# A Study on The Intentıons of Early Users of Metaverse As Learning Platforms Usıng The Technology Acceptance Model As Seen From In The Evıdence From PT. MarkPlus Institute

**Giovanni Alexander PANUDJU**
IPMI Business School
Giovanni.Panudju@ipmi.ac.id
Orcid: 0000-0002-2142-8036

**Amelia Naim INDRAJAYA**
IPMI Business School
amelia.naim@ipmi.ac.id
Orcid: 0000-0001-9021-902X

## ABSTRACT

In the new global economy, Metaverse has become a central issue for technology companies to transform their way of conducting professional learning and development. Metaverse is an immersive, three-dimensional, virtual, and multiuser environment online platform, allowing people to interact socially and economically, regardless of their location with a large of people. However, there is limited research being conducted in this area promising the future of web 3.0, Metaverse. This study aims to scrutinize a proposed research model for factors influencing behavioral intention to use Metaverse as a learning platform for early users at MarkPlus Institute, Indonesia. The studies used a quantitative approach and developed a research model based on an extension of the Technology Acceptance Model. The model adds the source of credibility as an independent variable and facilitating condition as a moderating variable. A survey was conducted to obtain data from 85 training participants for testing the hypothesis. SEM-PLS, a multivariate statistical analysis technique, was used to analyze responses to examine models, factors, and structural relationships and test hypotheses. The results show the Source of Credibility positively and significantly influences the perceived ease of Use.

Moreover, Perceived Ease of Use and Facilitating Condition will impact behavioral intention using Metaverse as a learning platform. The mediation analysis results show that Perceived Ease of Use has mediating effects between the Source of Credibility and behavioral intention. The results have significant empirical implications for educational institutions looking to implement the Metaverse as a new platform for learning.

**Keywords:** Metaverse, Behavioral Intention, Technology Acceptance Model (TAM), source of credibility, and facilitating condition.

## INTRODUCTION

Metaverse has emerged as a critical concern for technology companies looking to design the workplace of the future in the new global economy. Metaverse is an immersive, three-dimensional, virtual, and Multiuser Environment online, allowing people to interact socially and economically with a large of people, regardless of their location, using tools such as virtual reality (VR) and augmented reality (AR) (Díaz et al., 2020). It will revolutionize company culture, change professional learning and development, and alter the conventional office environment. A Study on Education Utilizing Metaverse for Effective Communication in a Convergence Subject (Ju Hyun, 2021) demonstrates that, compared to traditional distance learning, the difficulty of task performance is reduced by 37%, and the difficulty of lack of communication with the instructor or other learners is reduced by 42%.

This paper addresses how metaverse technology can be used in the education sector to give students a more realistic learning environment, allows them to engage with their instructors fully, and allows businesses to create new employment aids. As an illustration, the training provider can build a 3D restaurant with a kitchen and cashier to serve a non-player character who plays a customer during training for restaurant management. As a result, this study will go deeper into a study on participants' plans to adopt new technology, enhance metaverse penetration, and serve as a resource for training institutions and software developers. This study uses MarkPlus Institute as a research object as one of the most extensive training providers in Indonesia.

## 1. PROBLEM STATEMENT AND OBJECTIVE

Zuckerberg states, "In the next 5 to 10 years, Metaverse will be mainstream. When it's complete, our physical reality will merge with the digital universe." On the other hand, Metaverse in education needs a lot of time, development, and design into a mature learning method (Tlili et al., 2022). In 2022, MarkPlus Institute encourages learning in the Metaverse, but individuals are hesitant to attempt it and continue asking about the LMS platform. This phenomenon is challenging for the education industry because only a few research frameworks have been found that study students' behavioral intentions and lack of best practices from the industry to market this platform.

The initial theory for this study is the Technology Acceptance Model (TAM), which is usually used to predict user behavioral intention to use technology using perceived usefulness (PU), perceived ease of Use (PEU), and external variables. This behavioral intention to use technology will influence the actual usage of the technology in the future. The TAM model mainly uses in the education sector to predict the behavioral intention of e-learning. Kent State University professors said, "For educational developers (also called academic or faculty developers) to facilitate the change toward effective teaching and learning practices at any level. They must build trust and communicate credible expertise." Therefore, credible expertise will probably affect perceived usefulness (PU) and perceived ease of Use (PEU) as external variables (Little & Green, 2021). One of the challenges in Metaverse penetration is the technology, some studies supported the phenomenon that the absence of a facilitative

infrastructure had been cited as a significant barrier to adopting online-based learning systems (Engelbrecht, 2005; Selim, 2007).

