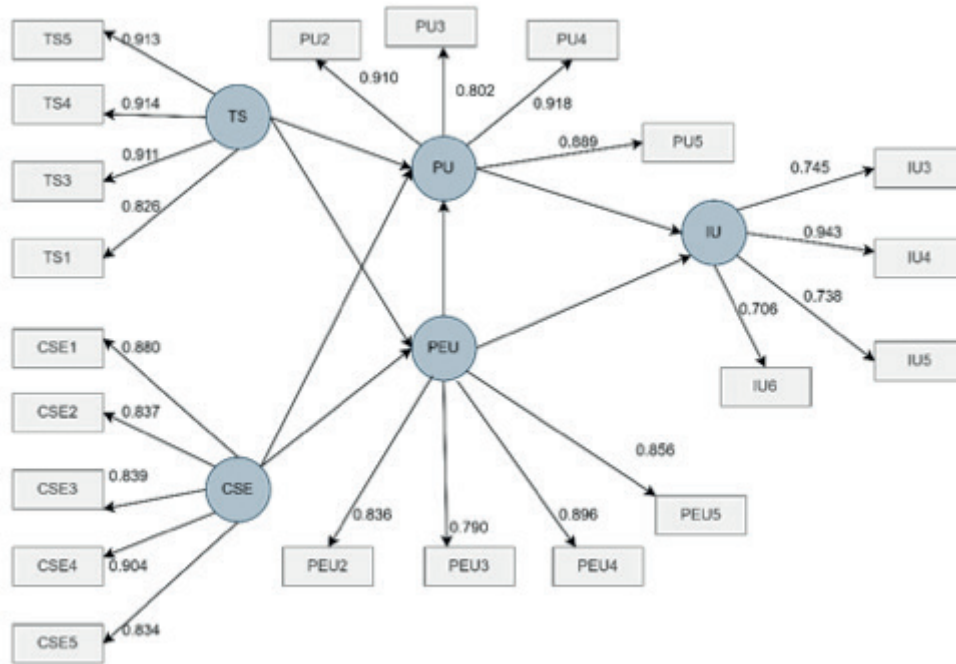
To analyze the tutors' evaluation results by variable, a few groups were categorized respectively as high, moderate, or low based on their scores. A sample scoring above +1 standard deviation (STDEV) from the mean was classified as high level, while those below -1 STDEV were classified as low level. Scores between +1 STDEV and -1 STDEV were categorized as moderate level. Data then was analyzed using SPSS ver.25.

### **Assessment of Measurement Model**

The assessment of measurement model and structural model was conducted using SmartPLS 4.0. The partial least square method (PLS-SEM) was used to explain the structure model and to analyze the interrelationship among the influencing factors. It will provide ideas and references for follow-up theoretical research and online education practice. The assessment of the measurement model involves evaluating its validity and reliability through convergent validity, discriminate validity and composite reliability. Each aspect ensures that the measurement model is robust and suitable for further analysis. The following sections detail these evaluations.

### Convergent Validity of Measurement Model

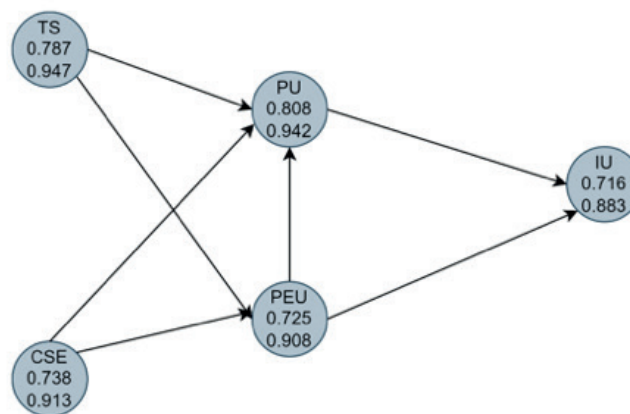
Smaller loading value (<.70) indicated that the items are less acceptable and cannot be used to measure the variable (Chua, 2020). Based on Figure 2, the loading value of item for all items for each variable have achieved a value more than .70. Hence, all the items were suitable to be used for further analysis.



**Figure 2.** Loading

TS=technological skills, CSE=communication self-efficacy, PEU= Perceived ease of use, PU= Perceived usefulness, IU=Intention to use

As shown in Figure 3, Average Extracted Variance (AVE) explained that the variables have achieved the value of >.70 which implied that the constructs explained 70% or more of the variance of the items. Technological skills 0.787, communication self-efficacy 0.738, perceived usefulness 0.808, perceived ease of use 0.725, intention to use 0.716. For Rho-A, the results also showed that all variables which have achieved value of >.70 as following; Technological skills 0.947, communication self-efficacy 0.913, perceived usefulness 0.942, perceived ease of use 0.908, intention 0.883. Data shown indicated that all variables have achieved convergent validity and were suitable to be used for further analysis.



**Figure 3.** Average Extracted Variance (AVE) and Rho-A

TS=technological skills, CSE=communication self-efficacy, PEU= Perceived ease of use, PU= Perceived usefulness, IU=Intention to use

### Discriminate Validity of Measurement Model

Fornell-Larcker has been used to evaluate the discriminate validity. For Fornell-Larcker, the assessment is done by comparing the amount of the variance captured by the variable (AVE) and the shared variance with other variables. It is achieved when the square root ( $\sqrt{\text{AVE}}$ ) of the AVE value of latent variable is larger than its correlation with any other latent variables in the model (Chua, 2020). The variables used in the context of this research have achieved discriminant validity, as per represented in Table 2.

