

OBE

by Hendra Bunyamin

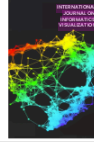
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Exploring Technology Integration in Education: Lecturers Perspective on Outcomes-Based Education Platforms

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Abstract—Informatics education is evolving rapidly through the adoption of Outcome-Based Education (OBE), necessitating a rigorous investigation into the effectiveness of the implementation. This study was conducted using the advanced Unified Theory of Acceptance and Use of Technology (UTAUT)-3 model to assess the potential of OBE systems in enhancing teaching and learning processes. The study integrated a comprehensive set of nine variables to measure the acceptance level of OBE systems among lecturers at Maranatha Christian University Bandung and Universitas Muhammadiyah Malang. UTAUT-3 provides a more explicit understanding by incorporating Hedonic Motivation (H.M.), Habit (H), and Personal Innovativeness (P.I.). The Model also integrated the core constructs of Performance Expectancy (P.E.), Effort Expectancy (E.E.), Social Influence (S.I.), Facilitating Conditions (F.C.), Behavioral Intention (B.I.), and Users Behavior (U.B.). The result showed that B.I. was a central determinant of U.B., suggesting users' preparedness to engage with OBE systems. Furthermore, the routine use of technology as Habit (H) was closely related to Behavioral Intention (B.I.), showing that familiarity with technology facilitated the intention to adopt OBE systems. The result showed that UTAUT-3's comprehensive framework was superior in evaluating educational technology adoption due to its ability to account for users' engagement as Hedonic Motivation (H.M.), dispositional tendencies toward Personal Innovativeness (P.I.), and the critical role of established habits. Consumers' actual experiences and technological proficiency significantly influence adoption rather than individual characteristics. Therefore, UTAUT-3 was a more effective tool for predicting and understanding the Acceptance of OBE systems, guiding educational institutions toward successfully integrating information systems in learning environments.

Keywords—outcome-based, education, Acceptance, use of technology.

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I. INTRODUCTION

Outcome-based Education (OBE) OBE, or performance-based education, is a learner-centered, future-focused "Empowerment Paradigm" that encourages and equips every student for success in the future [1].

This tool was created at Maranatha Christian University Bandung and Muhammadiyah University Malang based on the global use of technology in every teaching system and the outcome of education implementation in the curriculum [2]. Teachers should also consider students' abilities so that material regarded as complex can be given on time. The material must be repeated and, if necessary, corrected to achieve maximum results.

The respondents of this research are OBE system users, namely lecturers. The modeling used is UTAUT-3 with the Structural Equation Model and Amos 28 for data processing.

UTAUT is a model that predicts the Acceptance of information technology [3].

UTAUT is an extension of UTAUT that adds three variables: hedonic motivation, price value, and habit. Farooq et al. [2] introduced the UTAUT3 framework extending the UTAUT2 structure. In addition to a new independent variable called Personal Innovativeness (P.I.), the UTAUT-3 considers eight drivers of technology acceptance: Performance Expectancy (P.E.), Effort Expectancy (E.E.), Social Influence (S.I.), Facilitating Conditions (F.C.), Habit (H), Hedonic Motivation (H.M.), and Price Value (P.V.). In the nine empirical UTAUT-2 studies, the Price Value (P.V.) variable was employed in only 32 studies (41%), while 47 other studies (59%) used the P.V. from their study model [4]. The impact of technology on people—such as OBE applications—is highlighted in the study. The Price Value (P.V.) needed to construct the UTAUT-3 model was not derived.

Several studies that used UTAUT-3 in connection with the problem of teacher adoption at universities in Sri Lanka showed that the variables Social Influence (S.I.) and Personal Innovativeness (P.I.) in information technology were not significant predictors of e-learning adoption [3]. Gunasinghe showed that UTAUT is one of the models that most modified the original framework to explain the meaning of Academic Technology Acceptance also his past Studies showed that habit has a significant effect on both user intention and actual use of technology [5].

The UTAUT-3 acceptance model was used at the University of Sri Lanka. The results showed that the variables Facilitating Condition (F.C.), Habit (H), and Hedonic Motivation (H.M.) significantly affected Behavior Intention (B.I.), while social influence and personal Innovativeness were not determining variables in the Acceptance of virtual learning [3]. Academics should encourage each other to use the new OBE system. In this case, it is hoped that S.I.'s influence as one of the variables determining U.B. could occur in Maranatha Christian University.

