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Empowering E-Learning Excellence: Unveiling the Influence of Outcome Expectation, Learning Motivation, and Self-Efficacy in the Industrial Era 4.0 (IR 4.0)

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ABSTRACT

The advent of the 4th industrial revolution has fundamentally transformed various aspects of human life. The objective of this study was to examine the influence of learning motivation, outcome expectation, and self-efficacy on enhancing the quality of online learning in the context of the Fourth Industrial Revolution. The study population consisted of 250 individuals from the University of Engineering and Technology Taxila (UET) who were participating in the e-learning learning paradigm. Data was collected while using an online survey questionnaire. The data was run on Smart PLS 4.0 reveals that learning motivation, outcome expectation, and efficacy are important factors in assessing the level of education. In addition, it was found that self-efficacy played a role in mediating the impact of learning motivation on enhancing the quality of online learning. However, in other instances, self-efficacy has a significant effect on maximizing the influence on the quality of e-learning.

1. Introduction

In the 4th industrial era, the rapid growth of technological systems is growing and have an effect on all levels of human activities on daily basis. This epoch saw a surge in the digitalization of production [24], which many new trends arose that individuals may not have anticipated and became innovations, resulting in a very big business field [13]. This is exemplified through the emergence of various systems and applications in the market such as Careem, Uber, and other online applications [26].

Innovation has significantly impacted all fields of employment, particularly the realm of education. When the industrial revolution 4.0 era began, it has become both a challenge and an opportunity, with the potential to inspire innovation and the establishment of all higher education institutions (HEIs) [26], through the use of online distance learning and responding to changes, difficulties, and possibilities while taking into consideration social science and humanities [20,22].

Distance learning via online learning (e-learning) is one strategy that can be used to execute learning in elevated learning [21]. The idea of e-learning refers to a period in which traditional educational activities are being transformed into digital forms, both in terms of content and processes [14]. As a result, in order to achieve high-quality learning, instructors and students alike must possess knowledge and understanding of every step involved in enabling the usage of

information technology-based learning (IT). In other words, the primary goal of e-learning is to improve learning quality [3]. Some people believed that when the physical or face-to-face learning is no longer available, it is rather impossible for educators to optimally engage subsequently disseminate knowledge and learning through online learning.

Other issues that must be considered in learning E-Learning include infrastructure and facilities, human resources, and the availability of internet networks that allow the implementation of learning e-learning. Many elements influencing e-learning must be taken into account to optimize its quality [31]. This study identifies the learning motivation, outcome expectation, and self-efficacy variables as determinants influencing E-Learning quality. This study will also look at the indirect effect of learning motivation and outcome expectation on the quality of E-Learning using self-efficacy as a mediator.

2. Literature Review

The ability (competency) or abilities that students should possess after completing a particular learning process are, in general, the goal of learning [29]. Additionally, according to [29], the learning objectives are related to the ABCD element, which is composed of the following: Audience, Behavior, Condition, and Degree. This objective also becomes the primary one that needs to be met when learning online. E-learning is a type of remote learning that makes use of computer technology, commonly known as the Internet [18].

According to [30], one of the advantages of e-learning is the availability of various tools that could facilitate and moderate the learning sessions. This will allow instructors and students to easily connect online on a regular basis or likewise the communication activities are conducted, without being constrained by time, place, or distance. Second, educators and learners can assess one other's comprehension of a subject by using online resources or organized, scheduled learning instructions. Third, because training related stuff are stored on the computer, they may be studied or reviewed at any time and from any location if necessary.

It is anticipated that as a result of its use, student learning results will be improved by the caliber of e-learning. [9] posited that there should be at least two phases to assessing the online learning quality, also called e-learning: i) the planning, organizing, or implementation of content in the system called Learning Management System (LMS), and (ii) right after the learning process is completed. A formative assessment might be introduced between the two periods to assess the ongoing e-learning deployment. For instance, in past few years, a tool for assessing the caliber of learning objects known as Learning Object Review Instrument (LORI) is developed and introduced [2]. LORI is designed and intended to be a tool for evaluating the caliber of multimedia learning materials particularly useful for online learning activities.

While LORI is usually used as an assessment tool for learning objects rather than an evaluation tool for the entire program in which the learning object is employed, it does interact with learning objectives in its evaluation. Moreover, the quality of learning is determined by and influenced by learning motivation [28]. An image of a people or student's power and sincerity in optimizing the teaching and learning process is called directly learned motivation.

