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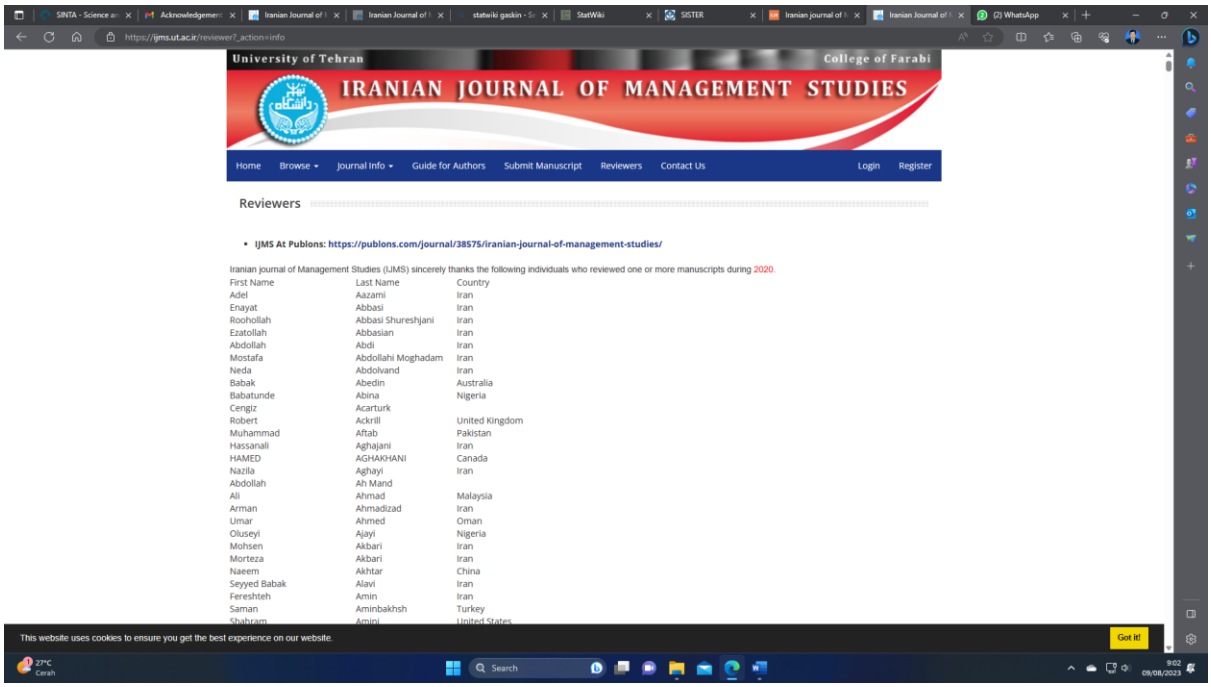

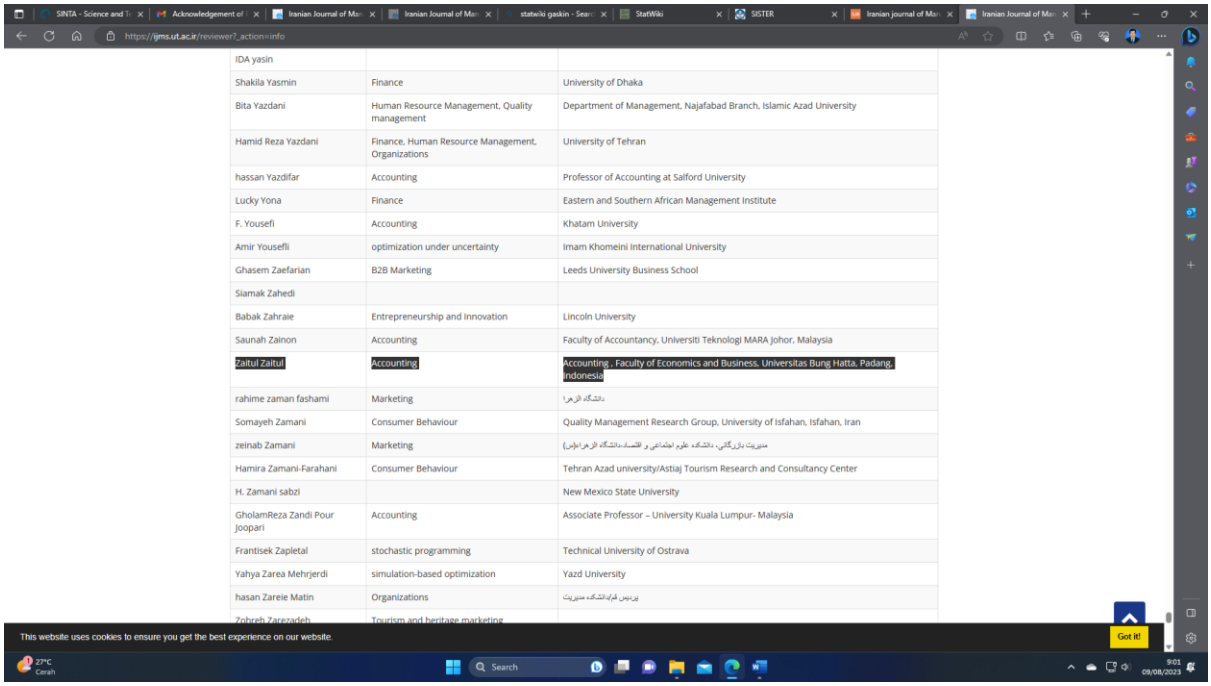

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List of Reviewed Manuscripts:

#	Manuscript ID	Manuscript Title	Review Date
1	IJMS-202307-675992 (R3)	EXAMINER PERFORMANCE INFLUENCED BY CORE SELF-EVALUATION: EXAMINING THE MODERATING ROLE OF INFORMATION TECHNOLOGY	2023-12-05

Kayhan Tajeddini
Editor-in-Chief of Interdisciplinary Journal of Management Studies (Formerly known as Iranian Journal of Management Studies)

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EXAMINER PERFORMANCE INFLUENCED BY CORE SELF-EVALUATION: EXAMINING THE MODERATING ROLE OF INFORMATION TECHNOLOGY

Abstract

This study aims to understand the role of core self-evaluation on examiner performance, as well as provide an illustration of how information technology moderates the effect of core self-evaluation on examiner performance. This study seeks to fill the lack of empirical evidence about the role of personality models; personality models are needed to improve individual performance. The conceptual framework model is developed using attribution theory and the *Technology Acceptance Model (TAM)* model as the grand theory. Two hundred sixty-five questionnaires are distributed to tax examiners in five provinces on the island of Sulawesi; the data are disseminated using Google Forms. In the hypothesis analysis, the researcher uses SEM-Amos to describe the effect of the independent variables on the dependent variable. The results of this study indicate that *locus of control, emotional stability, self-esteem,* and *self-efficacy* influence the examiner performance. Likewise, information technology can moderate the effect of *locus of control, emotional stability, self-esteem,* and *self-efficacy* on examiner performance. Presumably, the findings of this study can be used by tax service offices to improve the performance of their examiner, that is, by utilizing information technology to meet budget realization targets. Academics, too, can support new knowledge as well as support theory.

Keywords: *locus of control, emotional stability, self-esteem, self-efficacy, Information Technology.*

Introduction

Taxes are Indonesia's primary income source for various community and government needs. Statistical data published by the Ministry of Finance of the Republic of Indonesia state that the contribution of taxes in the structure of the State Revenue and Expenditure Budget (APBN ~*Ind.*) is quite significant. Meanwhile, tax revenues in Indonesia are still low compared to other countries, including ASEAN. This can be seen from Indonesia's tax ratio. In 2021, Indonesia's tax ratio will be 8.33 percent, and in 2022 it will be 9.11 percent. The trend of increasing taxation is expected to continue in 2023, so that tax revenues in 2023 are targeted at IDR 1,510,001.2 billion (Ministry of Finance, 2022). The tax ratio for the majority of ASEAN countries is above 12 percent. The tax ratio of developed countries, for example Western Europe, even reaches 41 percent in 2021 (five countries with the highest tax ratio in the world: France, 47.2 percent; Denmark, 47.1 percent; Belgium, 45.2 percent; Sweden, 43.4 percent; and Italy, 43.1 percent) (OECD, 2022).

Tax is one of the primary sources of state revenue used for national development; thus, research in taxation is critical. Although tax revenues have consistently been below expectations over the past five years, they have increased to nearly 70% of domestic revenues. One attempt to anticipate the possibility of taxpayer fraud is through tax audits (Ilyas & Wicaksono, 2015). The phenomenon shows that the performance of tax examiners at each Tax Service Office (KPP ~*Ind.*) in the Sulawesi region, of the 25 Tax Service Offices, only ten offices have achieved 100% audit completion. The remaining 15 offices have not yet reached 100% audit completion. Since tax is the primary source of state revenue, the government's expectations regarding the role of tax will not be fulfilled if the performance of tax auditors in carrying out audits is below standard. The researcher is interested in determining the factors that can improve the performance of tax auditors by examining the significance of the role played by auditors.

This research focuses on psychological factors, which include personality and job satisfaction. Core Self-Evaluation (CSE) has the four most popular characteristics of concern: (a) locus of control, (b) emotional stability, (c) self-esteem, and (d) self-efficacy. Results of previous

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research show that there are still several differences in research findings. Locus of control and self-efficacy significantly influence organizational performance and commitment (Yoon et al., 2020), while emotional stability does not significantly affect performance. Research by Au 2015 found locus of control and self-efficacy affect performance, so if locus of control and self-efficacy increase, performance will increase. Sari et al. (2016) also found the same results in their research: self-esteem had a positive and significant effect on performance. A different thing was found by Budiman (2016) that locus of control did not affect performance. Judge & Bono's (2001) research found a significant simultaneous influence of self-esteem on performance.

It contrasts the results obtained by Frinelya et al. (2015), who stated that self-esteem does not affect performance because they have a low working period and do not have experience in the same field. Ezra's (2017) research shows that self-esteem does not influence performance. Current advances in information technology significantly contribute to society's welfare as a whole, and this is the basis for applying information technology variables. The Directorate General of Taxes (DJP ~*Ind.*) has also used information technology, namely the *Approweb* application, to make carrying out audits easier. Based on the Circular Letter of the Directorate General of Taxes SE-01/PJ/2012, *Completing the Approweb Application as a Means of Creating and Updating Taxpayer Profiles*, the web-based profile application (the Approweb) must be used in the environment to facilitate monitoring and deepening of prospective taxpayers. Considering all these things, this research aims to fill the gap in previous research by examining the influence of locus of control, emotional stability, self-esteem, and self-efficacy on examiner performance and information technology moderating this influence.