Using UTAUT3 to understand actual use of ICT by teachers in Philipina shows that Performance expectancy (P.E.), effort expectancy (E.E.), and social influence (S.I.) significantly affect teachers' behavioral intention to use ICTs (B.I.). Teachers' ICT use habit (H) and facilitating conditions (F.C.) all positively affect teachers' actual use (U.B.) of ICTs [6].

Learning systems have been implemented at all levels of education, from elementary school to University, during the COVID-19 pandemic in 2020. Fields that use newly developed Information Systems are under examination. LLDIKI studied the BKD system using the UTAUT institutional-level model [7]. The results showed that all UTAUT variables influence B.I. among users, particularly lecturers.

II. MATERIALS AND METHOD

The explanation of the nine UTAUT3 construct variables used in this research is as follows:

Performance Expectancy (P.E.) assumes that targeted technology will help users perform better. In this study, the level of benefits from using the OBE system is carried out on how to use the system. P.E. Construct has three manifestations: the first is the usefulness of applying OBE to teaching, while the second is the increase in work speed by the system. The third is the use of OBE to increase lecturer productivity. Effort Expectancy (E.E.) users who only need a little effort to use technology will feel relief. Various previous studies have proven that effort expectancy is one factor that influences behavioral intention [8]. Furthermore, E.E. is the level of effort used in the OBE system, and it has three manifest variables: complexity, ease of use, and understanding effort.

Social Influence (S.I.) is a significant factor in determining customers' intentions to accept new technology and adopt new social standards, among other actions [9]. Social Influence (S.I.) has three variables: social factors, subjective norms, and co-workers' influence on using the B.E. system. Facilitating Condition (F.C.) is the term used to describe the user's perception that infrastructure and institutional support the specific technology [10]. Facilitation conditions are a variable

of management involvement, and the availability of technical assistance significantly influences the intention to adopt learning systems [11]. In the past study, Facilitating conditions also directly affected usage behavior. The manifest variable concerns the compatibility of the OBE system with the technological equipment used. Furthermore, the University provides knowledge and tools for lecturers to use the OBE system.

Hedonic Motivation (H.M.) is the willingness to initiate behaviors that enhance positive experiences (pleasant or excellent) and behaviors that decrease negative experiences [12]. In this research, lecturers use the OBE system voluntarily and without burden. It focuses on the automatic and unconscious components of habitual interactions with the platform, investigating how habit affects users' like behavior on WeChat. Habit (H) [13], it can be said that habit is an act an individual has automatically done based on their experiment. In this case, a lecturer will use the OBE system automatically. Habit influences the usage of information systems. More substantial habit holders are less likely to be open to using new systems [14]. Personal Innovativeness (P.I.) is a consistent personality feature encouraging people to experiment with new technologies was identified by Farooq et al. [2] and was found to influence the adoption of the still-new OBE system.

Behavioral Intention (B.I.) refers to the behavioral readiness to accept, use, or adopt a technology habit that influences the usage of information systems. [15]. The first dimension is the level of the user's intention to continue using the OBE system. The second is continuation, which is defined as the extent to which users plan to use the OBE system. User Behavior (U.B.): B is Acceptance of the OBE system, as evidenced by the frequency of users' engagement with technology and the degree to which OBE enhances knowledge and skills. In a study by Gunasinghe [5], UTAUT was one of the most developed models, and it expanded the original framework into UTAUT-2 and UTAUT-3 to explain the meaning of academic technology acceptance.

Several studies have been conducted on the use of education and systems. Based on the result, it was concluded that the UTAUT variable positively influenced the desire to use the existing system. However, there are slight differences in studies at a university in Sri Lanka, showing that S.I. does not occur when using the new system [5]. The distinct characteristics of each respondent group demonstrated the importance of conducting this study at the two Indonesian private universities to become a foundation for a more in-depth investigation.

The main method is quantitative, with primary data collected through conducting surveys to target participants using a questionnaire delivered via Google Forms and distributed electronically using WhatsApp, Instagram Direct Message, or Telegram apps. This method enhances the efficiency of data collection, thereby improving the quality and practicality of disseminating study results.