Motivation is one of the elements that impact the realization of the quality of learning, according to [11] who lists the components that determine learning quality. It is also anticipated that the current learning challenge of e-learning will be able to serve as a powerful learning incentive for students, multiplying the advantages of superior learning methods with virtually infinite boundaries in terms of content, time, and location [13]. However, because students' motivation to learn opens portals, e-learning is not always the best option. As a result, students rarely know the details given

outside of the designated online time, participate less in penal discussions, online assignments given by lecturers, and discover that some answers are simply copied and pasted from friends [28].

Outcome expectations are another aspect that might influence the quality of learning online or e-learning. Outcome expectations center on students' capacity to fully utilize information technology to enhance their understanding of novel approaches to learning. With the use of outcome expectations, teachers can inspire and urge their students to learn new things and become involved in activities that will help them reach their full potential and, inadvertently, improve the quality of the education they receive [16]). It may also indirectly alter students' learning habits and behaviors when they switch from traditional to digital formats. It is also highlighted that learning outcomes encompass behavioral modifications in the domains of emotional, psychomotor, and outcome expectations [30].

It can be concluded, then, that outcome expectation played a significant role in determining how well e-learning is executed [25]. It is claimed by [25] that self-efficacy has a strong relationship with the quality of learning. Self-efficacy can be defined as a type of confidence and self-assurance shared by all participants in the learning process to guarantee that online learning is perceived as practical, helpful, and capable of optimizing learning quality [16].

2.1 Operational Definition

In this study, quality of online learning or e-learning is defined as the degree to which instructors, students, the learning environment, and learning materials work together to create optimal learning processes and results in response to the curriculum [24]. While for the second construct namely motivation for learning (X1), it is defined as the full psychological drive that resides in a person and can inspire them to learn in order to meet the objectives of their studies in the university is known as learning motivation.

Next, the outcome expectation (X2) is known as the ability or outcome projection of the students, in this context is the tertiary level students. The three components that make outcome expectation load are (1) intrinsic outcome expectation load (also known as intrinsic outcome expectation load/IOEL), which is represented by students' capacity to take in and process information (MOEI); (2) extrinsic outcome expectation load (EOEL), which is characterized by students' mental effort (UM); and (3) constructive outcome expectation load (also known as German outcome expectation load/GOEL), which is represented by student learning outcomes [10].

Lastly, self-efficacy in students is described as the level of confidence that the students possess in their ability to accomplish activities in order to feel motivated, capable, and capable of handling any challenges that come their way [25]. In this situation, the tasks pertain to the academic sector. A study by [3] have stated the following indicators to describe one’s self-efficacy, namely, i) magnitude which is a measure of a person's self-assurance in their capacity to do the work at hand and their choice of behavior in response to challenges or the task's degree of difficulty, ii) generality, a measure of how each person feels about their capacity to complete tasks in a range of activities, and iii) strength, the degree to which personal expectations or convictions are strong.

2.2 Theoretical Framework and the Underpinning Theory

The framework for this study, which explains the connection between internal and external factors, is presented next. The study hypothesis, which states that there will be both a direct and an indirect influence due to intervening variables, is implicitly referenced in Figure 1 (Fig.1.). The conceptual framework for the research is as follows:

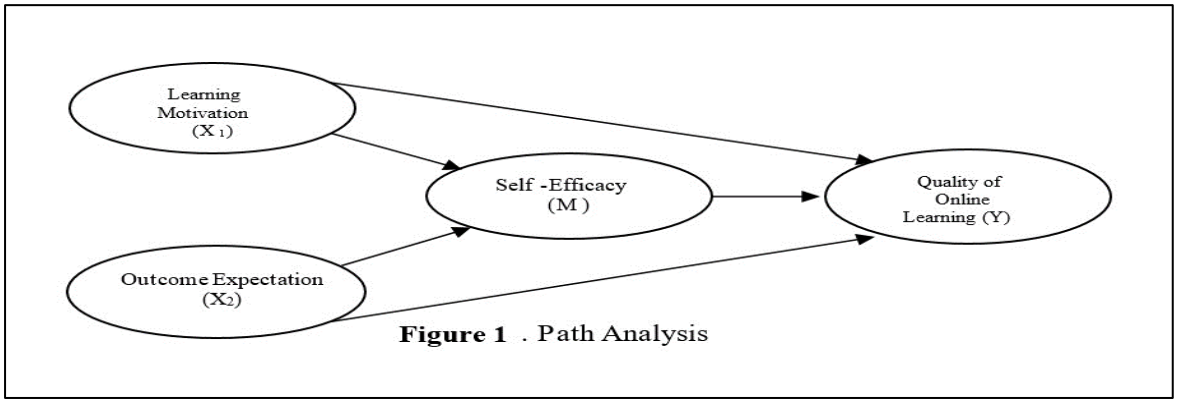


Fig. 1. Path Analysis

Based on the above-mentioned theoretical framework, the study's hypothesis pertains to the direct impact of learning motivation, output expectation ability, and self-efficacy on the situation of e-learning [16]. Similarly, the study and outcome expectations research hypothesis on self-efficacy can be used to express the direct influence. Additionally, learning and output expectation drive have an indirect impact on the quality of e-learning, which is mediated by self-efficacy [13].