**Table 2.** Fornell-Larcker value

|     | IU    | CSE   | PEU   | PU    | TS    |
|-----|-------|-------|-------|-------|-------|
| IU  | 0.846 |       |       |       |       |
| CSE | 0.507 | 0.859 |       |       |       |
| PEU | 0.555 | 0.660 | 0.851 |       |       |
| PU  | 0.512 | 0.554 | 0.719 | 0.899 |       |
| TS  | 0.567 | 0.748 | 0.672 | 0.559 | 0.887 |

### Composite Reliability of Measurement Model

Composite reliability (CR) is used to identify the internal consistency which measured a latent variable's overall reliability. According to Chua (2020), a latent variable has achieved its composite reliability if it obtains the value  $\geq .70$ . Meanwhile, Cronbach's alpha is used to measure the reliability of the items individually in each latent variable. The Cronbach's alpha is achieved if the value is  $\geq 0.70$  (Chua, 2020). From Table 3, the CR of all the variables have achieved  $\geq .70$  with intention to use .910, communication self-efficacy .934, perceived ease of use .929, perceived usefulness .955 and technological skills .957. Besides, Table 3 also shows the Cronbach's alpha value for all the variables that have achieved a value of  $\geq .70$  with intention to use .910, communication self-efficacy .932, perceived ease of use .929, perceived usefulness .955 and technological skills .957.

**Table 3.** Composite Reliability and Cronbach's alpha

| Variables                   | Composite Reliability | Cronbach's alpha |
|-----------------------------|-----------------------|------------------|
| Intention to use            | 0.910                 | .910             |
| Communication self-efficacy | 0.934                 | .932             |
| Perceived ease of use       | 0.929                 | .929             |
| Perceived usefulness        | 0.955                 | .955             |
| Technological skills        | 0.957                 | .957             |

### Assessing the Structural Model

In assessing the structural model, four main coefficients (i. Regression weight,  $\beta$ , ii.  $R$  square  $R^2$ , iii.  $f$  square  $f^2$ , iv. Predictive relevance,  $Q^2$ ) were used to interpret the relationships.  $\beta$  represents the strength of the relationship between variables in a model. A value of  $\pm 1.0$  shows a strong connection, with  $+1.0$  demonstrated a positive relationship and  $-1.0$  indicates a negative one. A value of 0 means there is no relationship between the variables.  $R^2$  is the coefficient of determination, representing how much influence all of the independent variables have on the dependent variables. According to Chua (2020) and Hair et al. (2014), an  $R^2$  value of 0.25 is considered weak, 0.50 is moderate, and 0.75 is strong. The  $f^2$  coefficient helps evaluate the impact of each independent variable on the dependent variables. As noted by Chua (2020), values of 0.05 indicate a small effect, 0.20 a moderate effect, and 0.35 a large effect.

Stone-Geisser's  $Q^2$  (Geisser, 1974; Stone, 1974) shows how well the independent variables predict the dependent variables. If  $Q^2$  is greater than 0, it essentially means that the model has a good predictive power. A  $Q^2 > 0$  confirms that the independent variables are useful for predicting the dependent variables (Hair et al., 2014). Table 4 indicates the cut-off value for assessing the structural model.

**Table 4.** Cut-off value

| Dimensions        | Benchmark  |
|-------------------|--|
| 1. $\beta$        | 0 and $\pm 1.0$  |
| 2. R <sup>2</sup> | 0.25, 0.50, 0.75 weak, moderate, large (F. Hair Jr et al., 2014)<br>0.19, 0.33, 0.67 weak, moderate, good (Chin, 2010) |
| 3. f <sup>2</sup> | 0.05, 0.20, 0.35 small, moderate, large (Chua, 2020)   |
| 4. Q <sup>2</sup> | >0, 0.02, 0.15, 0.35 low, moderate, high (Chin, 2010)  |