The goal of the research framework is to examine external factors, including The Source of Credibility (SC), the moderating impact of the Facilitating Condition (FC), and the Technology Acceptance Model (TAM), which serves as the underlying theory. From that framework, we can conclude (a) to find essential factors affecting behavioral intention towards using Metaverse as the learning platform among existing online learnings user. (b) to design a strategy to increase the penetration of Metaverse as the learning platform by increasing behavioral intention to use it.

## 2. THEORETICAL FRAMEWORK

### 2.1 Theoretical background

Davis' Technology Acceptance Model (TAM) has been used in educational settings to investigate various issues, including a) student acceptance of online courses, b) course websites as practical learning tools, and c) online student communication for a class project. Moreover, Park et al. (2021) explore Metaverse using the technology acceptance model (TAM) to predict behavioral intention using it. In 2016, Fazil Abdullah and Rupert Ward established General Extended Technology Acceptance Model for E-Learning (GETAMEL) based on Davis' Technology Acceptance Model (TAM) (Humida et al., 2021).

In the education industry, the students can find many options, from expensive to affordable products that serve different market segments. Besides the price factor, the customer will look into the trainer's expertness, the provider's reputation, and the trustworthiness to conduct training because the education industry is a service business that people can not feel the product until they buy and feel it. Therefore, the element of Source of Credibility is essential when the client decides to use the vendor. The study by ((Sharif et al., 2022) shows that brand credibility help in creating positive behavioral intentions for brands. However, many companies struggle to shift from offline to online training because of improper devices and limited internet connection during Covid-19. Some companies provide a new laptop or allow employees to bring and borrow a computer into their home to increase productivity. Therefore, it is possible to increase behavioral intention to learn in a Metaverse if they have good facilitation. Humida et al., (2021) also add "facilitating condition" as a new mediating variable between perceived usefulness and perceived ease of use with behavioral intention. Based on previous research on Metaverse and Technology Acceptance Model in the education sector, the research will focus on the GETAMEL model with the source of credibility as an external variable and facilitating condition as a moderator variable to predict an individual's intention to use Metaverve as a learning platform.

### 2.2 Research hypotheses development

#### Behavioral Intention (BI)

Intention to use technology can be defined as the degree to which the user wants to use technology in the future (Joo et al., 2018). Intention to use technology is defined as "users' preference to accept or reject technology by implementing certain techniques to ensure the

continued Use of technology (Akour et al., 2022). Based on TAM (Technology Acceptance Model), intention to use was defined as "the extent to which an individual feels motivated to use the technology" (Davis, 1989). In short, based on the expert explanation, behavioral intention defines learners feeling motivated and willing to use Metaverse in the future.

**Source of Credibility (SC)**

According to Wu and Wang (2011), source credibility indicates how much the message's recipient believes in the addresser. Jee-Won Kang, and Young Namkun (2019) used TAM to study the elaboration likelihood model (information quality and source credibility) on technology acceptance theory (TAM). The research shows that credibility significantly affects Perceived usefulness (PU) and Perceived ease of Use (PEOU). Past research on the credibility of the utilization of e-learning or technology products, such as e-commerce of telemedicine, showed that the source of credibility was a significant precedent for the adoption of new technology (Chauhan, 2015; Kang & Namkung, 2019; Luan & Teo, 2011; Usman et al., 2022).

Another study by Sharif et al., (2022) shows that positive brand experience trust and credibility help create positive behavioral intentions for the brands. Another research illustrates the significant impact of credibility on the behavioral intention during the pandemic (Dang, 2022). Therefore, this study conveys the proposed hypothesis:

**H1 :** The higher (lower) Source of Credibility (SC) will impact higher (lower) Perceived Usefulness (PU) using Metaverse as a learning platform.

**H2** : The higher (lower) Source of Credibility (SC) will impact higher (lower) Perceived Ease of Use (PEOU) using Metaverse as a learning platform.

**H9** : The higher (lower) Source of Credibility (SC) will impact higher (lower) Behavioral Intention (BI) using Metaverse as a learning platform.