Social cognitive theory is used to justify the relationship between the self-efficacy and the quality of e learning. [6] explained that an individual belief in ability to perform the specific task. E-learning students have higher Albert Bandura's Social Cognitive Theory is often used to justify the relationship between self-efficacy and the quality of e-learning [18].

According to [6] theory, people develop self-efficacy through social persuasion, observational learning, and personal experiences [8]. Positive experiences with task completion in an e-learning environment, exposure to role models that exhibit learning competency, and encouragement or feedback from instructors can all contribute to increased self-efficacy. The idea that students who believe they can learn and achieve in an online setting are more motivated to learn is the basis for the association between self-efficacy and the level of e-learning [31].

3. Research Methodology

In this study, a quantitative approach is employed using structured questionnaire survey in order to meet the set objectives. According to [19][20], questionnaire survey is among the most practical and commonly used tool to collect data in research. The quantitative research can be used to generalize research findings based on right sampling frame and size [9]. It is added that, for some studies, the generalize data (quantitative) used to complement qualitative data for mixed-method studies [1,21].

University of Engineering and Technology Taxila (UET) as one of the public HEIs was chosen as the study's subject since it is one of the first academic institutions in Islamabad to adopt remote recovery or e-learning. The study's participants were the among those students in the semester 2022–2023 of the university's academic calendar and they are those attended online lectures from various faculties (or schools). Eventually, there are 250 usable responses from the questionnaire survey collected and from there, the analysis is conducted accordingly. It is noteworthy to highlight that Google Forms is used to create an online questionnaire that is used for data collection. There are four constructs in this study: one external variable, online learning quality (Y), and three (two) internal variables, namely motivation to learn (X1), outcome expectation (X2), and self-efficacy (X3).

Using partial least square (PLS) analysis tools for data processing and testing. According to [1][20], PLS is a potent analytical technique since it relies on a few presumptions. PLS is the data analysis method used in this work, along with Smart PLS Software 4.0. The PLS approach has several benefits of its own, such as the ability to employ indicators with category, ordinal scale, intervals to ratios, and sample sizes that are not required to be huge, and the ability to use data that is not normally distributed multivariate. Though PLS-SEM is typically used to validate ideas.

4. Results and Findings

The purpose of this study's evaluation of the respondent profile was to identify the traits of Taxila (UET) students who participated in online learning. The descriptive (frequency) distribution as shown in Table 1 and 2 below of described gender and departmental divides respectively in this study.

Table 1
Descriptive (Frequency) Distribution - Gender

Description	Total population	Percentage (%)
Male	155	66
Female	95	34
Total	250	100.0

Table 2
Descriptive (Frequency) Distribution - Departmental

Department Data		
Faculty of Basic Sciences	65	26
Faculties Computer Science	62	24
Faculty of Engineering sciences	89	35
Faculty of Management sciences	34	17
Total	250	100.0

According to the frequency distribution test's overall results, 66 percent of students are male they study e-learning. While 34 percent of the remaining students are female. According to the data, there is a trend for the same proportion of male and female's students to participate in learning in this study. Furthermore, the Faculty of Basic Sciences and the Faculty of Computer Science each accounted for 26 percent and 24 percent of the total number of students who attended E-Learning, with the faculty of engineering for 89 percent of the total.

This accomplishment is a result of students' already strong learning motivation as well as their high levels of output expectation and self-efficacy. Accordingly, it has been determined that the overall evaluation of all study factors is adequate and of high learning quality. Smart PLS 3.0 (PLS-SEM) is used to evaluate complex and/or hypotheses in two steps model [20,22]. The outside model test is the first step, while the inner model test is the second. Examine the external model associated with the evaluation, gauging the degree of validity and dependability. The validity and reliability can be assessed of each statement item that makes up the research variable by testing the external model associated with the assessment test [20].