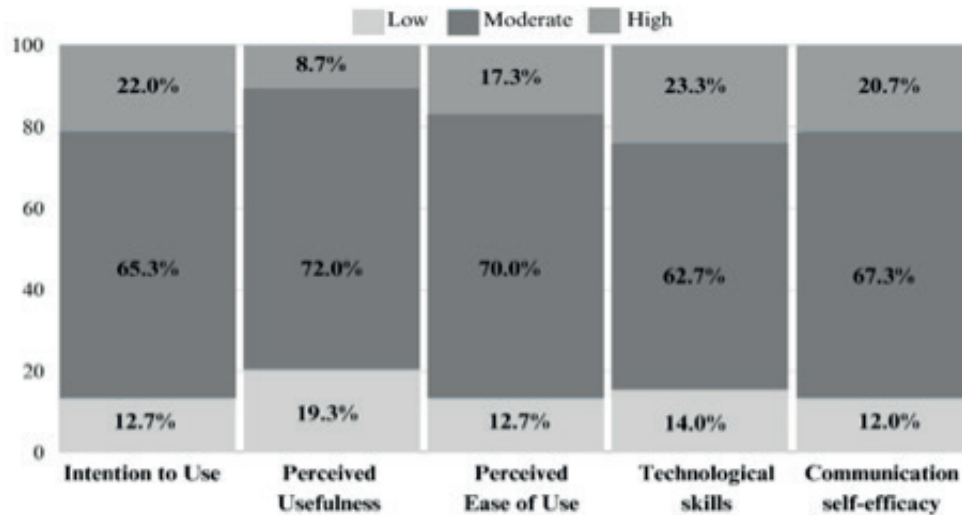
## RESULTS

### Demographic of the Samples

The samples included n=37 male and n=113 female tutors. Regarding their teaching focus, n=79 tutors worked across primary and secondary syllabi, n=42 focused exclusively on secondary school, and n=29 specialized in tutoring secondary school students. All participants had prior experience with online teaching. Of the 150 tutors, none reported being unfamiliar with online teaching (n=0), while n=93 participants indicated being “familiar” and n=57 reported being “very familiar” with online teaching practices. In terms of their professional engagements, n=93 of the samples worked as private tutors on part-time basis, while n=57 tutoring as their primary occupation. This mix of part-time and full-time tutors offered diverse perspectives on online private tutoring (OPT) adoption and provided a rich context for exploring the factors of their intention to adopt OPT. Economic pressure emerged as significant driver for adopting online private tutoring as highlighted in the open-ended responses. Many part-time tutors indicated that tutoring provided supplementary income to meet financial needs, with one tutor stating, *“online tutoring allows me to earn extra income without sacrificing my primary job responsibilities.”* Full-time tutors also emphasized economic considerations, with one of the tutors noting, *“given the current economic uncertainties, online tutoring has become a stable and essential source of income for my household.”* These insights add depths to the demographic findings, underscoring the economic motivation behind the tutor’s intention to adopt OPT. Besides, it was also found that the flexibility offered in OPT which it can be conducted in borderless location either synchronously or asynchronously. One of the tutors noted that, *“the flexibility to tutor from anywhere whether I can conduct my class in real-time or asynchronously, makes online tutoring an ideal option for balancing work and personal commitments.”* Another tutor highlighted, *“The borderless nature of online tutoring allows me to reach students across different areas, creating opportunities that wouldn’t exist if I only taught at tuition center”.* Furthermore, participants noted that conducting tutoring online enables them to accommodate a larger number of students compared to face-to-face physical sessions, which significantly increased their earning potential. One of the tutors shared, *“with online tuitions, I can reach more students at once, either through group sessions or managing back-to-back classes, which greatly helps me financially.”*

### Level of Tutors’ Online Private Tutoring Based on Each Variables

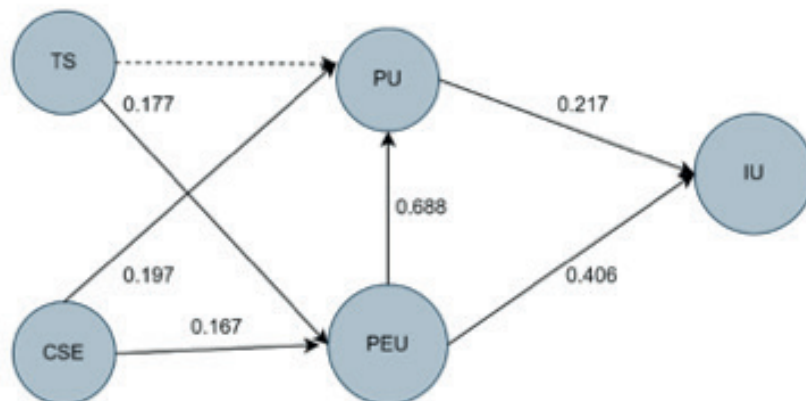
This research investigates the level of tutors’ online private tutoring (OPT) based on various factors, including technological skills, communication self-efficacy, perceived usefulness, perceived ease of use, and intention to adopt OPT. Based on Figure 4, each variable was categorized into high, moderate, and low levels. The intention to adopt OPT (65.3%, n=98), perceived usefulness (72.0%, n=108), perceived ease of use (70.0%, n=105), technological skills (62.7%, n=94), and communication self-efficacy (67.3%, n=101) appeared to be moderate. Meanwhile, with intention to use 22.0% (n=33), perceived usefulness 8.7% (n=13), perceived ease of use 17.3% (n=26), technological skills 23.3% (n=35), and communication self-efficacy 20.7% (n=31) respectively, tutors were considered as at high level. This indicates that tutors are generally capable and open to using OPT. Enhancing skills, confidence, and perceptions could help promote more widespread and effective use of these OPT.



**Figure 4.** Level of Tutors' Online Private Tutoring Based on Each Variables

### Assessment of Structural Model

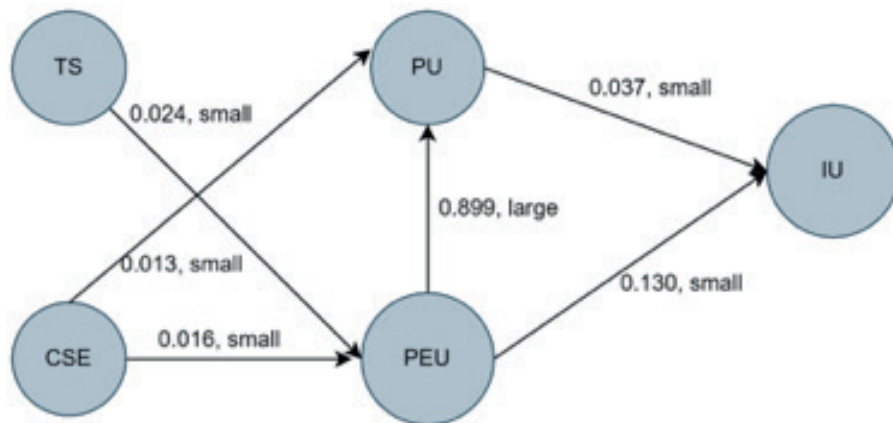
The assessment of the structural model was conducted to evaluate the relationships between the variables involved in the adoption of online private tutoring (OPT). The analysis utilized Partial Least Squares Structural Equation Modeling (PLS-SEM), and the analysis focused on key coefficients including path coefficients, effect sizes,  $R^2$  values, and predictive relevance. The path coefficients ( $\beta$ ) indicate the magnitude and direction of the relationships between the independent and dependent variables. From Table 5, it was found that technological skills are not significant factors for perceived usefulness (H1) with  $\beta = .050$  at  $p > 0.05$ . Henceforth H1 is statistically rejected. Since there is no relationship between technological skills and perceived usefulness, it was removed from the model (Figure 5) for further analysis. Meanwhile technological skills towards perceived ease of use ( $\beta = 0.177$ ,  $p > 0.05$ ), communication self-efficacy towards perceived usefulness ( $\beta = 0.190$ ,  $p > 0.05$ ), communication self-efficacy towards perceived ease of use ( $\beta = 0.167$ ,  $p > 0.05$ ), perceived ease of use towards perceived usefulness ( $\beta = 0.688$ ,  $p > 0.05$ ), perceived usefulness towards intention to use ( $\beta = 0.217$ ,  $p > 0.05$ ) and perceived ease of use towards intention to use ( $\beta = 0.406$ ,  $p > 0.05$ ) are statistically accepted and have positive influence. Henceforth H2-H7 were used for further analysis.