Theoretical Framework of the Research

Attribution Theory

Attribution theory is about determining the causes and thought processes in the way individuals behave. Luthans (2006) argued that this theory talks about how someone explains the reasons for the behavior of others or themselves, and such reasons can come from inside: character and attitudes; or, from outside: pressure from certain situations or circumstances that will influence individual behavior. Just as in attribution theory, a person's reasons for the events they experience can help them understand how the events affected them.

Basically, attribution theory states that when individuals observe someone's behavior, they try to determine whether the behavior is caused internally or externally (Purnaditya & Rohman, 2015). Internally-caused behaviour is under the individual's control in a conscious state, such as personality traits, consciousness, and abilities. In contrast, externally-caused behavior is influenced from outside, meaning that individuals will be forced to behave due to the situation or environment, such as social influence from other people.

This theory also shows that the causes of success or failure in implementing previous tasks cause the expected performance in the future. This theory assesses the attribution of tax auditor behavior concerning their personality traits, such as --in this case-- the locus of control, emotional stability, self-esteem, and self-efficacy.

Technology Acceptance Model (TAM)

Much attention has come from adopting information technology, considering the increasing competition and rapid exchange of information. Technology involvement influences work performance and increases productivity (Lai, 2017; Ho et al., 2019; Taherdoost, 2018). Figure 1 below is the *Technology Acceptance Model (TAM)* introduced by Davis (1989).

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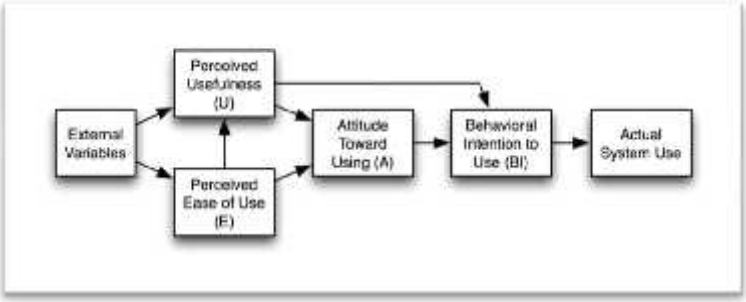

Figure 1. TAM Model (Davis, 1989).

Figure 1 shows that *Technology Acceptance Model (TAM)* is an adaptation of *Theory Of Reasoned Action* (TRA) and is explicitly adapted to model user acceptance of Information Systems (IS) by clarifying the creation of computer acceptance which is usually also equipped to define user behavior at various end goals.
Technology Acceptance Model (TAM) assumes that when users use the new information system, it is then influenced by two factors as follows:

Perception of Ease of Use
When applied to a library information system, it means that the user believes that it is easy to use, so that it does not require much effort and will be free from difficulties. It includes the ease of using the information system according to the user's wishes. Davis' research results show that the perception of ease of use can explain users' reasons for using the system and can explain whether users can accept the new system.

Perception of Usefulness
It means users believe using the library information system will improve their performance. It illustrates the benefits of the system from its users related to various aspects. Thus, this perception of usefulness forms a belief in using the information system. The assumption is that the user will use it if they believe the system is functional. On the other hand, they do not use it if they do not think it is functional.

Core Self-Evaluations

Core Self-Evaluation is a model of individual personality that influences a person's motivation and performance, which shows its influence on individual behavior in the workplace. Individuals with positive core self-evaluation will perform better due to their more ambitious goals, commitment, and persistence to achieve them. The core self-evaluation personality model is essential to study to understand and predict one's work attitudes and behavior (Judge & Bono, 2001). Core Self-Evaluation shows that individuals have different views about whether they like or dislike themselves and consider themselves capable and effective (Robbins & Judge, 2018). Individuals with high core self-evaluation will more effectively overcome obstacles by using better problem-solving strategies to minimize stress. Individuals with this personality trait will be more motivated to do their jobs. These individuals will do their jobs better due to increased confidence in their abilities. They can also understand and predict a person's work attitudes and behavior.

Information Technology (IT)

Information technology is computers and other electronic devices that store, retrieve, transmit, and manipulate data (Romney & Steinbart, 2016). Information Technology (IT) is the

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technology used to process and process data, which will then produce information used in decision-making. TAM has proven to be a helpful model in helping understand that users will accept useful technology by providing specific benefits to improve their performance (Amadu et al., 2018; Dumpit & Fernandez, 2017).

Conceptual Framework and Hypothesis Development

Locus of control on examiner performance moderated by information technology

Attribution theory, which is related to locus of control, explains a person's behavior towards events around them and knowing the reasons for carrying out such behavior. This theory is intended to analyze a person's success and failure based on internal and external factors in the locus of control. Locus of control is a person's perspective on an event, whether they can control the events that happen to them. Previous research by Kreitner & Kinicki (2014) shows that the results achieved by an internal locus of control come from its activities. Wuryaningsih and Kuswanti (2013) said that individual performance will be better if employees have a locus of control. Locus of control is essential in improving performance (Gurendrawati et al., 2014). Appiah and Addai (2014) stated that employees with a high internal locus of control will have a higher contextual performance rating than those with a lower one. Rahayuningsih (2016) states that the stronger the locus of control, the stronger the employee's performance.

The Technology Acceptance Model (TAM) is used in the application of a technological context, where it is an information system that facilitates the performance of a person or organization and makes it easier to complete work. Tarek & Basuony (2017) concluded that using information technology can increase the productivity of examiners in carrying out each stage of the audit task. Thus, there is a relationship between the use of information technology and performance. Moon et al. (2014) stated that using information technology in public sector organizations will increase time efficiency in obtaining information, decision-making, and work effectiveness. Therefore, the first hypotheses of the present study are as follows:

Hypothesis 1a: Locus of control positively and significantly affects examiner performance.

Hypothesis 1b: Information technology moderates the effect of locus of control on examiner performance.

Emotional stability on examiner performance moderated by information technology

Attribution theory, concerning emotional stability, basically explains behavior caused by internal factors, i.e., behavior that is believed to be under control or originating from within the individual themselves; not easily anxious, tense, or frustrated. Individuals with stable emotions have personalities that include being able to handle stress well, not easily disappointed, calm in stressful situations, and not easily depressed (Purnomo & Lestari, 2010). Oriarewo et al. (2018) show that good employee performance is a product of emotional stability. This study also suggests that emotional stability stages will improve organizational employee performance. Emotions such as frustration, interest, and trust are neither instantaneous nor last as long as moods. Emotions are brief synchronized body and mind changes that affect employee performance instead. Research by Pervez (2010) states that Emotional stability allows a person to understand other people's emotions and helps control their own emotions in different scenarios. Jinalee & Singh (2019) and Oriarewo et al. (2018) stated that organizations must be determined to monitor a culture that builds the emotional stability of their employees. Emotional stability is one of the characteristics of emotional maturity which is defined as a stable emotional condition (Andryani & Purwanti, 2021). Therefore, the second hypotheses of

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this study are proposed as follows:

Hypothesis 2a: Emotional stability positively and significantly affects examiner performance.

Hypothesis 2b: Information technology moderates the effect of emotional stability on examiner performance.

Self-esteem on examiner performance moderated by information technology

Attribution theory, concerning self-esteem, explains how humans judge people differently, depending on what meaning is attached to a particular behavior, which can be caused by internal factors, namely the individual's personality. When someone believes that success is due to their inner abilities, they can feel proud of their achievements. Sebayar & Sembiring (2017) and Widyawati & Karwini (2018) state that self-esteem has a positive and significant influence on employee performance. In other words, the better the self-esteem an employee has, the more their performance will improve, and vice versa; the worse their self-esteem is, the lower their performance will be. Kreitner & Kinicki (2014) confirmed that feelings of self-esteem are, in fact, formed by our circumstances and how other people treat us. Self-esteem is related to rational assessment of oneself and is the most essential element underlying a positive self-concept (Zeigler-Hill et al., 2013).

Self-esteem is an attitude, an evaluative component towards oneself, and a practical assessment of self-concept, which is based on self-acceptance and feelings of worth, which then develop and are processed as a consequence of awareness of abilities and reciprocity from external society. Self-esteem consists of beliefs about an individual's ability to think and face the fundamental challenges of life, as well as their confidence to be happy, feel worthy, and, of course, valid for society and the environment. Therefore, the third hypotheses of this study are as follows:

Hypothesis 3a: Self-esteem positively and significantly affects examiner performance.

Hypothesis 3b: Information technology moderates the effect of self-esteem on examiner performance.

Self-efficacy on examiner performance moderated by information technology

Attribution theory, concerning self-efficacy based on internal factors such as ability or effort, explains that someone with high confidence in the ability to act, intending to do it, and trying to complete their actions, it will be assumed that this is related to their nature, so that their actions can be predicted in the future. Research by Ardanti & Rahardja (2017) found that self-efficacy positively impacts performance. It is because self-efficacy is each individual's belief in carrying out the tasks given. However, according to Sihombing et al. (2018), self-efficacy does not have a significant influence at *PT. PLN* of South Manado Area. Wirjono's (2010) research states that self-confidence significantly influences employee performance with the use of information technology as a moderating variable. It shows that using information technology has a positive effect (strengthens) on the influence of self-efficacy on employee performance. Research by Gonzales & Gidumal (2017) states that information technology plays a crucial role in performance, and self-efficacy positively influences the performance of employees who rely on information technology to complete employee tasks. Rantansari (2019) stated that self-efficacy influences performance. Moderate use of information technology can moderate workplace ostracism and self-efficacy toward employee performance in a positive way (strengthening). In other words, performance will increase if individuals use IT with confidence. Therefore, the fourth hypotheses of the present study are proposed as follows:

Hypothesis 4a: Self-efficacy positively and significantly affects examiner performance.

Hypothesis 4b: Information technology moderates the effect of self-efficacy on examiner

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performance.

Based on the theoretical foundations and the identification of the main variables of the research and the mentioned hypotheses, the proposed conceptual model of the research is designed and formulated as follows (Figure 2).