**Perceived usefulness (PU) and perceived ease of Use (PEOU)**

Davis defines perceived usefulness (PU) as the level to which a user thinks that running a system would enhance one's performance, and Perceived Ease of Use (PeoU) as the intensity users think that they can run a specific setup effortlessly (Davis, 1989). Both variables are basic constructs in the TAM that significantly affect the intention to use a technology (Davis, 1989). A study on the intentions of early users of metaverse platforms using the Technology Acceptance model shows Perceived Usefulness and Perceived Ease of Use (PEOU) accept the hypothesis test (Park et al., 2021). Another metaverse research in the education industry has a similar result that indicates Perceived Usefulness and Perceived Ease of Use (PEOU) have a positive direction to intention using Metaverse (Akour et al., 2022). The construct variables of the Perceived Usefulness and Perceived Ease of Use (PEOU) are likely to positively influence users' interaction with Metaverse. Furthermore, the variables also directly influence the intention to use Metaverse. Therefore, this study conveys the proposed hypothesis:

**H3** : The higher (lower) Perceived Ease of Use (PEOU) will impact higher (lower) Perceived Usefulness (PU) using Metaverse as a learning platform.

**H4** : The higher (lower) Perceived Usefulness (PU) will impact higher (lower) Behavioral Intention (BI) using Metaverse as a learning platform.

**H5** : The higher (lower) Perceived Ease of Use (PEOU) will impact higher (lower) Behavioral Intention (BI) using Metaverse as a learning platform.

**Facilitating condition (FC)**

Kamal (2020) defined facilitating conditions as adequate organizational and technical infrastructure for a user's support to adopt new technology. The successful usage of metaverse services is significantly dependent upon adequate technological infrastructure. Some studies experiment with the contextual factors as moderator variables between Perceived Usefulness (PU) and Facilitating Condition (FC) on behavioral Intention (BI), such as Technology Readiness, Technology innovativeness, or facilitating condition. It has a moderation effect between construct variables (Al-Emran et al., 2018; Ching-Ter et al., 2017; Mehta et al., 2019; Yi et al., 2003). Facilitating Condition (FC) has experimented as a moderator. A moderator variable can be either qualitative or quantitative, influencing the orientation and/or power of the interconnection between an independent/predictor and a dependent/response variable that helps to determine the external validity of relationships between variables (Baron & Kenny, 1986). Therefore, this study conveys the proposed hypothesis:

**H6** **:** How does Facilitating Condition (FC) influence Behavioral Intention (BI) to use Metaverse as a learning platform?

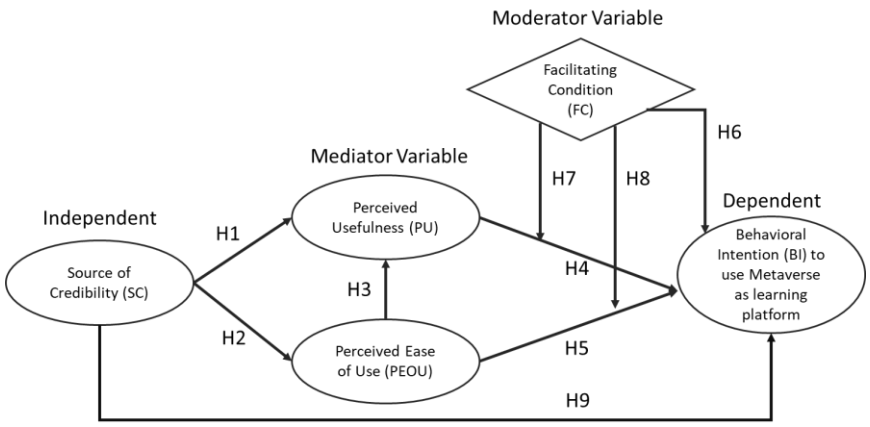
**H7** **:** How does Facilitating Condition (FC) moderate Perceived Usefulness (PU) toward Behavioral Intention (BI) to use Metaverse as a learning platform?

**H8** **:** How does Facilitating Condition (FC) moderate Perceived Ease of Use (PEOU) toward Behavioral Intention (BI) to use Metaverse as a learning platform?

## 2.3 Research hypotheses development

The behavioral intention (BI) was empirically explored utilizing the Metaverse as a learning platform in the MarkPlus Institute, Indonesia, based on nine hypotheses developed based on four variables selected from various studies.