**Figure 5.** Path coefficients

*TS=technological skills, CSE=communication self-efficacy, PEU= Perceived ease of use, PU= Perceived usefulness, IU=Intention to use*

In Figure 6, the effect size (coefficient  $f^2$ ) of technological skills ( $f^2=0.024$ ) and communication self-efficacy ( $f^2=0.016$ ) have small effect size on perceived ease of use. Overall, these two significant factors account for 55.6% ( $R^2=.556$ ) for the overall ease of use of online private tutoring (OPT) (Figure 7). Communication self-efficacy ( $f^2=0.013$ ) has a small effect size towards perceived usefulness, but perceived ease of use has the largest effect size with  $f^2=0.889$ . Overall, these two significant factors account for 51.6% ( $R^2=.516$ ) for the overall perceived usefulness of OPT (Figure 7). The effects size of perceived usefulness and perceived ease of use towards the intention to use OPT were also small with perceived usefulness towards intention to use obtained  $f^2=0.037$  and perceived ease of use towards intention to use obtained  $f^2=0.130$ . Together, these two significant factors accounted for 33.3% ( $R^2=.333$ ) of the intention to use OPT among tutors.



**Figure 6.** Effect size,  $f^2$

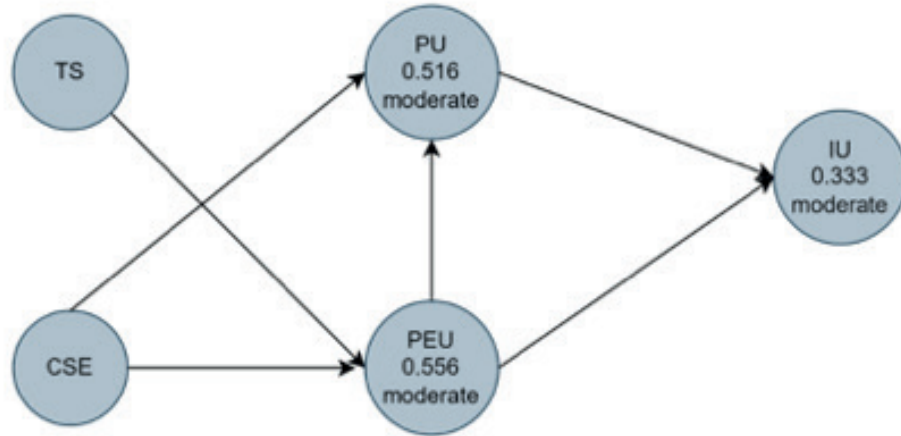
*TS=technological skills, CSE=communication self-efficacy, PEU= Perceived ease of use, PU= Perceived usefulness, IU=Intention to use*

The path coefficients,  $\beta$  and effect size,  $f^2$  are summarized in Table 5 below.

**Table 5.** Path coefficients and effects size

| Variables         | Path coefficients, $\beta$ | Effect size, $f^2$ |
|-------------------|----------------------------|--------------------|
| <b>H1</b> TS-PU   | .050, reject               |                    |
| <b>H2</b> TS-PEU  | .177, accept               | .024, small        |
| <b>H3</b> CSE-PU  | .190, accept               | .013, small        |
| <b>H4</b> CSE-PEU | .167, accept               | .016, small        |
| <b>H5</b> PEU-PU  | .688, accept               | .899, large        |
| <b>H6</b> PU-ITU  | .217, accept               | .037, small        |
| <b>H7</b> PEU-ITU | .406, accept               | .130, small        |

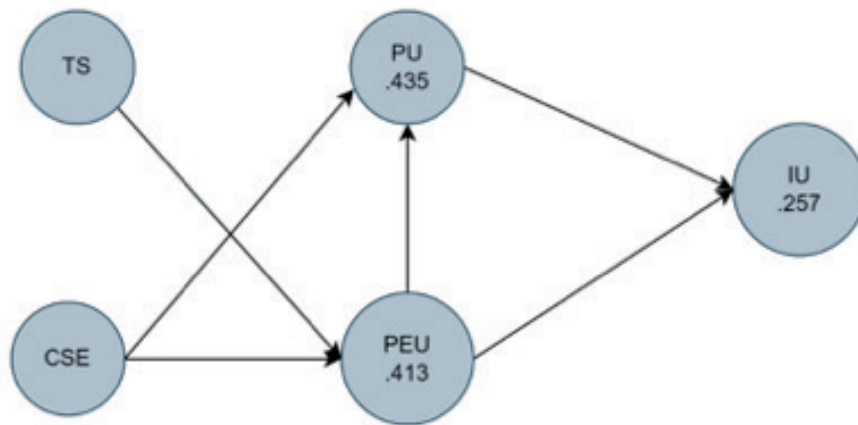
Figure 7 below illustrates the total effects size,  $R^2$  of technological skills, communication self-efficacy, perceived usefulness, perceived ease of use, and intention to use OPT. The moderate  $R^2$  values show that the model adequately explains the relationships among the variables; however, it may indicate additional factors influencing tutors' adoption of OPT.