Data was processed to test the Model through the IBM Application SPSS AMOS 26, which used the Structural Equation Model statistical analysis tool, combining factor analysis and regression [16]. In this study, the significance level P was a determined value = $\alpha \leq 0.10$.

The Analysis interprets the results using the IBM SPSS Statistics tool. In the initial stage, each construct was based on the results obtained through distributed questionnaires. After each construct was analyzed with Amos 26, manifest variables were trimmed, and two variables were removed, as shown in Table 1.

TABLE I
TRIMMING CONSTRUCTS AGAINST MANIFESTS

Variable Construct	Variable Manifest	Stated	Interpretation
FC	X11	University assistance to facilitate OBE	University assistance providing facilities for OBE development is considered not to reflect the facilities' condition.
PI	X20	Carefree use of OBE	Use of OBE without manifest Variable Personal Innovativeness

In the figure 1. We can see the Model of exploring technology Integration In Education. The UTAUT (Fig. 1) shows that behavioural intentions are directly correlated with performance expectancy, effort expectancy, facilitating condition, hedonic motivation, personal Innovativeness, and social influences, whereas actual usage is correlated with the end User Behaviour

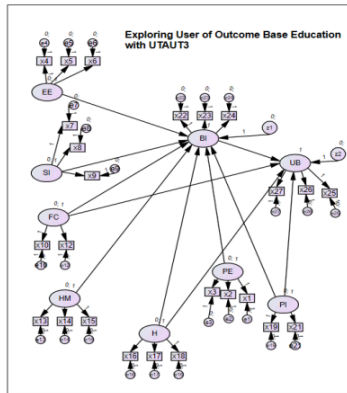


Fig. 1 The Model Exploring user of OBE with UTAUT-3

The relationship between BI and U was eliminated because the result of the P value is 0.9 , significantly higher than the P value $= \alpha < 0.10$. Therefore, the Model of UTAUT3 in the OBE framework was developed using AMOS [16], as shown in Fig. 1. The studies of academicians regarding the use of new technology platforms vary and find many variables. In the following table are comparative studies about the Acceptance of Technology platform by academicians.

TABLE II
THE COMPARATIVE MODEL AND FINDING OF ACADEMICIAN'S TECHNOLOGY ADOPTION

Author	Subject	Model/Data Analysis	Finding
Granić, A., Marangunić, [17]	Review 375 Publication in Croatia	Technology acceptance model in educational context: a systematic literature review/SEM	PU is the most substantial variable. SEM the most Used Analysis PE and P.U. are the variables that affect tech Acceptance.
Nandwani and Khan [18]	Pakistan HEI instructor's intention to use e-Learning	Extended UTAUT with Self efficacy (S.E.), Anxiety (C.A.) and Attitude (ATT)/PLS-SEM	PE-BI EE-BI CA → B.I. S.E. → BI SI → BI
Shaheen [1]	Engineering degree awarding institutes in Pakistan.	the philosophical and theoretical and Current Challenges of OBE Framework	explains the challenges in the implementation of OBE. In engineering, education can be achieved.
Šumak and Šorgo [19]	Use of interactive white boards by Slovenia's Teacher	Extended UTAUT with Attitude (ATT)/SEM	PE → ATT EE → BI PE → BI SI → BI FC → UB EE-BI BI-U.B. PE-BI EE → BI FC → BI SI-BI BI → UB PU → BI, PEOU → BI
Bervell and Umar [20]	Ghana's Tutor's Acceptance of LMS	UTAUT PLS/SEM	PE-BI EE → BI FC → BI SI-BI BI → UB PU → BI, PEOU → BI
Abu-Shanab and Abab Neh [21]	Academicians' Acceptance of eLearning in the university environment	Extended TAM Age Job satisfaction /Multiple Regression	AGE, J.S.
Machimbidza and Mutula [22]	Zimbabwe Academics Acceptance of peer-reviewed e-journals	University lecturers Infrastructure and Facilities (F.C.) Computer skills (C.S.)/ Multiple regression	F.C. → BI CS → B.I.

III. RESULTS AND DISCUSSION

In this study, 35.2% of the respondents came from Universitas Muhammadiyah Malang (35.2%), while 64.8% are students at Maranatha Christian University, focusing on the Faculty of Information Technology and Engineering.

A. Profiling Respondents

Respondents' profiles were obtained based on the average results of 9 variables, as shown in Table 3.