**Figure-1:** The proposed conceptual model




**Source:** Author (2022)

## 3. METHOD

### 3.1 Data collection method

This study used JotForm to distribute online questionnaires through social media and WhatsApp groups. It will be distributed to Generation Y and Generation Z, especially the predominant audience between 13 and 24 years old, who create avatars based on the actual physical characteristics of the users (Canorea, 2021). They also have been experiencing distance learning and have registered for a MarkPlus training or event. The questionnaire contains three sections with a total number of 30 questions. The first section is demographic, consisting of 7 questions, and section-2 explains the definition and features of the Metaverse. The third section covers 23 question indicators measured by a Likert scale (1-5).

### 3.2 Sample

This study involves non-probability with convenience sampling as a method to spread the questionnaire to members of the population who are conveniently filling out the survey. This method is used when the researcher knows how many subjects (consumers, employees, light bulbs) to include in the sample and continues the process until the required sample size has been reached (Sekaran & Bougie, 2019). Some method is used to find the sample, like the 10 times rule (70 Samples), G Power analysis (85 Samples), and the Cohen table (75 Samples) to determine sample size. Thus, the sample for this research is 85 samples.

### 3.3 Data analysis technique

In the beginning, IBM SPSS was used for analyzing a pre-test for 30 people to get initial insight and eliminate potential problems. This study can continue identifying the large sample and testing the hypothesis if the study passes the validity and reliability analysis. Microsoft Office was used for analyzing the demographic using descriptive statistics. SEM-PLS, a multivariate statistical analysis technique, was used to analyze the responses to examine the model, factors, structural relationships, and hypotheses testing. It assesses complex cause-effect relationship models with latent variables. The study used a SmartPLS3 for data analysis software.

## 4. FINDINGS AND DISCUSSION

The research analysis will be analyzed with a quantitative research approach. This approach utilizes preliminary evaluation (validity and reliability), descriptive analysis, measurement evaluation model (reliability, consistency reliability, convergent validity, and discriminant validity), and structural model evaluation (collinearity, significance, and relevance of path coefficients, explained variance, predictive relevance, effect size, and model fit).

### 4.1 Descriptive Analysis

The questionnaires were distributed to 85 training participants or followers from MarkPlus Insitute. 59% of the respondents who participated in the survey were female, and 41% were male. Most of the respondents (89%) were Generation Z. Around 75% of those surveyed were university students or fresh graduates. Most of them (73%) never use Metaverse Game. The respondent primarily only heard about the Metaverse (38%) or studied about the Metaverse through Webinar (44%%). Among the respondents, 89% are willing to use Metaverse in the future (1-2 years).

### 4.1 Measurement evaluation model

According to Hair et al. (2019), indicators with reflective indicator loading above 0.7 can be used in the further analysis because they indicate that the construct explains more than 50 percent of the indicator's variance, thus providing acceptable item reliability. The second step is assessing internal consistency reliability, most often using Cronbach's Alpha and Composite Reliability are measured to validate internal consistency between the variable and indicators. The minimum score of 0.70 may represent a good construct's internal consistency reliability,

assuming the correct factor model (Hair et al., 2019). The third step is to assess the convergent validity of each construct measure. The acceptable AVE must be at least 0.50. Tabel-1 shows that all outer loading, Cronbach's alpha, Composite Reliability, and Average Variance Extracted (AVE) meet the requirements for the next stage.

**Table-1: Evaluation Criteria (Reflective outer models)**

| Construct | Outer Loading | Cronbach's Alpha | Composite Reliability | Average Variance Extracted (AVE) |
|---|---|---|---|---|
| Source of Credibility (SC) | 0.700 - 0.868 | 0.909 | 0.928 | 0.65 |
| Perceived Usefulness (PU) | 0.792 - 0.845 | 0.845 | 0.896 | 0.683 |
| Perceived Ease of Use (PeoU) | 0.811 - 0.891 | 0.872 | 0.912 | 0.721 |
| Facilitating Condition (FC) | 0.796 - 0.866 | 0.846 | 0.897 | 0.685 |
| Behavioral Intention (BI) | 0.722 - 0.929 | 0.868 | 0.912 | 0.723 |

**Source:** *PLS-SEM data process (2022)*

The fourth step is to assess discriminant validity, which is the extent to which a construct is empirically distinct from other constructs in the structural model. Henseler et al. (2015) proposed a threshold value of 0.90. The discriminant validity criterion for the constructs has been satisfied because, as shown in Table-2, all HTMT values are less than 0.9, proving that the HTMT criterion was developed.