**Figure 7.** Total effect size,  $R^2$

*TS=technological skills, CSE=communication self-efficacy, PEU= Perceived ease of use, PU= Perceived usefulness, IU=Intention to use*

The Predictive Relevance ( $Q^2$ ) values (Figure 8) show the model's predictive capability for the dependent variables.  $Q^2$  value greater than zero indicates that the independent variables enhance the prediction of the outcome. In this research, the  $Q^2$  values were categorized as follows; Intention to Use (IU):  $Q^2 = 0.257$  (moderately predictive), Perceived Usefulness (PU):  $Q^2 = 0.435$  (highly predictive), and Perceived Ease of Use (PEU):  $Q^2 = 0.413$  (highly predictive). The results for Perceived Usefulness and Perceived Ease of Use indicate that both variables play a significant role in influencing tutors' intentions to adopt OPT. The findings indicate that the model can effectively predict tutors' intentions to use OPT based on perceived usefulness and ease of use.

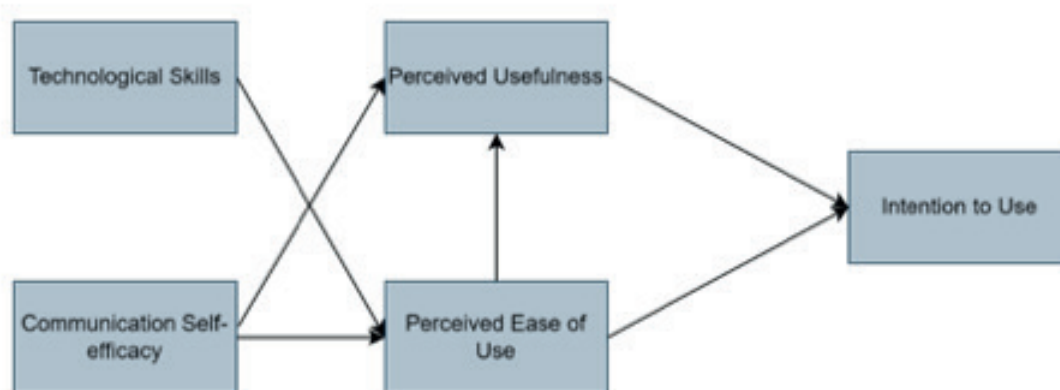


**Figure 8.** Predictive Relevance,  $Q^2$

*TS=technological skills, CSE=communication self-efficacy, PEU= Perceived ease of use, PU= Perceived usefulness, IU=Intention to use*

The  $Q^2$  results, especially for perceived usefulness and ease of use, suggest that focusing on improving user experience could significantly enhance adoption rates. The data also highlights the importance of improving user engagement to make online tutoring tools easier to navigate and use. This research has found that the ease of OPT plays a crucial role in establishing adoption. Additionally, the assessment of the structural model state that perceived ease of use and communication self-efficacy significantly influence perceived usefulness and the intention to adopt OPT, highlighting the importance of user-friendly design and effective communication in fostering tutors' adoption of OPT.

The final model (Figure 9) explains the relationships between key variables that influence tutors' adoption of OPT. In summary, the research highlights the key factors influencing tutors' adoption of OPT, based on the Technology Acceptance Model (TAM). Technological skills and communication self-efficacy indirectly influence tutors' intention to adopt OPT. Perceived ease of use and usefulness significantly shape tutors' beliefs about the effectiveness of OPT, directly influencing their intention to adopt OPT for teaching and learning.



**Figure 9.** Final model

## DISCUSSION

### Level of Tutors' Online Private Tutoring Based on Each Variables

The demographic data collected in this study were utilized solely for profiling purposes to provide context and understanding of the samples. These data, including gender distribution, teaching focus, online teaching familiarity and professional engagement were not analyzed for their direct influence on the structural model. Profiling the participants enhancing the generability of the findings within the context of online private tutoring (OPT). The economic significance likely heightened their intention to adopt OPT. This is because, most tutors intend to use OPT as the source to improve their income stability. These motivations align with the TAM framework, wherein perceived usefulness is influenced by practical benefits such as increased earning potential and scheduling flexibility. Furthermore, the ability of tutoring from anywhere, both synchronous and asynchronously enhances perceived ease of use by reducing the logistic barriers. Participants' ability to accommodate larger student groups also underscores how flexibility contributed to financial viability.

Ultimately, this study did explore tutors' engagement with OPT across technological skills, communication self-efficacy, perceived usefulness, perceived ease of use, and intention to adopt OPT. This study advances the TAM framework by integrating Technological Skills and Communication Self-Efficacy as external variables, contextualizing their roles within Education 5.0. Specifically, Communication Self-Efficacy emerged as a critical determinant of perceived ease of use and usefulness, underscoring the need for targeted training in online communication strategies. These findings suggest that TAM can effectively guide the adoption of emerging technologies in personalized, technology-driven learning environments. Results indicate moderate engagement across all dimensions, providing a foundation for further support and development in these areas.