TABLE III
PROFILING RESPONDENT

Variable Manifest	Variable Construct									
	P.E.	E.E.	S.I.	F.C.	H.M.	H.	P.I.	B.I.	U.B.	
	X1=4	X4=3	X7=4	X10=4	X13=4	X16=4	X19=5	X22=4	X25=4	
	X2=4	X5=4	X8=4	X11=4	X14=5	X17=4	X20=4	X23=4	X26=4	
	X3=4	X6=4	X9=4	X12=4	X15=4	X18=4	X21=3	X24=4	X27=4	
Average	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	

The highest results were obtained for the HM-x14 Construction Variable, particularly the appropriateness for hedonic motivation. Respondents expressed strong agreement regarding the appropriateness of OBE for implementation. The second highest construct variable was P.I., with the lowest result for global E.E. This low value suggests that the expectancy of using OBE free of trouble is still uncertain.

B. OBE Model Accuracy Testing with UTAUT3

The Model Fit of the model index taken in this research is the minimum simple discrepancy function. (CMIN/DF), Comparative Fit Index (CFI), RMSEA (Root Mean Square Error of Approximation), NFI (Normed Fit Index), and TLI (The following results of model accuracy testing; [23] Limit If CMIN/df value If a model is ≤ 2.0 or ≤ 0.5 , then the value can be said to be no acceptable fit; the result obtained is 2.799. The CFI limit is between 0 (not fit) and 1 (very fit); the CFI result 0.565 indicates that the Model is within the limit. Good FIT Standard value $0.05 < RMSEA < 0.08$, RMSEA result 0.184, so the Model is not in the Good Fit limit; it has a limit of $0 < NFI < 1$; Fit, in this situation, the NFI result of 0.466 indicates that the Model is within the marginal FIT limit. The TLI has a limit between 0.90 and 0.95, which is considered marginal fit; above 0.95, the good fit result is 0.518, so the Model is not yet within the marginal fit limit.

C. Testing the Full Structure Model of Emotional Regulation Online Class

Complete structural model testing determines the relationship between variables from UTAUT 3. Table 4 below shows calculation results using Amos 28 for the Emotional Regulation Model for students attending online.

TABLE IV
THE STRUCTURAL MODEL

Hypothesis	Estimate	S.E.	C.R.	P value	Result
B.I. ← P.E.	.150	.063	2.371	.018	Supported
B.I. ← E.E.	-.018	.037	-4.78	.633	Not Supported
B.I. ← S.I.	-.032	.041	-7.83	.434	Not Supported
B.I. ← F.C.	.090	.053	1.710	.087	Supported
B.I. ← H.M.	.092	.072	1.270	.204	Not Supported
B.I. ← P.I.	.050	.026	1.882	.060	Supported
B.I. ← H	.544	.103	5.278	***	Supported
U.B. ← B.I.	1.938	.747	2.593	.010	Supported
U.B. ← P.I.	-.077	.069	-1.111	.267	Not Supported
U.B. ← H	-.702	.511	-1.373	.170	Not Supported
U.B. ← F.C.	-.102	.123	-.831	.406	Not Supported

In this case, when the p-value equals or exceeds 0.10 concerning alpha, the null hypothesis (Ho) is rejected, and the alternative hypothesis (H1) is accepted. Based on the final Model of OBE with UTAUT3, there are five factors related to B.I.'s use of the OBE system. Lecturer performance, which increases with the use of the OBE system (P.E. ← B.I.), influences the intention to use the OBE system. This result is

consistent with the report of previous studies showing the influence of P.E. on behavior intention [24], [25], [26].

The facilities satisfy the criteria and support users in implementing the OBE system. Furthermore, F.C. was found to impact usage intention and OBE of the behavior system significantly. This result is also consistent with the report of [4] on adopting e-learning systems in Qatar and the USA. Teachers who have a personal desire to innovate in the Information and Technology field tend to accept the OBE system without burden [25].

The lecturer's habit of mastering the system correlates with fostering the desire to practice OBE, as the final results of the relationship showed the validity of B.I. in predicting U.B., fast supported by Shen and Sharif [27]. Once the user realizes the desire to use the system, it will become a daily behavior. Figure 2 shows the final OBE model with UTAUT 3 and the structural results.