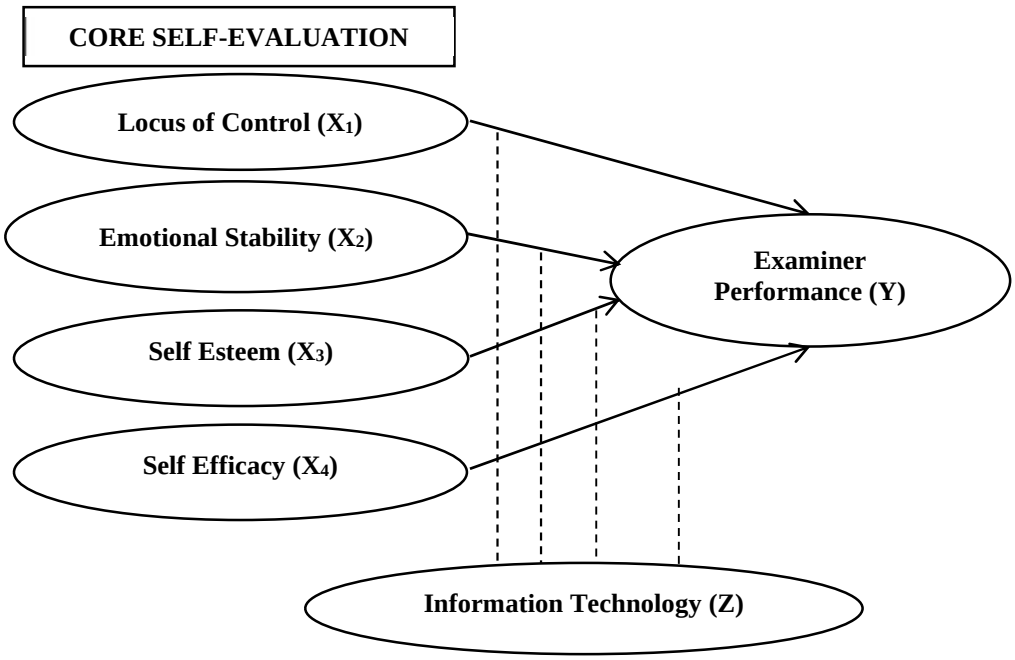

Figure 2. The Conceptual Model

Research Methodology

Method, Sample, and Data

This study is quantitative research. According to Sekaran (2017), quantitative research is a scientific method whose data are numbers that can be processed and analyzed using mathematical or statistical calculations. This research describes the influence of locus of control, emotional stability, self-esteem, and self-efficacy on examiner performance, and information technology moderates this influence. Population is a group of people or exciting things researchers want to study (Sekaran & Bougie, 2016). In this research, the population is tax examiners registered at the Tax Service Office in Sulawesi, Indonesia. A sample is a subset of a population (Sekaran, 2017). The sampling technique is the process of selecting several samples from the sample population and understanding their properties or characteristics, which can generalize the features or parts of a population (Sekaran & Bougie, 2016). This research uses non-probability sampling with saturated sampling (census) for the sampling technique. The sample used in this research is 265 tax examiners at each tax service office throughout Sulawesi.

This research uses the questionnaire method. Questionnaires are distributed online by entering the official website of each tax service office. The confidentiality and anonymity of respondents are guaranteed to reduce the possibility of standard method variance. For this purpose, an online questionnaire is used so that no specific specifications can reveal the identity of the person or company included. As a pre-test, 40 respondents from the statistical sample are asked to fill out a questionnaire to determine possible ambiguity in answers regarding

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questionnaire items; the results are pretty satisfactory. All respondents answer entirely. The analysis method uses *Structural Equation Modeling* (SEM) according to the theory of Hair et al. (2020), which states guidelines for determining sample size in SEM analysis: the sample size of 225 – 450 is for the maximum likelihood (ML) estimation technique.

Table 1 shows the characteristics of the representatives of the firms participating in the survey to obtain an appropriate overview of the research findings, gender, age, education, and years of service.

Table 1. Demographic Characteristics (n = 265)

No.	Characteristic	Criteria	Frequency	Percentage (%)
1.	**Sex**	Male	193	72.8%
		Female	72	27.2%
		Total	**265**	**100%**
2.	**Age**	21 - 30 years old	15	5.6%
		32 - 40 years old	76	28.7%
		41 - 50 years old	158	59.6%
		>50 years old	82	30.9%
		Total	**265**	**100%**
3.	**Education**	Associate's Degree (diploma)	10	3.7%
		Bachelor's Degree (applied science)	2	0.7%
		Bachelor's Degree (undergraduate)	236	89%
		Master's Degree (graduate)	17	6.4%
		Total	**265**	**100%**
4.	**Work Period**	3 - 7 years	25	9.4%
		7 - 12 years	192	72.4%
		12 - 17 years	167	63%
		Total	**265**	**100%**
5.	**Tax Service Office (KPP)**			
	Regional Office of Sulawesi (South, West, and Southeast)		32	12.1%
	KPP Madya Makassar		29	10.9%
	KPP Makassar Utara		13	4.9%
	KPP Makassar Selatan		14	5.2%
	KPP Makassar Barat		14	5.2%
	KPP Maros		7	2.6%
	KPP Parepare		7	2.6%
	KPP Palopo		7	2.6%
	KPP Watampone		7	2.6%
	KPP Bantaeng		7	2.6%
	KPP Bulukumba		7	2.6%
	KPP Majene		6	2.2%
	KPP Mamuju		6	2.2%
	KPP Kendari		12	4.6%
	KPP Kolaka		7	2.6%
	Regional Office of Sulawesi (North, Central and Gorontalo)		23	8.6%
	KPP Palu		6	2.2%
	KPP Tolitoli		6	2.2%
	KPP Luwuk		7	2.6%
	KPP Poso		7	2.6%
	KPP Kotamobagu		7	2.6%
	KPP Bitung		13	4.9%
	KPP Manado		14	5.2%
	KPP Gorontalo		7	2.6%
		Total	**265**	**100%**

Source: Data by process, 2023.

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Measurement

In this study, all scales are entirely adapted from the literature, and questionnaires with 51-item statements are prepared to measure the six latent constructs in the conceptual model. The locus of control is measured by 5-item statements, emotional stability is measured by 8-item statements, self-esteem is measured by 9-item statements, self-efficacy is measured by 9-item statements, and examiner performance is measured by 9-item statements. At the same time, information technology is measured with 11 statement items. All constructs in the model are measured using a 5-point Likert scale (from *Strongly Disagree* to *Strongly Agree*).

Findings

This research will analyze the influence of locus of control, emotional stability, self-esteem, and cell efficacy on examiner performance with information technology as a moderating variable using *Structural Equating Modeling (SEM)* analysis techniques. Latan et al. (2013) state that the SEM analysis stage must undergo at least five steps: model specification, identification, estimation, evaluation, and modification. Each of these stages can be described as follows:

Model specification

This stage forms a model that describes the relationship between one latent variable and other latent variables, as well as latent variables and indicator variables, based on a previously proposed solid theory. All Structural Equating Modeling (SEM) components in this research model are shown in Figure 3 as follows:

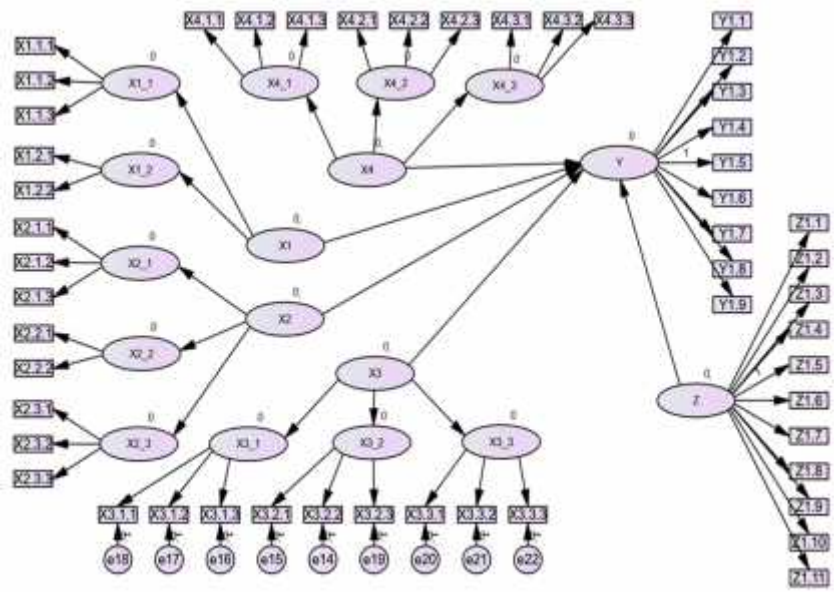

Figure 3. Research Model Specification

Nonetheless, this research aims to identify the moderating variables' effect. Moderating variables can affect the relationship between exogenous and endogenous latent variables. This study uses the moderation variable testing method in the form of a single indicator interaction: the Ping method. Indeed, the full model in this research contains a single indicator as part of moderate

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structural equation modeling. Merging all *Structural Equating Modeling* (SEM) components into a complete model illustrates the full model in one path diagram shown in Figure 4 as follows:

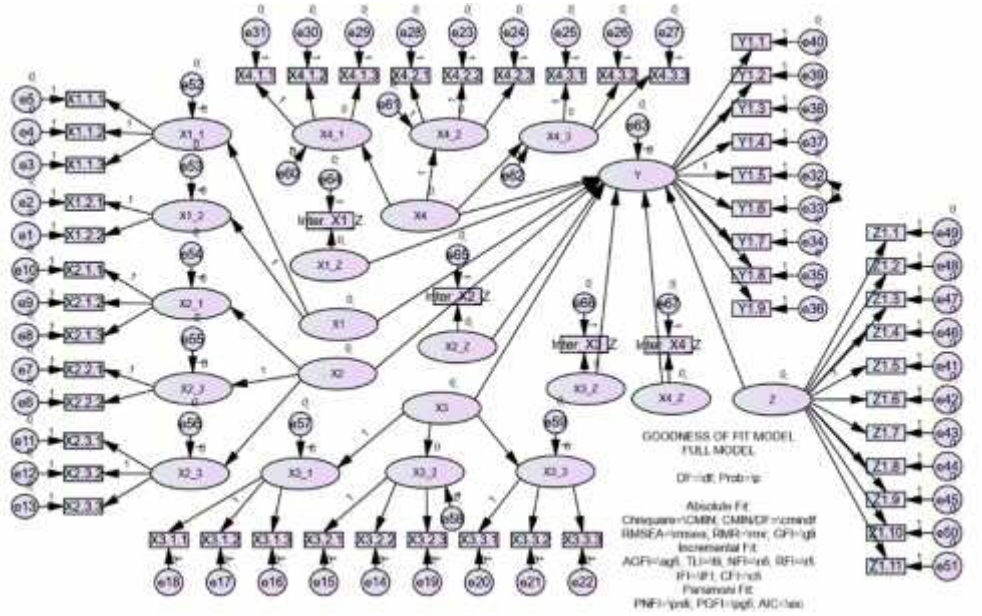

Figure 4. Full Model Specification

Structural Model

To sum up, the goodness-of-fit criteria for each group can be presented in the following table:

Table 3. Goodness-of-Fit Criteria Indices Overall Model

Goodness-of-Fit Index	Cut-Off value
X² Chi-Square	≤ 1463.41
Probability	≥ 0.05
CMIN/DF	≤ 2.00
RMSEA	≤ 0.08
TLI	≥ 0.95
NFI	≥ 0.90
CFI	≥ 0.95

Source: Secondary Data by process, 2023

The structural model in this study based on the analysis results is as follows:

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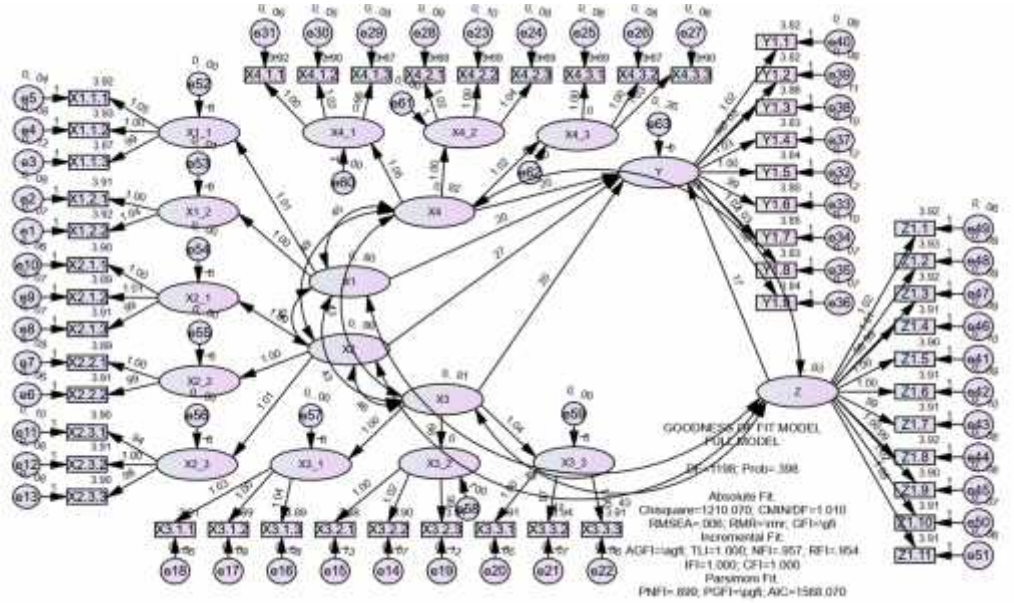

Figure 5. Estimation Results of Structural Model

SEM with maximum likelihood estimation requires many samples, and the data must be normally distributed multivariate. Bayes estimation method can be done with a small number of samples and not normally distributed. With many samples, the Bayes estimation method results will be close to the maximum likelihood method (Ghozali, 2014: 330). The results of the analysis from the maximum likelihood and the Bayes approaches can be presented in the following table and figure:

Table 4. Influence Analysis Results with the Maximum Likelihood Approach

			Estimation	SE.	CR.	P	Label
Examiner_Performance	<---	Self_Efficacy	0.197	0.049	3.988	***	par_46
Examiner_Performance	<---	Locus_of_Control	0.186	0.047	3.963	***	par_47
Examiner_Performance	<---	Emotional_Stability	0.274	0.050	5.522	***	par_48
Examiner_Performance	<---	Self_Esteem	0.200	0.048	4.195	***	par_49
Examiner_Performance	<---	Information_Technology	0.171	0.048	3.595	***	par_50

Source: AMOS Data Results, 2023

SEM Moderation Analysis

The results of each calculation of the interaction parameters λ and δ for each interaction variable are presented in the following table:

Table 5. Calculation Results of Interaction Parameters

Interaction Variable	Interaction λ	Interaction δ
X1-Z	16,192	64,522
X2-Z	19,019	118,326
X3-Z	20,149	144,049
X4-Z	20,198	141,722

Source: Data Process Results, 2023

The next step after determining all the λ and δ interaction parameters is to build interaction

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variables in the research model and analyze them further, as in the full model as follows:

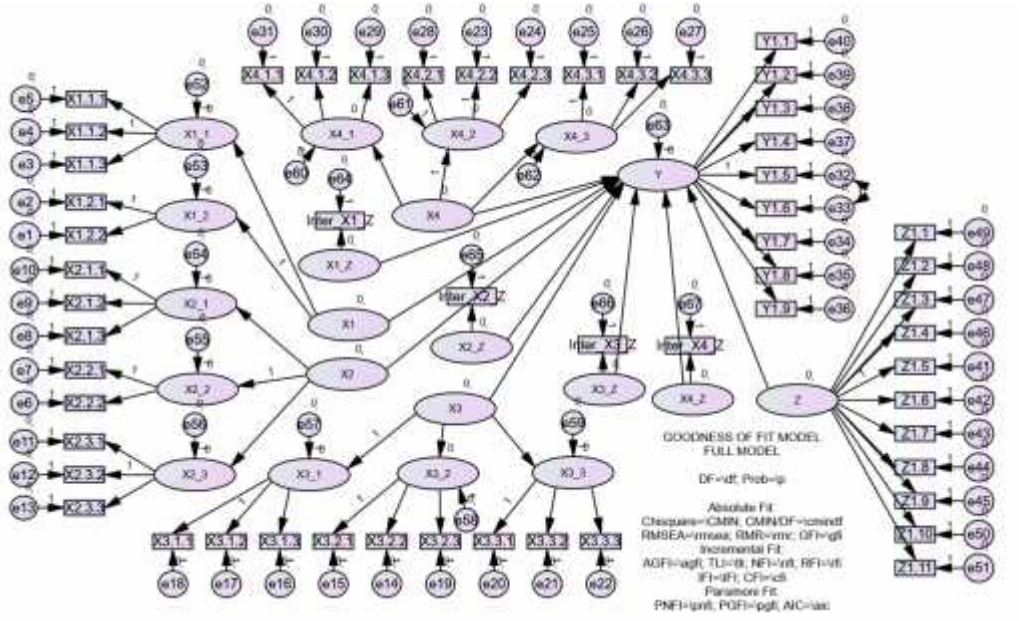

Figure 6. Full research model with interaction variables

Hypotheses Test

The lower and upper bound credible interval values become the standard for decision-making in testing the built hypotheses. Ghozali (2014) states that the effect is not statistically significant if the lower and upper bound ranges contain 0 (zero). Therefore, H_0 is accepted if the lower and upper bound interval ranges contain 0 (zero). Conversely, H_a is accepted if the lower and upper bound range intervals do not contain 0 (zero).

Table 6: Hypotheses Test

Hypothesis			Standardized Estimation	50% Lower bound	50% Upper bound	Result
Locus of Control	→	Examiner Performance	0.177	0.142	0.207	Supported
Emotional Stability	→	Examiner Performance	0.255	0.224	0.297	Supported
Self-Efficacy	→	Examiner Performance	0.187	0.149	0.216	Supported
Self-Esteem	→	Examiner Performance	0.182	0.148	0.216	Supported
Information Technology	→	Examiner Performance	0.111	0.078	0.145	Supported
Moderation X1-Z	→	Examiner Performance	0.001	0.001	0.001	Supported
Moderation X2-Z	→	Examiner Performance	0.001	0.001	0.001	Supported
Moderation X3-Z	→	Examiner Performance	0.001	0.001	0.001	Supported
Moderation X4-Z	→	Examiner Performance	0.001	0.001	0.001	Supported

Estimation uses the Bayes SEM.

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Table 6 shows that, in the Bayes approach, the value of the credible interval lower and upper bound is the primary concern to determine the influence of exogenous variables on endogenous variables. Ghozali (2014) states that if the lower and upper bound interval range contains 0 (zero), the effect is not statistically significant.

The influence analysis using the Bayes approach above shows that the lower and upper bound interval range values do not contain the number 0 (zero). Therefore, these results are not much different from the maximum likelihood approach with the Bayes approach, where the results of all exogenous variables (locus of control, emotional stability, self-efficacy, self-esteem, and information technology) have a positive and significant effect on the endogenous variables (the examiner performance). The influence of locus of control on examiner performance is 0.177, emotional stability on examiner performance is 0.255, self-esteem on examiner performance is 0.187, and self-efficacy on examiner performance is 0.182.

Discussion

Psychological research uses the majority of studies regarding personality models. This research is similar to the one by Yoon et al. (2020), who focused on the influence of core self-evaluation on sales performance. It is the first research that examines the influence of core self-evaluation, including locus of control, emotional stability, self-esteem, and self-efficacy, on the performance of tax examiners in Indonesia. Meanwhile, this research investigates the moderating role of information technology in the relationship between locus of control, emotional stability, self-esteem, and self-efficacy with examiner performance.

Several hypotheses are tested based on previous literature to test the research model. Testing the research hypotheses can determine that the *Locus of Control* variable with a path coefficient of 0.177 has a positive and significant effect on examiner performance, and this is in line with the findings of D.P.A. Takndare & I.K. Yulita (2019), Agustina et al. (2022), and Delgado et al. (2022). The *Emotional Stability* variable with a path coefficient of 0.255 positively and significantly affects examiner performance, which is also in line with other studies (Pervez, 2010; Oriarewo et al., 2018; Jinalee & Singh, 2019). The *Self-Esteem* variable with a path coefficient of 0.187 positively and significantly affects examiner performance, and this is in line with the findings of Brown (2014), Sebayar & Sembiring (2017), and Widyawati & Karwini (2018). The *Self-Efficacy* variable with a path coefficient of 0.182 positively and significantly affects examiner performance, which is also in line with other research (Ardanti & Rahardja, 2017; Sihombing et al., 2018).

Besides, other hypothesis tests show that information technology can moderate the influence of locus of control, emotional stability, self-esteem, and self-efficacy on examiner performance, with a path coefficient value of 0.001 and a posterior distribution value in the middle of the polygon graph around 0.0008. These results are in line with the findings of Tarek & Basuony (2017), Moon et al. (2014), Gonzales & Gidumal (2017), and Rantansari (2019). In general, locus of control, emotional stability, self-esteem, and self-efficacy influence examiner performance, and information technology moderates this influence. The theoretical implications of this study's results align with the theory of attribution since the researchers conduct empirical research to determine the factors that influence performance, especially in the individual personality model.

Internal and external attributions have been stated to be able to influence individual performance evaluation. For example, determining a person's self-confidence in doing their jobs and how they can control their emotions in doing their jobs will influence individual attitudes and satisfaction with their jobs. People will behave differently if they perceive their internal attributes more than their external attributes. Basically, the personal characteristics of an employee are one of the determinants of the performance that will be carried out since it is an internal factor that encourages a person to carry out an activity.

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In addition, this research is also in line with the TAM Model, which can illustrate that information technology makes work easier to complete. It is in line with the TAM model, which has been proven helpful in understanding that users will receive useful technology by providing specific benefits to improve their performance (Amadu et al., 2018; Dumpit & Fernandez, 2017).

Conclusion

Taxes are Indonesia's primary income source for various community and government needs. Taxes are one of the primary sources of state revenue used for national development. Therefore, it requires examiners with good performance to collect tax revenue according to what has been budgeted. The experimental findings of this research provide valuable implications for academics and practitioners.

This study proposes a theoretical framework that combines the core personality concepts of self-evaluation, individual performance, and information technology. This study uses information technology to moderate the relationship between core self-evaluation, including locus of control, emotional stability, self-esteem, and self-efficacy, with individual performance, i.e., the examiner. Based on the resource and knowledge view, this research extends the literature by exploring the notes of previous research findings.