Tutors exhibit foundational technological skills necessary for basic OPT tasks, such as using digital platforms, software, and navigation (Choi & Chung, 2021; Mayantao & Tantiado, 2024; McMillan et al., 2024). However, only a few demonstrated advanced competencies, suggesting the need for more targeted professional development in interactive tools and online management (Benedicto et al., 2023). The moderate effect of technological skills on perceived ease of use ( $\beta = 0.177$ ) suggests that while these skills help tutors navigate the platforms, their direct impact on perceived usefulness is limited ( $\beta = 0.050$ , rejected). This emphasizes the importance of enhancing technological skills not just for usability but also for improving tutors' perceptions of the platform's effectiveness (Mayantao & Tantiado, 2024).

Communication self-efficacy significantly impacts both perceived ease of use and perceived usefulness, reflecting the importance of tutors' confidence in their ability to communicate effectively online (Ibrahim & Shiring, 2022). The challenges of online communication such as limited body language, tone, and visual cues (Jung et al., 2022) highlight the need for improved skills and strategies using tools like video conferencing and collaborative platforms (Enwereji et al., 2024; Jung et al., 2022). This aligns with the model's finding that communication self-efficacy has a moderate effect ( $\beta = 0.167$ ), which can be enhanced through targeted training.

Tutors view OPT as moderately useful but may not fully appreciate its potential for personalized learning and progress tracking (Rane et al., 2024; Ventura & Jang, 2010). Increasing awareness of these benefits could improve the perception of OPT's usefulness, aligning with the findings that perceived ease of use is a major driver of perceived usefulness ( $\beta = 0.688$ , large effect,  $f^2 = 0.899$ ) (Palanisamy & Sulaiman, 2020). This insight suggests that efforts to improve the platform's usability could lead to a stronger belief in its overall value.

The perceived ease of use also scored moderately, indicating room for improvement in system design. Simplified navigation and better-integrated tools could reduce barriers to adoption (Utami et al., 2021). The strong relationship between perceived ease of use and perceived usefulness further supports this argument, where a user-friendly platform is crucial for enhancing the perception of its utility.

Finally, moderate intention to adopt OPT reflects cautious optimism. Strengthening tutors' technological skills, communication self-efficacy, and enhancing the ease of use and usefulness perceptions could foster greater adoption (Herawati et al., 2022).

### **Factors of Online Private Tutoring (OPT) Adoption**

The study, grounded in the Technology Acceptance Model (TAM), identifies five factors influencing OPT adoption: technological skills, communication self-efficacy, perceived usefulness, perceived ease of use, and intention to adopt OPT (Liu & Ma, 2023). Technological skills have an indirect influence on adoption through perceived ease of use, with tutors who are more skilled in technology finding OPT platforms more manageable and easier to navigate (Luik & Taimalu, 2021; Marikyan & Papagiannidis, 2023). Additionally, the rapid development of platforms like MOOCs, Moodle, e-learning, flipped learning, and blended learning has facilitated OPT adoption (Abuhassna et al., 2023). However, the lack of direct impact of technological skills on perceived usefulness ( $\beta = 0.050$ , rejected) suggests that additional factors, such as the ease of use of the platform, play a more significant role in shaping tutors' perceptions of the technology's value.

Communication self-efficacy significantly impacts both perceived ease of use and perceived usefulness, reflecting the importance of tutors' confidence in their ability to communicate effectively online (Ibrahim & Shiring, 2022). Tutors' belief in OPT's ability to enhance teaching effectiveness further drives adoption (Zobeidi et al., 2023). The analysis also suggests that tutors perceive OPT as effortless to use, particularly when platforms are designed intuitively (Mohd Amir et al., 2020). Perceived ease of use positively affects usefulness, aligning with TAM's premise that ease of use predicts usefulness (Lin & Yu, 2023). This aligns with the model's finding that communication self-efficacy has a moderate effect ( $\beta = 0.167$ ), which can be enhanced through targeted training.

Perceived ease of use is a major determinant of perceived usefulness, with a large effect size ( $\beta = 0.688$ ,  $f^2 = 0.899$ ), reinforcing the central role of intuitive design in technology adoption (Lin & Yu, 2023). Simplified, user-friendly platforms improve ease of use, which directly influences adoption intention (Fearnley & Amora, 2020).

Finally, the model's predictive power ( $R^2 = 0.556$  for ease of use,  $R^2 = 0.516$  for perceived usefulness,  $R^2 = 0.333$  for intention to adopt) underscores the central role of perceived ease of use and usefulness in predicting OPT adoption. The high predictive validity of these constructs ( $Q^2 > 0.4$ ) confirms their importance in influencing adoption decisions and guiding the design of OPT platforms that meet tutors' needs. Simplified, user-friendly platforms can increase perceived ease of use, which directly impacts adoption intention (Fearnley & Amora, 2020). By addressing these factors, adoption rates can be improved.