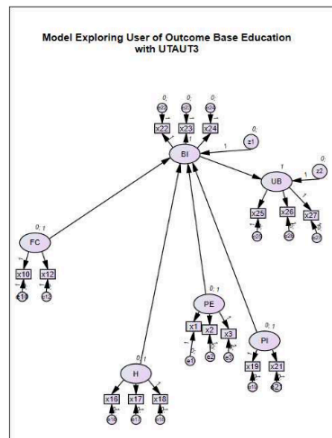


Fig. 2 The Final Model Exploring user of OBE with UTAUT-3

TABLE V

Hypothesis	Estimate	S.E.	C.R.	P value	Result
B.I. ← PE	.150	.063	2.371	.018	Supported
B.I. ← F.C.	.090	.053	1.710	.087	Supported
B.I. ← P.I.	.050	.026	1.882	.060	Supported
B.I. ← H	.544	.103	5.278	***	Supported
U.B. ← B.I.	1.938	.747	2.593	.010	Supported

The magnitude of the influence between the Final Model Variables Exploring User of OBE and UTAUT3. The total effect size of the final Exploring User of OBE model with UTAUT3.

TABLE VI
THE TOTAL EFFECT BETWEEN CONSTRUCT VARIABLES

P.I.	FC	PE	H	B.I.	U.B.
B.I.	.060	.098	.226	.492	.000
U.B.	.061	.100	.231	.502	1.020

The most significant influence was on the U.B. → B.I. relationship, showing that the readiness to use the OBE system directly correlates with U.B. The second most significant influence on an individual's habit of using technology facilitated the desire for an OBE system [17].

The hope for better performance with the OBE system influences the desire to use the OBE system and makes it a behavior. The study found that OBE system adoption was heavily influenced by the user's views, experience, and skills rather than their personality or the opinions of others. However, current research parameters, including S.I., E.E., and H.M., were found to be relevant in predicting technology adoption, while the UTAUT-3 presented by Farooq et al. needed to be validated. As a result, the study adds information regarding academicians' Acceptance of the OBE system. Hopefully, these results will help the Education Development Institute and OBE administration create and execute their strategies to adapt smoothly to the following technology system.

This study's limitation is that it does not include the students as applied people to be explored. The previous study using the UTAUT model to analyze students' ICT adoption at Methodist University College, Ghana, showed that Among the proposed hypotheses, behavioral intentions to utilize ICT for learning are influenced by effort expectancy, performance expectancy, and social influence [28]. There is an issue for the platform education creator. To make users happy while learning, app designers should consider the joy of learning while creating resources for m-learning apps [14]. The enjoyment related to the user-system interaction will be reflected as the experience grows.

Also, the University's decision to make an OBE platform needs to enhance this procedure since monitoring and Analysis work can determine whether a project succeeds or fails [29]. The curriculum needs to be improved occasionally. Because it aligns with the Ministry of Education, it aims to enhance the quality of education and students' academic achievements [30]. This point of view is consistent with UNESCO's (2018) proposals for a regional strategy, which state that the Asia-Pacific area should work to enhance basic education systems [31]. Also, the University needs to pay attention to the users' expectations. If the system meets the user requirements, the platform is used regularly. In contrast, once the system fails, then they will not trust it again and regret to use [32].

IV. CONCLUSIONS

In conclusion, this study used only lecturers' opinions due to limited time and scope. Future studies need to consider the perceptions of academicians, OBE students, and administrators. The study should limit the scope to specific

time intervals and mixed data collection with broader respondents, and it should also include academicians, students, and administrators as a more comprehensive source. Based on UTAUT-3, this study investigated the use of the OBE system from a lecture perspective. Analysis of the structural Model showed that 5 of the 11 Hypothesized Relationships were Significant in Predicting OBE system Adoption.

Several variables, P.E., FC., P.I., and H, substantially impacted the intention to utilize the OBE system, according to the final OBE model with UTAUT3. Also, usage behavior is correlated with behavior intention, as evidenced by the most significant association discovered between U.B. and B.I. The study revealed that user perspectives, experience, and abilities significantly impacted adopting OBE systems more than personality traits or other people's opinions. Due to the success of the OBE system, recommendations were given for educational institutions to track and evaluate the system's implementation and then make a development system that is simple and easy to use.

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