**Table-2:** HTMT criteria evaluation

| | BI | FC | PEOU | PU | SC |
|---|---|---|---|---|---|
| **BI** | | | | | |
| **FC** | 0.778 | | | | |
| **PEOU** | 0.870 | 0.660 | | | |
| **PU** | 0.647 | 0.486 | 0.871 | | |
| **SC** | 0.595 | 0.687 | 0.637 | 0.513 | |

**Source:** *PLS-SEM data process (2022)*

### 4.2 Structural Model Evaluation

Before assessing the structural correlations, collinearity must be evaluated to ensure it does not distort the regression results. VIF values above 5 suggest possible collinearity difficulties among the predictor constructs (Hair et al., 2019). Table-3 reported that the VIF numbers meet the criteria.

**Table-3: Structural model – Collinearity (VIF)**

| | Behavioral Intention (BI) | Perceived Ease of Use (PeoU) | Perceived Usefulness (PU) |
|---|---|---|---|
| Behavioral Intention (BI) | | | |
| Facilitating Condition (FC) | 1.541 | | |
| Perceived Ease of Use (PeoU) | 4.033 | | 1.461 |
| Perceived Usefulness (PU) | 3.129 | | |
| Source of Credibility (SC) | | 1.000 | 1.461 |

**Source:** *PLS-SEM data process (2022)*

Research hypotheses will be tested by calculating P-value; the result should be under 0.05 in the 95% Confident level. The path coefficient shows the correlation between two variables, ranging from -1.00 to 1.00. A correlation value of 0 indicates no link, a correlation value of 1.0

indicates a perfect positive correlation, and a correlation value of -1 indicates a perfect negative correlation. The path coefficient can be classified as weak (0.00-0.29), low (0.30-0.49), moderate (0.50-0.69), strong (0.70-0.89), and very strong (0.90-1.00) (Hinkle et al., 1998; Luckey & Pett, 1998; Pett et al., 2003). Analysis of the 95% interval confidence interprets higher (lower) exogenous variable will increase(decrease) endogenous variable between the statistical value of 2.5% to 97.5%. F2 values will analyze a predictor variable's relative effect on an independent variable. As a rule of thumb, values higher than 0.02, 0.15, and 0.35 depict small, medium, and large f2 effect sizes (Cohen, 1988) for direct and moderation effects. On the other hand, Ogbeibu et al., (2021) propose a halving adjustment to Cohen's recommendations such that the squared standardized v effect should be greater than 0.175 for a large effect, 0.075 for a medium and 0.01 for a small, making them more appropriate for indirect effects.

Table 4 demonstrates that five hypotheses (H1, H4, H7, H8, H9) are rejected or over 0.05. That means the predictor variables do not directly affect with endogenous variable. Although H1 and H9 are rejected, SC indirectly affects PU and BI through mediating effect from PEoU (Indirect-only). Unfortunately, SC doesn't indirectly affect BI through PU or PEoU and PU. Facilitating Condition (FC) has experimented as a moderator. However, the P-value of the table proved that all the relationship does not have a moderating effect. In the rest, four hypotheses (H2, H3, H5, and H6) were accepted or under 0.05. That means SC directly affects PEoU, PEoU on PU, PEoU on BI, and FC on BI.