## IMPLICATIONS AND CONTRIBUTIONS

### Implication and Contributions of the Study towards Contextualizing Technology Acceptance Model (TAM)

This research contributes to the growing literature of technology-enhanced teaching and learning in the context of online private tutoring (OPT) which also aligned with the framework of Education 5.0 that intertwined between tutors as tutors' knowledge and technological skills with the Technology Acceptance Model (TAM) with it perceived usefulness, perceived ease of use and intention. The research provides empirical evidence that Perceived Usefulness (PU) and Perceived Ease of Use (PEU) are key variables for the effective adoption of educational technology within the TAM framework. This study also clarifies the role of tutors' communication self-efficacy (CSE) and technological skills (TS) in shaping their perceived ease of use of online private tutoring (OPT). This is particularly important in the context of Education 5.0 where the effective use of technology is seen as key driver of student-centered and personalized learning. Education 5.0 emphasizes personalized learning, the integration of cutting-edge technologies, and the reimagining of educational practices to better prepare students for the future workforce. By examining how teachers' skills and communication affect the adoption of technology in this context, the research offers a theoretical foundation for further exploration of Education 5.0. This contribution is particularly valuable as it addresses a relatively under-researched area, laying the groundwork for future studies on the operationalization of Education 5.0 in real-world educational settings.

While improving technical proficiency is significant, this study indicates that TS and CSE are critical factors that influence tutors as tutors' perceived ease of use of technology-enhanced teaching methods. This study presents essential quantitative data that supports the advancement of the TAM model. Additionally, the findings indicate that tutors can utilize OPT more effectively CSE and PEU are enhanced, as both directly impact confidence in utilizing the platform for effective interaction with learners. By improving the ability to engage in meaningful interactions on OPT, CSE significantly contributes to improving both teaching outcomes and the willingness to adopt OPT. While TS are significant, the enhancement of perceptions regarding the PU of online education platforms remains limited without addressing the role of communication efficacy. There is a necessity for communication between tutors and students. As for OPT, where tutors and students can communicate face-to-face or by electronic means, communication is the most effective, and its form, namely the communicable technologies, can aid subject matter perceptions and task performance. This indicates that in the lens of technology, developers must prioritize the creation of user-friendly and intuitive educational platforms. Tutors are more willing to utilize platforms that are easy to navigate and logical in design. Developers should provide tools that are both user-friendly and instill confidence in tutors when engaging in online communication. This will enhance the usability of technology for tutors with varying levels of technological proficiency.

### Practical Implications and Contributions for Stakeholders

For tutors, the findings highlight the importance of continuous professional development, specifically focusing on enhancing their technological competencies, as tutors' perceived ease of use of technology is strongly tied to their technological proficiency. This underscores the need for educational institutions to provide ongoing training and development opportunities that address these gaps, enabling teachers to confidently adopt and utilize new technologies in their teaching practices. Tailored training programs should be developed to address gaps in their knowledge and skills. Such programs would empower tutors to confidently implement technology-enhanced teaching strategies, which are crucial for engaging students in Education 5.0 environments.

Since online private tutoring (OPT) is primarily business-oriented, it is essential for the key stakeholders establish supportive environments by ensuring the availability of technological infrastructures and robust professional development opportunities within their institutions. Moreover, institutional decision-makers should consider involving teachers in the decision-making process concerning technology adoption, thus ensuring that top-down decisions align with teachers' practical needs and concerns. Besides, the findings underscore the importance of user-centered design in OPT, therefore, developers should prioritize the implementation of intuitive interfaces and robust communication tools to enhance the perceived ease of use of OPT.

As OPT involves tutors and students, the implications of this study extend to students' learning experiences. Improved tutors' competence in technology-enhanced teaching can lead to more engaging, interactive, and personalized learning experiences, ultimately contributing to better educational outcomes. Policymakers must support professional development initiatives focusing on both technological proficiency and online communication skills to empower tutors in adopting OPT. This is particularly critical as Education 5.0 places a strong emphasis on personalized and technology-driven learning environments, which rely heavily on the effective use of digital tools by tutors.

## **LIMITATIONS AND RECOMMENDATIONS FOR FUTURE WORKS**

The research focused on technology skills and communicative self-efficacy as significant factors affecting the adoption of online private tutoring (OPT) as the mode of online education. While providing valuable insights into tutors' adoption of technology-enhanced instruction within OPT through the Technology Acceptance Model (TAM), the diversity of educational environments may not be entirely addressed. Considering the significance of these factors, the limitations that emerged during the research process must be acknowledged. Next, the research primarily examines Perceived Usefulness (PU) and Perceived Ease of Use (PEU). While the research indicates that Perceived Usefulness (PU) and Perceived Ease of Use (PEU) are pivotal elements affecting OPT, other elements of the TAM, such as social impact or conducive environments, may not have been thoroughly examined, which are factors that influence tutors' decisions to embrace technology. Furthermore, tutors' adoption behaviors may be influenced by external factors like school culture, peer opinions, and student feedback, which are difficult to quantify. In response, future research should add more dimensions gradually instead of including all variables at once. Initially, the focus could be on social influence, studying how colleagues, leaders, and students affect tutors' technology use. Subsequently, facilitating factors may be used to analyze the role of resource support.

Additionally, the research focuses on tutors' perceptions, skills, and adoption behaviors without including the perspectives or feedback of other stakeholders, such as administrators and technology support staff, who also play crucial roles in facilitating the adoption of technology-enhanced teaching and learning. Moreover, tutors' backgrounds, particularly in terms of professional development opportunities, institutional support, and access to resources, may significantly impact their engagement in adopting online learning tools. For instance, tutors working in well-supported institutions may have better access to technology, training, and a collaborative environment. Deeper insights could be obtained if factors such as institutional policies and organizational culture were considered throughout the necessary arrangement on individual tutors. However, gathering information from additional stakeholders, such as technology teams and administrative, would be necessary to include complicated elements like organizational culture and policies. Consequently, more time and resources would be required for coordination, increasing the workload. Therefore, future research could consider collaborating with different research teams or experts to conduct a more comprehensive model of online education adoption.