The researchers collect the data using quantitative research by distributing questionnaires to tax examiners. The variant-based structural equation modeling results confirm that locus of control, emotional stability, self-esteem, and self-efficacy affect examiner performance. In addition, the analysis results support the moderating role of information technology in the relationship between locus of control, emotional stability, self-esteem, self-efficacy, and examiner performance.

Theoretical and Practical Implications

This research can fill existing gaps in the literature and contribute by identifying factors that are significantly related and influence the improvement of examiner performance, i.e., the core self-evaluation moderated by information technology. This research develops a model of dimensions based on attribution theory and the Technology Acceptance Model (TAM). This research expands previous research by including the variables *Locus of Control, Emotional Stability, Self-Esteem, Self-Efficacy,* and *Information Technology* on examiner performance. Moreover, there is a novelty in the use of rules.

Hopefully, the practical implications of this research can be considered for the Tax Service Office (KPP) in the Sulawesi Region regarding the influence of core self-evaluation on examiner performance with information technology moderation. Core self-evaluation can help motivate examiners at the Tax Service Office (KPP) in the Sulawesi Region to improve examination performance. Information technology can facilitate examiners for convenient examinations.

This research can also help the Tax Service Offices (KPP) Representatives of South, West, Central, Southeast, North, and Gorontalo of Sulawesi consider improving the quality of examiners to realize the targeted examination in the future. Furthermore, this research can be used as reference material for further research to contribute to the development of accounting science, especially in tax examination.

Limitations and Future Research

The limitation of this research is the difficulty in obtaining data quickly and precisely due to the respondents' busyness, and it takes quite a long time to collect the questionnaires. The number of research samples is quite limited, at 25.76% of the total number of tax examiners in Indonesia;

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therefore, the results obtained cannot be generalized to different research sites. Furthermore, controlling respondents through survey methods is challenging, and respondents' answers may cause bias. Accordingly, further research can increase the number of samples and expand the scope of study in several provinces or even throughout Indonesia. Future research can test and analyze many other factors that have not yet been accommodated in this research model, such as independence, obedience pressure, ethical perception, and others affecting examiner performance. Consequently, further research can use methods other than surveys or combine them with others.

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Investigating Students' Perceptions of Online Learning Use as a Digital Tool of Education Sustainability during the COVID-19 Pandemic

Waleed Al-Rahmi* , Mohammed Ayid Alqahtani, Mahdi Mohammed Alamri and Amer Mutrik Sayaf

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Keywords: Information System (IS) Success Model, sustainability, COVID-19 pandemic, E-learning system, Structural equations modeling (SEM)

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Reviewer 1: Zaitul Zaitul
Independent review report submitted: 03 Apr 2022
Interactive review activated: 27 Apr 2022
Review finalized: 12 May 2022

Initial recommendation to the Editor: Minor revision is required

EVALUATION

Q 1 **Please list your revision requests for the authors and provide your detailed comments, including highlighting limitations and strengths of the study and evaluating the validity of the methods, results, and data interpretation. If you have additional comments based on Q2 and Q3 you can add them as well.**

Reviewer 1: Zaitul Zaitul | 03 Apr 2022 | 10:57 #1

1. Abstract:
a. the study also investigates the mediating role of PEU and PU between IS variables and BIU and AUE, but there is no result about the mediating role. (473 is not a small sample)
2. The article aims to investigate the effectiveness of the TAM and IS model to have sustainability viability of the e-learning system (behavioural intention and actual usage) during covid19 in KFU and BU. Some need to be explored
a. There is no explanation of e-learning system phenomena in that country, especially in KFU and BU.
b. There is no justification why students in KFU dan BU as respondent
c. The research gap has been included in the research background, but the explanation is limited, and it also needs to see the interaction of the TAM and IS model in another setting.
3. Research model and hypothesis development:
a. We need to explore a bit about TAM and SI model to ensure this model/theory are underpinning theory for this research
b. Hypotheses statement should be placed after explanation of variable.
c. Consider the directional hypothesis since the TAM and SI model have predicted signs of this relationship.
4. Material and method:
a. To test the pilot study, it should also assess the item's validity before going for reliability (Cronbach alpha).
b. Usable questioner 473; however, eight respondents did not use e-learning (Table 2). Therefore, they did not have experience in using e-learning. The number of questionnaires should be deducted by 8.
c. If the article uses SEM-AMOS, it should first explain the analysis procedure/steps and follow the process.

5. Result
a. If it uses the measurement model, it should compose two evaluations: convergent validity (factor loading, Cronbach alpha (CA), composite reliability (CR) and average variance extracted-AVE), and discriminant validity (Fornell-Lacker criterion and cross-loading)
b. Figure 3 (path coefficient, e.g. SYQ -> PEU =0.14) is different with beta (in table 5, SYQ -> PEU=0.113)..check for rest.

measurement.
6. Conclusion:
a. 473 questioner is not a small sample; therefore, the mediation analysis is adequate to be conducted.

Q 2 Check List

Reviewer 1: Zaitul Zaitul | 03 Apr 2022 | 10:57 #1

a. Is the quality of the figures and tables satisfactory?
- Yes

b. Does the reference list cover the relevant literature adequately and in an unbiased manner?
- Yes

c. Are the statistical methods valid and correctly applied? (e.g. sample size, choice of test)
- Yes

d. Is a statistician required to evaluate this study?
- No

e. Are the methods sufficiently documented to allow replication studies?
- Yes

QUALITY ASSESSMENT

Q 3	Rigor
Q 4	Quality of the writing
Q 5	Overall quality of the content
Q 6	Interest to a general audience

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ORIGINAL RESEARCH article
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Investigating Students' Perceptions of Online Learning Use as a Digital Tool for Educational Sustainability During the COVID-19 Pandemic

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Previous research on e-learning in underdeveloped countries has seldom taken a comprehensive approach. A literature review of recent published research in the field of e-learning use during the COVID-19 epidemic is also included in this study. Therefore, the aim of this

of perceived ease of use (PEU) and perceived usefulness (PU), affect students' behavioral intention to use (BIU), and actual use of an e-learning system (AUE) as sustainability for education during the COVID-19 pandemic. Path analysis and structural equation modeling (SEM) were used to evaluate the research model, using the data from e-learning users obtained through a survey. Participants were e-learning users from two Saudi Arabian public universities. The findings revealed that PU and ease of use were positively correlated and influenced by SYQ, SEQ, and QoL in education, and that PEU and PU were positively influenced by students' BIU and AUE system. In the sense of e-learning in developing countries, previous studies rarely looked at an integrated model. This paper also attempts to provide a recently published study in the area of the use of an e-learning system as sustainability for education during the COVID-19 pandemic. There is a lot of ongoing research.

Introduction

Education is essential for both individual growth and community sustainability. Several educational institutions began to move to online teaching during the COVID-19 outbreak to maintain continuous and effective instruction (Sahu, 2020). Students' views of online learning and their excitement for study should be evaluated for long-term online learning as online classes may substitute classroom learning for a long time. In addition, the COVID-19 outbreak has ushered in a new era of education. Even when COVID-19 is over, we may expect more online educational opportunities to emerge. Many courses at all levels of education have been pushed to switch from traditional classroom instruction to online learning (UNESCO, 2021). On the other hand, the majority of teaching faculties have no prior experience in online teaching and are unaware with the technological tools that must be used to provide online lectures (Scarborough, 2021). Furthermore, many educational institutions may lack the

an online teacher is similar to that of a classroom faculty member (Wray et al., 2008). The COVID-19 pandemic has transformed higher education. As a result, there are several opportunities to learn from the educational accomplishments of other institutions to better our collective approach to COVID-19 now and in the future. Furthermore, COVID-19 had a negative impact on student wellbeing in four countries: Cambodia, Nigeria, Oman, and Spain, causing us to look at the cross-cultural effects of COVID-19 on higher education students in Saudi Arabia.

Through the construction of an effective knowledge flow inside enterprises, e-learning systems give solutions to disseminate knowledge and information, facilitate learning, and increase outcomes (Menolli et al., 2020). Every human being may gain the information, skills, attitudes, and values required to construct a sustainable future in school through education for sustainable development. Education for sustainable development is all about incorporating major sustainable development challenges into teaching and learning (UNESCO, 2014). It also necessitates interactive teaching and learning approaches that encourage and empower students to modify their behavior and take action in the interest of long-term sustainability. As a result, e-learning for sustainable development improves skills such as critical thinking, imagining future possibilities, and joint decision-making (UNESCO, 2014). E-learning platforms, such as Canvas, Blackboard, and Moodle, are popular. Learning management systems (LMS) are enabled by these platforms. Students, employees, administrators, instructors, organizations, and other participants benefit from such systems as they aid and improve learning processes while facilitating efficient information flow (Garavan et al., 2019). Instructors and administrators can utilize features such as producing modules to arrange material and learning resources for mini-courses, or networking networks such as chats, forums, and

People also looked at

Social Media Technologies Used for Education: An Empirical Study on TAM Model During the COVID-19 Pandemic

Omar A. Alismaiel, Javier Cifuentes-Faura and Waleed Mugahed Al-Rahmi

Users' Perspective on the AI-Based Smartphone PROTEIN App for Personalized Nutrition and Healthy Living: A Modified Technology Acceptance Model (mTAM) Approach

Sofia Balula Dias, Yannis Oikonomidis, José Alves Diniz, Fátima Baptista, Filomena Carnide, Alex Bensenousi, José María Botana,

human resources development, and corporate training are all terms used in the literature to describe training or knowledge production: Garavan et al. are examples of workplace learning (Garavan et al., 2019). E-learning is described as the use of technology as a learning mediation tool that allows users to quickly acquire knowledge and interact with others through the internet (Wu et al., 2012). Online learning include computer-assisted learning, e-learning as a source of sustainability in higher education, remote learning, and online learning (Ho and Dzeng, 2010). To improve the interaction between students, teachers, and the course, online learning is conducted *via* the internet or intranet. The feasibility of e-learning in higher education is based on fostering an equitable partnership between students and teachers, allowing them to pool resources and collaborate to achieve greater success (Shipee and Keengwee, 2014) and better meet the basic educational goal of enhancing learning effectiveness and performance. As a result, students' perceptions of e-learning technology are critical, and they must be addressed before these technologies can be fully integrated into education (Ozdamli and Uzunboylu, 2014). Researchers should investigate learners' perceptions of e-learning because it provides an advantage to real educational institutions, such as schools, colleges, and universities, as well as organizations, by allowing a better understanding of key factors that influence the intentions and use of e-learning as a source of educational sustainability (Mohammadi, 2015; Al-Rahmi et al., 2019, 2020). In recent years, there has been much discussion on the relationship between the use of e-learning as a source of sustainability in higher education and corporate learning (Khandakar and Pangil, 2019; Turi et al., 2019; Xiang et al., 2020). However, there is a lack of systematic work that combines and conceptualizes the findings to help universities move from information- to knowledge-based businesses (El Kadiri et al., 2016). From virtual reality (VR) settings (Costello and McNaughton,