**Table-4: Result of hypothesis testing**

| **Hypothesis** | P-Value | Sig/ Mediating | Path Coefficient | 95% Interval Confident Path Coefficient | | F2/ Upsilon (V) |
|---|---|---|---|---|---|---|
| | | | | 2.50% | 97.50% | |
| **Direct Effect** | | | | | | |
| H1: (SC) -> (PU) | 0.603 | **Rejected** | 0.06 | -0.148 | 0.311 | 0.006 |
| H2: (SC) -> (PEoU) | 0 | **Accepted** | 0.562 | 0.38 | 0.715 | 0.461 |
| H3: (PEoU) -> (PU) | 0 | **Accepted** | 0.729 | 0.518 | 0.909 | 0.873 |
| H4: (PU) -> (BI) | 0.784 | **Rejected** | 0.035 | -0.223 | 0.283 | 0.001 |
| H5: (PEoU) -> (BI) | 0.001 | **Accepted** | 0.471 | 0.174 | 0.76 | 0.161 |
| H6: (FC) -> (BI) | 0 | **Accepted** | 0.371 | 0.208 | 0.558 | 0.262 |
| H9: (SC) -> (BI) | 0.686 | **Rejected** | 0.057 | -0.153 | 0.297 | 0.002 |
| **Moderating - Facilitating Condition (FC)** | | | | | | |
| H7: (PU) -> (BI) | 0.462 | **Rejected** | 0.119 | -0.349 | 0.289 | 0.014 |
| H8: (PeoU) -> (BI) | 0.674 | **Rejected** | -0.07 | -0.192 | 0.456 | 0.012 |
| **Mediating Effects** | | | | | | |
| (SC) -> (PU) -> (BI) | 0.919 | No Effect | 0.002 | -0.029 | 0.043 | 0.000 |
| (SC) -> (PEoU) -> (BI) | 0.011 | Full Mediating | 0.259 | 0.071 | 0.474 | 0.067 |
| (SC) -> (PEoU) -> (PU)) | 0.000 | Full Mediating | 0.411 | 0.271 | 0.570 | 0.169 |
| (SC) -> (PEoU) -> (PU)) -> (BI) | 0.823 | No Effect | 0.012 | -0.106 | 0.122 | 0.010 |

**Source:** *PLS-SEM data process (2022)*

The next step is to look at the endogenous construct's $R^2$ value (s). The explanatory model strength is indicated by the $R^2$, which measures the variance explained in each of the

endogenous constructs (Shmueli & Koppius, 2011). As a guideline, the R2 values of 0.75, 0.50, and 0.25 can be considered substantial, moderate, and weak (Hair et al., 2011; Henseler et al., 2009). Q2 measures a model's ability to predict the relevance of the endogenous constructs, it looks at how well a model predicts data that isn't utilized to calculate model parameters. This feature makes Q2 a measure of out-of-sample predictive power (i.e., predictive relevance) (Joseph F Hair, Jr., G. Tomas M. Hult, Christian M. Ringle, 2017). Table-5 reported that R Square has a moderate effect on Behavioral intention. It means 65.8% is influenced by exogenous variables (PeoU, PU, FC, and SC), and other external factors influence 34.2%. The model has predictive relevance because of the statistical result of Q2 > 0.

**Table-5: Result of R Square and Q Square testing**

| | R Square | Interpretation | Q Square | Interpretation |
|---|---|---|---|---|
| Behavioral Intention (BI) | 0.658 | Moderate | 0.439 | relevance |
| Perceived Ease of Use (PeoU) | 0.316 | Substantial | 0.200 | relevance |
| Perceived Usefulness (PU) | 0.584 | Moderate | 0.395 | relevance |

**Source:** *PLS-SEM data process (2022)*

The last step is checking the model fit, or the standardized root means square residual (SRMR). Translating the sample covariance matrix and the projected covariance matrix into correlation matrices measures the mean absolute value of the covariance residuals. As a rule of thumb, A value less than 0.10 or 0.08 are considered a good fit (Schermelleh-Engel et al., 2003). Sarstedt et al., (2014) introduce the SRMR as a goodness-of-fit measure for PLS-SEM that can be used to avoid model misspecification. Table-6 mentions the estimated model (0.094) under 0.10, indicating a good fit.

**Table-6: Result of Model Fit testing**

| | Saturated Model | Estimated Model <0.10 |
|---|---|---|
| SRMR | 0.079 | 0.094 (fit) |

**Source:** *PLS-SEM data process (2022)*

## CONCLUSION AND RECOMMENDATIONS

Utilizing the TAM model to research behavior intention using Metaverse as a learning platform at MarkPlus Institute, a research model has been proposed and assessed in this study. The investigation revealed that the suggested research model is reliable and internally consistent. The structural model used in this investigation found a moderate prediction with R Square (65.8%) and an adequate model fit. Although, some hypotheses were rejected because of the possibility of limited information about the Metaverse's benefits and features or the most respondents could not imagine learning in the future. For the majority of the predictors, significant mediating effects were discovered. However, the moderator's function in this study model was deemed unnecessary.