Moreover, the limitation resulted from the fact that tutors came from multiple generations, each of whom held varying degrees of confidence and expertise with technology. Younger tutors typically showed higher proficiency in digital tools due to greater exposure, whereas older tutors often demonstrated lower confidence in using technology. Sorting and evaluating teachers by age groups would have required more comprehensive demographic data than what was provided by the study. Consequently, finding patterns in technology adoption and usage across generations was challenging. Additionally, the research did not establish specific training needs or support mechanisms for tutors from various generational backgrounds. Future research should gather more comprehensive demographic data to clarify the impact of age and experience on technology utilization in educational settings.

The demographic data highlights financial motivations and the flexibility of OPT as significant factors influencing tutors' intention to adopt online platforms. Future studies should build on these findings by examining financial incentives, platform flexibility, and familiarity with OPT shape tutors' adoption behaviors. Additionally, collecting more comprehensive demographic data, such as age and teaching experience, could deepen understanding of their impact on technology utilization in educational contexts, offering richer insights into the interplay between user characteristics and technology adoption.

## CONCLUSION

This research provides significant insights into the factors influencing tutors' adoption of online private tutoring (OPT), utilizing the Technology Acceptance Model (TAM) as a framework. This demonstrates that communicative self-efficacy has a more significant influence than technological skills on the use of OPT. Within the Education 5.0 framework, tutors who effectively enhance their communication self-efficacy can engage students more effectively when using OPT. Perceived Usefulness (PU) and Perceived Ease of Use (PEU) are crucial factors in the successful adoption of educational technology within this framework, establishing fundamental principles of the Technology Acceptance Model.

Additionally, tutors are more willing to utilize OPT when it is seen as user-friendly. Emphasizing user-centered design in educational technology adoption is essential for developers. While tutors typically demonstrate competence and a willingness to embrace online tutoring systems, improving their confidence is necessary.

Ultimately, the effective integration of online private tutoring into educational practices relies on collaboration among tutors, technology developers, and policymakers. Collaborative efforts among stakeholders can create an environment that supports online learning, benefiting both tutors and students for a more effective and engaging educational experience in the digital age.

To conclude, this research contributed to the progression of TAM by highlighting the roles of external variables in influencing adoption within Education 5.0. The study demonstrates the importance of Communication Self-Efficacy in shaping perceptions of OPT's ease of use and usefulness. Future research should explore additional TAM variables to provide a more comprehensive understanding of technology adoption.

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## Appendix: Questionnaire

|                             |   |
|-----------------------------|---|
| Technological Skills        | <ul style="list-style-type: none"> <li>I have the basic skills (e.g., operating a computer, using basic software like Microsoft Word or PowerPoint, managing email communication, and browsing the internet) to operate digital tools for online private tutoring.</li> <li>I am confident in navigating online platforms (e.g., learning management systems, video conferencing tools) to manage private tutoring sessions.</li> <li>I can effectively use online communication tools (e.g., email, chat applications, collaborative tools like Google Drive) for tutoring activities.</li> <li>I can conduct interactive online conversations with students using digital platforms (e.g., Zoom, Microsoft Teams, WhatsApp).</li> </ul>   |
| Communication Self-efficacy | <ul style="list-style-type: none"> <li>I feel confident in responding to students' questions during online private tutoring sessions (e.g., through live chat or discussion boards).</li> <li>I feel confident in expressing emotions and humor through online communication tools (e.g., emojis, GIFs, and creative written responses).</li> <li>I feel capable of using interactive features (e.g., live chat, breakout rooms) to foster student engagement during online tutoring.</li> <li>I feel confident in posting queries and fostering discussions in online tutoring platforms (e.g., through online forums or live discussions).</li> <li>I feel confident in expressing my ideas clearly online private tutoring sessions (e.g., through text, audio, or video communication).</li> </ul>      |
| Perceived Usefulness        | <ul style="list-style-type: none"> <li>Online private tutoring enhances my efficiency as a tutor (e.g., allowing flexible scheduling and real-time feedback).</li> <li>Using online private tutoring platforms improves my teaching effectiveness (e.g., tracking student progress and managing personalized learning plans).</li> <li>Conducting online private tutoring makes it easier to manage teaching responsibilities (e.g., automating administrative tasks and streamlining lesson delivery).</li> <li>I find online private tutoring platforms beneficial for delivering lessons (e.g., providing interactive tools such as whiteboards and quizzes).</li> </ul>   |
| Perceived Ease of Use       | <ul style="list-style-type: none"> <li>Learning to operate online private tutoring platforms (e.g., setting up user accounts and managing lesson schedules) is straightforward for me.</li> <li>I find online private tutoring platforms (e.g., integrating multimedia resources and interactive tools) flexible and easy to use.</li> <li>I can quickly become proficient in managing online private tutoring sessions (e.g., conducting virtual classes, sharing resources, and managing assessments).</li> <li>I find the tools and features of online private tutoring platforms (e.g., video conferencing tools and virtual whiteboards) user-friendly.</li> </ul>   |
| Intention to Use            | <ul style="list-style-type: none"> <li>I intend to use online tutoring platforms regularly to support my teaching activities.</li> <li>I plan to incorporate online tutoring platforms into my teaching methods to improve student engagement and outcomes.</li> <li>I feel committed to using online tutoring platforms as a primary tool for delivering lessons and managing student interactions.</li> <li>I aim to continue using online tutoring platforms for designing and managing assessments, assignments, and interactive learning activities.</li> <li>I recommend online tutoring platforms as an effective teaching tool to colleagues and peers.</li> <li>I plan to explore additional features of online tutoring platforms to maximize their potential in my teaching practice.</li> </ul> |