Petros Daras, Anagnostis Argiriou, Konstantinos Rouskas, Saskia Wilson-Barnes, Kathryn Hart, Neil Merry, Duncan Russell, Jelizaveta Konstantinova, Elena Lalama, Andreas Pfeiffer, Anna Kokkinopoulou, Maria Hassapidou, Ioannis Pagkalos, Elena Patra, Roselien Buys, Véronique Cornelissen, Ana Batista, Stefano Cobello, Elena Milli, Chiara Vagnozzi, Sheree Bryant, Simon Maas, Pedro Bacelar, Saverio Gravina, Jovana Vlaskalin, Boris Brkic, Gonçalo Telo, Eugenio Mantovani, Olga Gkotsopoulou, Dimitrios Iakovakis, Stelios Hadjidimitriou, Vasileios Charisis and Leontios J. Hadjileontiadis

Effects of extended reality on language learning: A meta-analysis

Jingying Chen, Jian Dai, Keke Zhu and Liujie Xu

use of e-learning as a sustainability strategy in higher education. College affordability, which impacts students, would grow when lifetime learning in educational institutions is supported by e-learning systems that combine self-learning methods and the integration of personalized cloud storage. To define a sustainable e-learning system, we must first identify and assess the factors and educational sustainability needs. Much research has been done on the long-term survivability of e-learning systems. However, they usually concentrate on just one aspect of long-term viability. Individual features, for example, have been studied by many academics (Kruchten, 2015), while economic factors (Downes, 2007; Koohang and Harman, 2007), and social dimensions (Littlejohn, 2003) have been studied by others. The environmental element of e-learning system sustainability was explored by Dong et al. (2009) and Roy et al. (2008). Students and innovative pedagogies that bring them closer to the social reality and its core conflicts are the focus of attention in sustainable education, according to Alcalá del Olmo and Gutiérrez Sánchez (2019). The goal is for students to have a better grasp of their e-learning environment as a result. The University should be a leading force in educating students about sustainability and the changes it necessitates. As a result, focusing on values that contribute to critical thinking and include sustainability issues in the content of subject materials *via* e-learning is a priority in education (Alcalá del Olmo and Gutiérrez Sánchez, 2019). In digital learning environments, students must also be able to engage directly in innovations, experiments, and shared experiences. All these activities are carried out with the help of modern e-learning techniques (Lee and de Vries, 2019). As a result, the success of an e-learning system is considered as the success of an information system (IS) and research on the technology acceptance model (TAM) adoption has resulted in a variety of complementary and opposing models for the adoption of studies, most of which are linked to the adoption of IS and the

Educational Equity: Evidence From an Introductory Psychology Class

Amy T. Nusbaum, Carrie Cuttler and Samantha Swindell

Analysis of the Psychological Barriers to Spoken English From Big Data and Cross-Cultural Perspectives

Wen Mao

Portuguese University. However, the authors discovered that some students had troubles in acquiring certain competencies, indicating that further studies are needed to find the optimal instructional paradigm. In Spain and the USA, Racovita-Szilagyi et al. (2010) performed e-learning experiments with 400 University teachers in the field of social work. The authors sought to discover how they felt about the possibilities of e-learning in their classrooms. Regardless of the scope or emphasis of the project, e-learning efforts face a similar difficulty in the tertiary sector (Gunn, 2010). The Saudi Ministry of Education announced remote learning for public and private schools and colleges on 8 March 2020, as a preventative and precautionary step to stop the spread of the coronavirus. It is crucial to express the first impressions of the abrupt switch to an e-learning system, as this will serve as a benchmark for future improvements. The present study's goals are to look at the students' e-learning experiences at the BU and KFU in Saudi Arabia, as well as their thoughts on the benefits and drawbacks of e-learning, as well as their suggestions for enhancing e-learning. However, *via* an inquiry of students' perceptions on e-learning systems, this research gives the high-level sustainability elements of e-learning systems: a merger of the technological acceptance model and the IS success model as sustainability in higher education. As a result, the research question is: What are the factors that contribute to the effective use of an e-learning system as a long-term educational resource? To answer this question, the researchers looked into and established a new model based on a combination of TAM and IS success models for using e-learning systems as a resource for educational sustainability.

Research Model and Hypotheses Development

E-learning is the most extensively employed methodology for accessing resources *via*

learning resources, faster communication, and academic collaboration. It has been challenging to come up with a clear definition of e-learning due to ongoing technological advancements. Many studies have attempted to define e-learning in a variety of ways. Some studies (Cidral, 2018) defined e-learning as the use of technology for the learning process, while others (Eom et al., 2012) defined it as an IS capable of absorbing a variety of educational resources *via* email, discussion, assignments, quizzes, and live chat sessions. As a result, we shall use e-learning as an IS in Figure 1. As a result, the success of an e-learning system is considered as the success of an IS. As a way to ensure the sustainability of education, the e-learning system has altered higher education teaching and learning. Davis (1989) developed TAM to explain IS/IT adoption, and highlighted two key assumptions that drive IS adoption: perceived benefit and perceived ease of use (PEU). As a result, the study's main focus is on perceived utility and ease of use acceptance. The behavior of students in e-learning environments is studied using constructivist technology adoption methodologies. TAM (Davis, 1989) and the IS performance model (DeLone and McLean, 2003) are two of the most well-known theoretical contributions to adoption analysis, and they are frequently used by researchers to use e-learning systems as a source of educational sustainability during the COVID-19 pandemic. System quality (SYQ), service quality (SEQ), quality of life (QoL), PEU, perceived usefulness (PU), behavioral intention to use (BIU), and actual use of an e-learning (AUE) were investigated in the current study (Figure 1) to see if e-learning might be employed as a long-term solution for education during the COVID-19 epidemic in higher education.

Figure 1

System Quality

System quality (DeLone and McLean, 2003) describes the organizational structure, responsibilities, procedures, processes, and resources used to achieve quality management. SYQ also refers to the technological performance, as well as the accuracy and efficiency of the information-producing communication system, according to the IS performance model established by DeLone and McLean (2003). In reality, it is connected to the presence or absence of a problem in the system and incorporates the required properties and metrics of an IS (DeLone and McLean, 2003). The quality of e-learning systems has been shown to have a considerable beneficial influence on satisfaction with education (Alsabswy et al., 2013), and Tajuddin et al. (2013) and Rapley (2003) identified a link between satisfaction with learning and the blended learning system's SYQ. E-learning systems are also expected to be a long-term educational option (Cheng et al., 2012; Alam et al., 2021). As a consequence, we projected that SYQ would increase individual satisfaction and system use intentions. As a result, the following hypotheses emerged from this research.

Hypothesis (H1): SYQ and PEU have a substantial link.
Hypothesis (H2): SYQ and PU have a substantial link.

Service Quality

The assessment of a customer's service expectations in relation to the performance of an or-overall generation's performance (DeLone and McLean, 2003). SEQ refers to the degree of service provided by e-learning systems (Wang and

recent years, it might stand alone as an independent variable (Wang and Liao, 2008). SEQ has been demonstrated in several studies to have a positive impact on e-learning consumption and a positive impact on satisfaction (Cheng et al., 2012; Tajuddin et al., 2013). In addition to the long-term educational purpose of adopting an e-learning system (Poulova and Simonova, 2014; Xu et al., 2014), in this investigation, SEQ is anticipated to have a favorable impact on both person satisfaction and intention to utilize it. The investigation demonstrated the empirical importance of the relationship between SEQ and PU stated in the conceptual model of Hagos et al. (2016). As a result, the following hypotheses emerged from this study.

Hypothesis (H3): There is a strong link between SEQ and PEU.
Hypothesis (H4): There is a strong link between SEQ and PU.

Quality of Life

The widespread use of the term "quality of life" (QoL) in a variety of settings and for a variety of purposes by academics in many professions makes it somewhat problematic (Rapley, 2003; Lwoga, 2014). Rapley (2003) examines a number of different QoL definitions at different levels of aggregation. At the individual level, he thinks that Robert Cummins' concept of QoL is the most significant (and operationalized by the comprehensive QoL scale). When determining the QoL, Cummins (Phillips, 2006) examines both subjective and objective aspects of schooling. The output and QoL success aspects (Petter et al., 2008) explain the optimal characteristics of the performance of an e-learning system. One example is the information that students will gain as a result of using the e-learning system to ensure educational sustainability. As a result, it includes indicators of the system's ability to provide high-quality information and its usefulness in terms of user satisfaction (Cummins, 1997;

people's contentment and usage intentions. As a result, the following hypotheses emerged from this study.

Hypothesis (H5): There is a strong link between QoL and PEU.
Hypothesis (H6): There is a strong link between QoL and PU.

Perceived Ease of Use

Perceived ease of use is described as a person's belief that the use of a system would be painless (Davis, 1989), and it is a significant factor in the adoption of revolutionary technological applications (Venkatesh et al., 2003). Previous research has shown that PEU influences the motivation to use e-learning technologies as a sustainable resource in higher education (Chen and Tseng, 2012; Chow et al., 2012; Naveed et al., 2020). As a result, the greater the PEU of an e-learning system, the more certain the intention to use it is, and the more probable it will be used. Through PU, PEU is also projected to have an indirect impact on the desire to utilize e-learning as a source of sustainability in higher education (Chen and Tseng, 2012). As a result, PEU is projected to have an indirect impact on users' intentions *via* PU. As a result, the following hypotheses emerged from this study.

Hypothesis (H7): There is a strong link between PEU and PU.
Hypothesis (H8): There is a strong link between PEU and BIU.
Hypothesis (H9): There is a strong link between PEU and AUE.

Perceived Usefulness

Users of twenty-first century IS are being pushed to adopt more current and consumer technologies that provide them with more flexibility as information quality is a major predictor of purpose (Pikkarainen et al., 2004). In reality, a person's willingness to use a particular e-

and Tseng, 2012; Cheng et al., 2012; Chow et al., 2012; Islam, 2012; Alalwan et al., 2019; Alamri et al., 2020b; Al-Rahmi et al., 2021a,b). As a result, the greater the PU of the use of an e-learning system as a source of educational continuity, the more positive the desire to utilize it is and, therefore, the more likely it will be used. As a result, the following hypotheses emerged from this study.

Hypothesis (H10): There is a link between PU and BIU.
Hypotheses (H11): There is a substantial link between PU and AUE.