This study provides several managerial guidelines for the education industry that want to use Metaverse as a learning platform. The first insight is that PEoU significantly impacts BI. The company should create a campaign focusing on user convenience and develop a simple video tutorial to enter the Metaverse to increase perceived ease of Use. The Second insight is PEoU has a mediating effect Between the SC and BI. The company cannot stand alone promoting Trustworthiness, expertness, and Reputation to increase behavioral intention. The company should create awareness that using Metaverse is easy for them and then give the customer testimonial, case study/best practice from the existing student, and show certification or award from other companies that focus on simplicity or practicality. The third insight, FC directly

impacts BI. The company should create guidance to use the Metaverse system and collaborate with a technology company to create affordable devices. Finally, the results of this study will help the education industry market Metaverse as a learning platform.

## REFERENCES


Akour, I. A., Al-Maroof, R. S., Alfaisal, R., & Salloum, S. A. (2022). A conceptual framework for determining metaverse adoption in higher institutions of gulf area: An empirical study using hybrid SEM-ANN approach. *Computers and Education: Artificial Intelligence*, *3*, 100052. https://doi.org/10.1016/j.caeai.2022.100052

Al-Emran, M., Mezhuyev, V., & Kamaludin, A. (2018). Technology Acceptance Model in M-learning context: A systematic review. *Computers and Education*, *125*. https://doi.org/10.1016/j.compedu.2018.06.008

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6). https://doi.org/10.1037//0022-3514.51.6.1173

Canorea, E. (2021). *What companies use metaverses for and why the big tech companies are so interested - Plain Concepts*. Plainconcepts.Com. https://www.plainconcepts.com/metaverse-companies/

Chauhan, S. (2015). Acceptance of mobile money by poor citizens of India: Integrating trust into the technology acceptance model. *Info*, *17*(3). https://doi.org/10.1108/info-02-2015-0018

Ching-Ter, C., Hajiyev, J., & Su, C. R. (2017). Examining the students' behavioral intention to use e-learning in Azerbaijan? The General Extended Technology Acceptance Model for E-learning approach. *Computers and Education*, *111*. https://doi.org/10.1016/j.compedu.2017.04.010

Dang, Q. (2022). Research on the Impact of Media Credibility on Risk Perception of COVID-19 and the Sustainable Travel Intention of Chinese Residents Based on an Extended TPB Model in the Post-Pandemic Context. *Sustainability*, *14*(14), 8729. https://doi.org/10.3390/su14148729

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3). https://doi.org/10.2307/249008

Díaz, J. E. M., Saldaña, C. A. D., & Avila, C. A. R. (2020). Virtual world as a resource for hybrid education. *International Journal of Emerging Technologies in Learning*, *15*(15). https://doi.org/10.3991/ijet.v15i15.13025

Engelbrecht, E. (2005). Adapting to changing expectations: Post-graduate students' experience of an e-learning tax program. *Computers and Education*, *45*(2). https://doi.org/10.1016/j.compedu.2004.08.001

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139–152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. In *European Business Review* (Vol. 31, Issue 1). https://doi.org/10.1108/EBR-11-2018-0203

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1). https://doi.org/10.1007/s11747-014-0403-8

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, *20*. https://doi.org/10.1108/S1474-7979(2009)0000020014

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (1998). *Applied Statistics for the behavioral sciences. 4th Ed*. Houghton Mifflin.

Humida, T., al Mamun, M. H., & Keikhosrokiani, P. (2021). Predicting behavioral intention to use e-learning system: A case-study in Begum Rokeya University, Rangpur, Bangladesh. In *Education and Information Technologies*. https://doi.org/10.1007/s10639-021-10707-9

Joo, Y. J., So, H. J., & Kim, N. H. (2018). Examination of relationships among students' self-determination, technology acceptance, satisfaction, and continuance intention to use K-MOOCs. *Computers and Education*, *122*. https://doi.org/10.1016/j.compedu.2018.01.003

Joseph F Hair, Jr., G. Tomas M. Hult, Christian M. Ringle, M. S. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM); Second Edition. In *Paper Knowledge . Toward a Media History of Documents* (Vol. 7, Issue 2).