Behavioral Intention to Use

Davis (1989) defines the strength of one's intention to engage in a given activity as "the strength of one's intention to engage in a particular action." There is a favorable effect relationship between the BIU and AUE system in higher education, according to Alkhalaf et al. (2012) and Chow et al. (2012). While there is a distinction between intention to use and system use, Petter et al. (2008) point out that in their revised model, the performance model of e-learning systems did not distinguish. As a consequence (Venkatesh et al., 2003; Cifuentes-Faura et al., 2021), supports the positive relationship between BIU and AUE. As a consequence, the intention to use is anticipated to have a positive influence on AUE in this study. As a result, the following hypothesis emerged from this study.

Hypothesis (H12): There is a strong link between BIU and AUE.

AUE System During the COVID-19 Pandemic

Actual system use is used as a metric in both DeLone and McLean's (2003) IS performance model and Davis's TAM (Kruchten, 2015). Petter et al. (2008) discovered that "usage" had a little relationship with the system's benefits in a

shown that the use of an e-learning system to provide training courses to employees has a large and favorable impact on the company's net benefits (Chen and Tseng, 2012). Other research (Kositanurit et al., 2006; Halawi et al., 2008; Al-Rahmi et al., 2017) obtained similar results. As a result, we anticipate that the use of this technique will provide students with additional benefits, such as enhanced awareness, time savings, and systematic learning management.

Materials and Methods

Study Design

Two specialists assessed the substance of the questionnaire. Before commencing the data collection, consent for research purposes was acquired from a public institution. The study's intended audience was undergraduate and postgraduate students. A questionnaire was produced for this study, and it was used to target the intended population. As a result, quantitative methods have been established to examine theoretical models and hypotheses, and this inquiry employed a quantitative analytical survey. Measurement items were created from the literature study and were designed to cover each step of the construction process. Many institutions throughout the world, including those in Saudi Arabia, have pushed for the use of e-learning platforms as a way to ensure the sustainability and profitability of higher education. As a result, the purpose of this research is to use empirical evidence to construct a model for measuring students' actions in terms of BIU and AUE. As a result, undergraduate and postgraduate students who used e-learning were included in the study's sample. For items (questions) relevant to the TAM dimensions, IS performance model constructs, and demographic variables, a five-point Likert scale was employed. A five-point Likert scale was utilized, with the options being (1) strongly disagree, (2) disagree, (3) neither agree nor disagree, (4) agree, and (5) strongly agree. Factor

questionnaires for the final test in this study, with all factors confirmed to be acceptable. Cronbach's α, according to Hair et al. (2017), is a measure of internal consistency, or how closely a group of things are connected. It is regarded as a scale dependability metric. Cronbach's α was determined to be 0.881 in this study using standardized items. Table 1 shows the Cronbach's α reliability coefficient for the pilot and final test constructions; all variables were judged to be accurate and appropriate (for further details, see Table 1).

Table 1

No.	Factors	Code	Pilot test	Final test
1	System quality	SYQ	0.725	0.893
2	Service quality	SEQ	0.734	0.875
3	Quality life	QoL	0.830	0.907
4	Perceived ease of use	PEU	0.726	0.895
5	Perceived usefulness	PU	0.832	0.909
6	Behavioral intention to use	BIU	0.886	0.914
7	Actual use E-learning system	AUE	0.801	0.921

Table 1. Reliability test (pilot and final).

Data Collection and Participants

E-learning models are created for KFU and BU institutions. This strategy ensures that e-learning and remote education are delivered to the highest standards throughout Saudi Arabia and the Middle East. Thus, to offer distant education, KFU and BU must conceive, develop, and execute a full-fledged e-learning Model. This model is used by more than 150,000 students. As a result, when the institutions were closed due to the COVID-19 epidemic, this study was done online from February to April 2021. Prior to the primary data collection, a survey instrument was devised and confirmed to look for criteria that predicted student use of an e-learning system as a source of academic sustainability. In total, 481 questionnaires were distributed among students at both universities, and eight students who did not use online learning were found. Thus, there are

University who utilized the e-learning system during the COVID-19 pandemic.

Table 2 shows the data collected from participants. In total, 171 (36.2%) of the 473 useable surveys were from male respondents, whereas 302 came from female respondents (63.8%). In addition, the institution received 264 (55.8%) responses from Bisha University and 209 (44.2%) from King Faisal University. There were 283 undergraduate students (59.8%) and 190 postgraduate students (40.2%). Furthermore, 135 (28.5%) were aged between 18 and 21, 128 (27.1%) were aged between 22 and 25, 44 (9.3%) were aged between 26 and 29, 55 (11.6%) were aged between 30 and 33, and 111 (23.5%) were above 34. In total, 269 people (56.9%) are full-time students, while 204 people (43.1%) are part-time students. In total, 173 (36.6%) students came from the department of education, 42 (8.9%) from the faculty of science, 97 (20.5%) from the faculty of arts and humanities, 30 (6.3%) from the faculty of medical science, and 131 (27.7%) from the faculty of computer science. At the time of AUE, 321 (67.9%) had used e-learning for <5 years, 85 (18.0%) for schooling during the COVID-19 epidemic from 5 to 10 years, and 67 (14.2%) for more than 10 years. Finally, 324 (68.5%) used e-learning all the time, 141 (29.8%) used it occasionally, and 8 (1.7%) did not use it at all during the COVID-19 epidemic.

Table 2

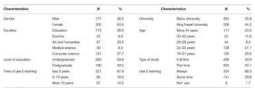

Table 2. Demographic information.

information (gender, age, educational level, and specialism) and the questionnaire items examining SYQ, SEQ, and QoL were adapted from Azeiteiro (2015). Davis (1989) was used for PEU and PU, Lin (2011) was used for action intent to use, and Venkatesh et al. (2012) and Al-Rahmi et al. (2015b) were used for the practical use of an e-learning system as education sustainability. All instruments were received from a trustworthy source. As a result, variables were evaluated by self-report using multi-item measures based on previous research.

Data Analysis Variables

The data were examined with the most recent version of IBM's SPSS. Structural equation modeling (SEM) was also used to assess the data (SEM-AMOS). Construct validity evaluation, convergent validity analysis, and discriminant validity analysis, as well as structural modeling, were used to establish the validity and reliability of the measurement models (Hair et al., 2017).

Results and Analysis

Measurement Model

The conceptual model in this study was tested using covariance-based SEM (CB-SEM). The use of CB-SEM has various benefits. CB-SEM provides three main benefits over traditional multivariate approaches: (1) explicit measurement error evaluation; (2) estimate of latent (unobserved) variables using seen variables; and (3) model testing, which enables a structure to be imposed and the data fit to be confirmed. The measurement model and the structural model were used as methodological measures. The structural model examines how e-learning is used in digital learning theories, whereas the measurement model examines construct efficiency, validity, and overall model fit. All of the measures were evaluated on a five-point Likert

Table 3

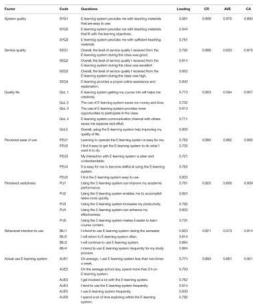

Table 3. Measurement model, item loadings, build reliability, and convergent validity.

Measures of Reliability, Validity, and Measurement Model

Table 4 illustrates that the SEM-AMOS measurement model for each concept has specific properties of reliability and validity. Using the human CFA and model fitness indicators from the measurement model, the structural model was used to calculate the strength of the connection route. The measurement components are listed in Table 2. The findings show that item dependability is typically high, with most of items exceeding the 0.70 criterion (Hair et al., 2017). The constructions' internal consistency was measured using composite reliability, which ranged from 0.821 to 0.923, above the cut-off value of 0.70 (Hair et al., 2017). The average variance extracted (AVE) for the components ranged from 0.573 to 0.681, indicating convergent validity above 0.50 (Hair et al., 2017). Researchers used cross-loading, the square root of AVE (Fornell and Larcker ratio), the average shared variance (ASV), and the maximum shared variance (MSV) tests to assess discriminant validity. The value of the diagonal is higher than the values of the accompanying row and column numbers (values are in bold in Table 4). It denotes a greater link between the building and other buildings. The MSV is lower than the ASV but

Table 4

Table 4. Discriminant validity.

Model Fit Assessment

Table 5 shows a CMN/DF ratio of 3.778, which is less than the threshold value of 5.00. The Incremental Fit Index (IFI) (0.950) is appropriate, the GFI (0.961) is reasonable, the CFI (0.946) is appropriate, and the TLI (0.938) is adequate. Root Mean Square Residual (RMR) and root mean square error of approximation (RMSEA) of 0.35 (0.05) and 0.041 (0.08), respectively, were less than the threshold, indicating a satisfactory model fit (Alamri et al., 2020a,b). All findings are shown in Figure 2, which demonstrate that the measurement model fitted the structural model well and was suitable for it.

Table 5

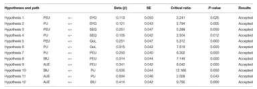

Table 5. Results of hypotheses testing.

Figure 2

Figure 2. Measurement

Path Coefficient and Structural Model

The structural model, as shown in Figure 3, defines the interaction and influence of independent factors on the dependent variable (path coefficient). Multiple connections, as well as moderating and mediating effects among multi-item variables, can be discovered using the SEM approach, particularly the maximum likelihood method (Berraies et al., 2017). The route coefficient depicts the direct influence of the latent predictor variable on predicted variables (see Figure 3). The goal of this study was to investigate and develop a new model for the use of an e-learning system as a method to ensure educational sustainability, based on a mixture of TAM and IS success models. As shown in Figure 3 and Table 5, the study contributes to the body of knowledge by giving empirical confirmation of the direct impact on learning for University students when utilizing an e-learning system as a long-term educational technique. Table 5 presents that all assumptions were supported, indicating that the use of an e-learning system as a long-term education model during the COVID-19 epidemic has a positive influence on TAM and IS success. This research also contributes to the present TAM and IS success model as sustainability in numerous ways by expanding the contributions of TAM (Davis, 1989) and the IS performance model (DeLone and McLean, 2003). TAM (Davis, 1989) and IS performance model (DeLone and McLean, 2003) are the most prominent theoretical contributions to the adoption analysis and are widely used by researchers to use e-learning systems as sustainability for education during the COVID-19 pandemic in Saudi Arabia. Table 5 presents that SYQ ($\beta = 0.113$, CR = 2.241, $p < 0.001$) has an important and positive impact on PEU, as stated in Hypothesis 1. Also, SYQ ($\beta = 0.121$, CR = 2.794, $p < 0.001$) has a positive and important impact on PU, as stated in Hypothesis 2. SEQ ($\beta = 0.251$, CR = 5.289, $p < 0.001$) has an important and positive impact on PEU, as stated in Hypothesis 3. Similarly, SEQ ($\beta = 0.105$, CR =

(β = 0.315, CR = 7.519, $p < 0.001$) has a positive and significant effect on PU, as stated in Hypothesis 6. PEU (β = 0.250, CR = 6.302, $p < 0.001$) has a positive and significant effect on PU, as stated in Hypothesis 7. As well, PEU (β = 0.314, CR = 7.148, $p < 0.001$) has a positive and significant effect on BIU, as stated in Hypothesis 8, and PEU (β = 0.341, CR = 8.042, $p < 0.001$) has an important and positive impact on AUE, as stated in Hypothesis 9. PU (β = 0.535, CR = 12.166, $p < 0.001$) has a positive and significant effect on BIU which Hypothesis 10 accepted, and PU (β = 0.094, CR = 2.028, $p < 0.001$) has a major and positive impact on AUE as stated in Hypothesis 11. Finally, BIU (β = 0.414, CR = 9.795, $p < 0.001$) has a positive and significant effect on AUE as stated in Hypothesis 12 (see Figure 3 and Table 5).

Figure 3

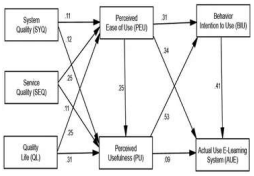

Figure 3. Structural model (*p*-value).

Description and Analysis of Factors

Standard deviation (SD) and mean are the two statistics that describe how measurements in a population deviate from the average (mean) or expected value. Data are grouped around the mean when the SD is low, while data are more spread out when the SD is large. An SD around 0 suggests that data points are close to the mean, whereas a high or low SD indicates that the data points are above or below the mean, respectively. Therefore, most of the data points are near to the mean when the SD is low. If the SD is high, the data are more dispersed. As a consequence, as

The following are the numerals' meanings: 1: "Strongly disagree;" 2: "Disagree;" 3: "Neutral;" 4: "Agree;" 5: "Strongly agree;" F: "Frequency;" %: "Percentages." According to the data, the vast majority of students are in favor or strongly agree with SYQ, as well as PU and convenience of use. As a consequence, SYQ is defined in this study as the student's view that the adoption of an e-learning system as a long-term method of education throughout the COVID-19 epidemic will improve their education (see Table 6).

Table 6

Table 6. Measuring system quality (SYQ).

The final measurement consequences are shown in Table 7; the majority of students agree or strongly agree on SEQ, PU, and PEU. As a result, SEQ is defined in this study as the student's view that the use of e-learning as a long-term educational strategy during the COVID-19 epidemic would improve their learning (see Table 7).

Table 7

Table 7. Measuring service quality (SEQ).

as a long-term educational strategy throughout the COVID-19 epidemic will improve their learning (see Table 8).

Table 8

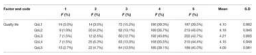

Table 8. Measuring quality life (QoL).

The final measurement findings are shown in Table 9; the majority of students agree or strongly agree with PEU, PU, BIU, and AUE. As a consequence, PEU is defined in this study as the student's perception that the adoption of e-learning as a means of sustaining education during the COVID-19 epidemic is simple and beneficial to their learning (see Table 9).

Table 9

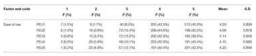

Table 9. Measuring perceived ease of use (PEU).

The final measurement results are shown in Table 10; the majority of students agree or strongly agree with the PU of the e-learning system with BIU and AUE. As a consequence, PU is defined in this study as the student's conviction that the adoption of e-learning as a means of sustaining education during the COVID-19 epidemic is

Table 10

Table 10. Measuring perceived usefulness (PU).

The effects of the final measurement are shown in Table 11; the majority of students agree or strongly agree with their BIU and AUE. As a consequence, this study describes the extent to which a student feels that the use of e-learning systems as a long-term solution for education during the COVID-19 epidemic can improve their learning (see Table 11).

Table 11

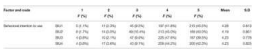

Table 11. Measuring behavioral intention to use (BIU).

The majority of students are in favor or strongly agree with the practical application of the e-learning system as sustainability for education during the COVID-19 epidemic, as shown in Table 12. As a result, AUE is defined in this study as a student's belief that the use of an e-learning system as a sustainable instrument for education during the COVID-19 epidemic is simple and beneficial, and that it would enrich their learning (see Table 12).

actual use e-learning system (AUE) as sustainability for education during the COVID-19 pandemic.

Discussion and Implications

The value-enhanced technology adoption (VETA) model was established by combining the components of the TAM and the IS success model to produce a new model, which we assessed in the context of the use of e-learning as a source of sustainability in Saudi higher education. The findings of this study add to the body of knowledge by indicating that students who enhance their e-learning system use it as a source of educational sustainability through SYQ, SEQ, and QoL. The research also contributes to the body of knowledge by establishing linkages between SYQ, SEQ, QoL, PEU, PU, BIU, and AUE values. Findings from the primary technological acceptance literature (Davis, 1989; Venkatesh et al., 2003, 2012) and past e-learning research (Al-rahmi et al., 2015a; Ching-Ter et al., 2017) support the degree and direction of the direct relationships between PEU, PU, BIU, and AUE.

By using second-order links in the TAM and IS success model, this work contributes to theory growth by bridging the gap between e-learning adoption research (Mohammadi, 2015; Abdullah and Ward, 2016; Alenazy et al., 2019) and the IS literature (Venkatesh et al., 2012). We observed that students' BIU has a positive impact on their AUE, and that independent variables SYQ, SEQ, and QoL had a positive impact on the mediator factors PU and PEU as a result of the research model. In fact, it indicates that the e-learning system has a more positive influence on students'

BIU in their research of e-learning systems as a source of educational sustainability, which fits with the findings of Rapley (2003) and Wu et al. (2012). The findings that PU has a significant impact on e-learning use intention (Chen and Tseng, 2012; Islam, 2012; Mohammadi, 2015; Al-Rahmi et al., 2019) have been verified. Despite the fact that it has been identified as a significant element in this relationship (Chen and Tseng, 2012; Islam, 2012; Mohammadi, 2015; Al-Rahmi et al., 2020), PEU was shown to have a little impact on the use of e-learning as a source of sustainability in higher education in this study. PU and PEU have direct and indirect effects on e-learning adoption, according to Sánchez et al. (2013). There is a need to increase digital sustainable development in higher education teaching, according to Sá and Serpa (2020), which implies considerable problems that higher education institutions must face and conquer if they are to be at the forefront of success in the worldwide education market. COVID-19 poses both obstacles and potential for higher education, and this paper explains both. As a result, students were unprepared for the shift, found it difficult to follow the course online, spent more time studying each day, and did worse in class (Faura-Martínez et al., 2021). Our findings show that PU has a considerable impact on students' behavioral intentions, whereas PEU has no direct impact, emphasizing the importance of usability in e-learning for education during the pandemic sustainability of COVID-19. PEU has an indirect influence on user intentions through PU, but it has no direct influence on user intentions. To put it another way, PU mediates the relationship between ease of use and user intentions, and the backdoor is the sole way to promote PEU against BIU and AUE. This study gave three empirical justifications. The empirical evidence of the use of e-learning system as education sustainability based on PEU and PU; the empirical proof of students' use actions and intentions; the empirical evidence of BIU and AUE through PEU and PU; the empirical evidence of PU and PEU e-learning system through SYQ, SEQ, and quality of life that

- PEU and PU had a beneficial influence on students' behavioral desire to utilize e-learning and actual use of the e-learning system, according to the findings.
- Students' BIU e-learning and actual use of the e-learning system were the two most relevant factors in predicting e-learning use, according to the findings. PEU and PU were not significant determinants of behavioral intention, contrary to previous studies. The PEU and usefulness are influenced by SYQ, SEQ, and QoL. As a consequence, the research model contributed to the existing body of knowledge.
- Students' behavioral intention to use e-learning increases their actual use of the e-learning system. Lecturers and supervisors may also encourage students to use e-learning platforms by clearing up misunderstandings, sharing knowledge, and offering information to assist students improve their learning experiences, performance, and research skills.
- Students should be able to complement their classroom learning with the use of e-learning platforms.
- For e-learning systems used for educational and pandemic COVID-19 purposes, higher education institutions should study IS, SYQ, SEQ, and QoL. As a result, students' perceptions of the e-learning system's ease of use and perceived utility will influence their actual usage of an e-learning system as a source of educational sustainability during the COVID-19 pandemic.

Conclusion, Limitations, and Future Perspectives

In this study, we utilized an integrated IS performance model and TAM to analyze students' perceptions of using the e-learning system as a source of educational sustainability, as well as the influence of SYQ, SEQ, and QoL on PEU and PU on students' BIU and AUE. In addition, the research model's interactions with the mediator components PE and PU positively influenced

unlike previous research in Saudi Arabia (Aljaber, 2018; Mutambik et al., 2020; Alqahtani et al., 2021), this study aims to provide a comprehensive review of recent publications in the field of e-learning as a source of long-term sustainability in higher education. Third, unlike previous research, this study focuses on the effects of variables on AUE by intention, as opposed to only looking at the effects of factors on intention to use. As a result, the current study is predicted to provide a wide range of outcomes and give crucial information about students' behavior, such as their BIU and AUE. According to our research, which was conducted at two public universities, SYQ, SEQ, and QoL had the most positive impact on BIU and AUE. Because demographic data, such as the impacts of age and gender, were not examined, it was not possible to conduct research on moderators. To analyze the effect of moderators on adoption in a broader study including many countries, institutions, or technologies, the researchers used the experimental power and data stability, as well as additional student satisfaction scores. This study has its own limits, regardless of the insights it provides. First, because this study focused on just two institutions, its conclusions should be taken with caution, as behavior at other universities (private universities, army universities, and other schools) may be different. Another drawback is the use of questionnaires to acquire qualitative data (interviews or observations). Because the data in this study were based on student viewpoints, which may differ from instructor judgments, variations in research fields were not taken into account. To overcome the study's limitations, future research might repeat the study in various countries and cultures. To investigate the similarities and contrasts between the many viewpoints of the unified theory of acceptance and use of technological variables according to context, a qualitative study would be appropriate. Further work is needed to adapt the findings to other circumstances, examine the model's breadth of applicability, and develop new applications

areas, such as m-loyalty, e-organizational software adoption, and e-readiness, as well as a larger research sample, aims to increase the current understanding of the use of IS applications.

Data Availability Statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics Statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the patients/participants legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author Contributions

AS, MAlq, MAla, and WA-R: conceptualization, methodology, investigation, resources, data curation, writing—original draft preparation, writing—review and editing, visualization, and supervision. MAla and WA-R: software. AS, MAlq, and WA-R: validation. MAlq and WA-R: formal analysis. AS and MAlq: project administration and funding acquisition. All authors have read and agreed to the published version of the manuscript.

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Publisher's Note

Abbreviations

QoL, Quality Life; SEQ, Service Quality; SYQ, System Quality; PEU, Perceived Ease of Use; PU, Perceived Usefulness; BIU, Behavioral Intention to Use; AUE, Actual Use E-Learning System; TAM, Technology Acceptance Model; IS success model, Information System (IS) Success Model; SEM, Structural Equations Modeling.

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