Ju Hyun, J. (2021). A Study on Education Utilizing Metaverse for Effective Communication in a Convergence Subject. *International Journal of Internet, Broadcasting and Communication*, *13*(4), 129–134. http://dx.doi.org/10.7236/IJIBC.2021.13.4.129

Kamal, S. A., Shafiq, M., & Kakria, P. (2020). Investigating acceptance of telemedicine services through an extended technology acceptance model (TAM). *Technology in Society*, *60*. https://doi.org/10.1016/j.techsoc.2019.101212

Kang, J. W., & Namkung, Y. (2019). The information quality and source credibility matter in customers' evaluation toward food O2O commerce. *International Journal of Hospitality Management*, *78*. https://doi.org/10.1016/j.ijhm.2018.10.011

Little, D., & Green, D. A. (2021). Credibility in educational development: trustworthiness, expertise, and identification. *Higher Education Research and Development*, *0*(0), 1–16. https://doi.org/10.1080/07294360.2020.1871325

Luan, W. S., & Teo, T. (2011). Student Teachers' Acceptance of Computer Technology. In *Technology Acceptance in Education*. https://doi.org/10.1007/978-94-6091-487-4_3

Luckey, D. W., & Pett, M. A. (1998). Nonparametric Statistics for Health Care Research: Statistics for Small Samples and Unusual Distributions. *Journal of the American Statistical Association*, *93*(441). https://doi.org/10.2307/2669654

Mehta, A., Morris, N. P., Swinnerton, B., & Homer, M. (2019). The Influence of Values on E-learning Adoption. *Computers and Education*, *141*. https://doi.org/10.1016/j.compedu.2019.103617

Ogbeibu, S., Jabbour, C. J. C., Gaskin, J., Senadjki, A., & Hughes, M. (2021). Leveraging STARA competencies and green creativity to boost green organisational innovative evidence: A praxis for sustainable development. *Business Strategy and the Environment*, *30*(5). https://doi.org/10.1002/bse.2754

Park, S., Ji Kang, Y., & Author, C. (2021). A Study on the intentions of early users of metaverse platforms using the Technology Acceptance Model. *Journal of Digital Convergence*, *19*(10), 275–285. https://doi.org/10.14400/JDC.2021.19.10.275

Pett, M. A., Lackey, N. R., & Sullivan, J. J. (2003). *Making Sense of Factor Analysis: the use of factor analysis for instrument development in health care research*. Sage Publications.

Sarstedt, M., Ringle, C. M., Henseler, J., & Hair, J. F. (2014). On the Emancipation of PLS-SEM: A Commentary on Rigdon (2012). *Long Range Planning*, *47*(3). https://doi.org/10.1016/j.lrp.2014.02.007

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *MPR-Online*, *8*.

Sekaran, U., & Bougie, R. (2019). *Research Methods For Business: A Skill Building Approach*. Wiley.

Selim, H. M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education*, *49*(2), 396–413. https://doi.org/10.1016/j.compedu.2005.09.004

Sharif, A., Awan, T. M., & Paracha, O. S. (2022). The fake news effect: what does it mean for consumer behavioral intentions towards brands? *Journal of Information, Communication and Ethics in Society*, *20*(2). https://doi.org/10.1108/JICES-05-2021-0044

Shmueli, G., & Koppius, O. R. (2011). Predictive analytics in information systems research. In *MIS Quarterly: Management Information Systems* (Vol. 35, Issue 3). https://doi.org/10.2307/23042796

Tlili, A., Huang, R., Shehata, B., Liu, D., Zhao, J., Metwally, A. H. S., Wang, H., Denden, M., Bozkurt, A., Lee, L. H., Beyoglu, D., Altinay, F., Sharma, R. C., Altinay, Z., Li, Z., Liu, J., Ahmad, F., Hu, Y., Salha, S., … Burgos, D. (2022). Is Metaverse in education a blessing or a curse: a combined content and bibliometric analysis. In *Smart Learning Environments* (Vol. 9, Issue 1). Springer. https://doi.org/10.1186/s40561-022-00205-x

Usman, H., Mulia, D., Chairy, C., & Widowati, N. (2022). Integrating trust, religiosity and image into technology acceptance model: the case of the Islamic philanthropy in Indonesia. *Journal of Islamic Marketing*, *13*(2). https://doi.org/10.1108/JIMA-01-2020-0020

Yi, Y., Tung, L. L., & Wu, Z. (2003). Incorporating Technology Readiness ( TR ) Into TAM : Are Individual Traits Important to Understand Technology Acceptance ? *DIGIT Proceedings*, *2*.