Conversely, the evaluation of the research hypothesis is connected to the inner model test. According to the outcomes of the external model test, all six statement items that make up the variable quality of e-learning and self-efficacy have good levels of validity. While learning motivation variables resulted in 12 question items with 4 invalid statements, self-efficacy variables resulted in 20 question items with 8 invalid statements. Path table and table findings for inner are the two

components that show how to test the inner model related to the evaluation of hypotheses [19][23]. These two outputs will clarify the relationship, both directly and indirectly, between exogenous variables and exogenous variables (learning motivation, output expectation, and self-efficacy) and the variable quality of learning e-learning [23]. Figure 2 (Fig. 2.) shows the PLS-SEM which appeared for this study;

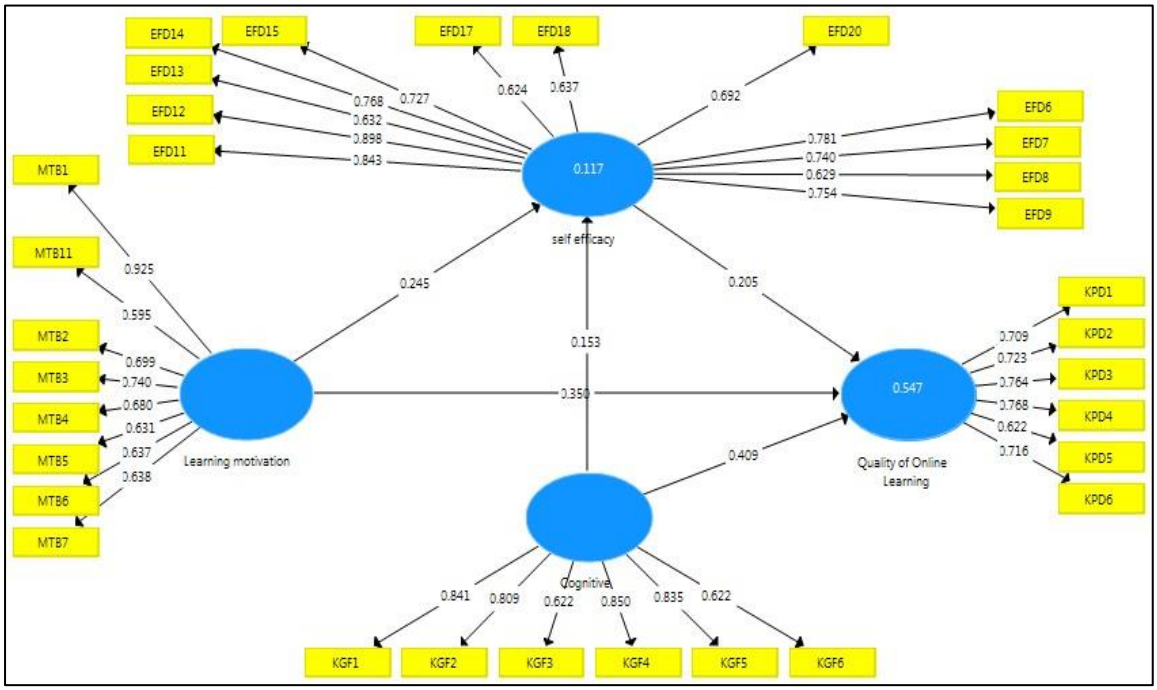


Fig. 2. Path Analysis

The Inner model's output comes next, from which we will evaluate the direct and indirect influence hypotheses using intervening variables. The outcome for inner weights is summarized in the table 3 as follows;

Table 3
Result For Inner Weights

Variables	Samples	Statistics	P Values	Hypothesis
LM-> QOL	0.351	5.519	0.000	Accepted
OE -> QOL	0.408	6.934	0.000	Accepted
LM ->SE	0.246	3.585	0.000	Accepted
OE -> SE	0.152	1.873	0.000	Accepted
SE -> QOL	0.204	3.364	0.001	Received
LM -> SE -> QOL	0.051	2.431	0.015	Accepted
OE-> SE -> QOL	0.031	1.516	0.000	Accepted

4.1 The Effect of Learning Motivation on the Quality of Learning E-Learning

The results for inner weights in the above table show that the alpha has a 0.05 small probability value, a 5.518 t value, a value P value, or a probability is 0.000, and a 0.35 regression coefficient. Thus, it can be said that University of Engineering and Technology Taxila (UET) students' E-Learning

quality is positively and significantly impacted by their learning motivation. In order for this theory to be deemed verified or accepted.

This suggests that a student's motivation to study plays a significant role in determining and facilitating high-quality e-learning experiences. Because the urge to learn might provide someone the strength to complete learning tasks. A study outlined by [27] provides support for this finding, stating that one of motivation's purposes is to establish the direction of activity, specifically toward the objectives to be reached, which are related to the learning quality.

Additionally, [10] noted that motivation is one of the characteristics that impacts the realization of the QOL and that influences the quality of learning. A study carried out by [12] indicates that there is a connection between the quality of online learning and learning motivation. The study by [4] which also discovered that learning motivation had a major impact on the caliber of e-learning, supports this conclusion.

4.2 The Effect of Outcome Expectations on the Quality of Instructional E-Learning

The examination of the data yielded an inner weight value of 0.408, a regression coefficient t value of 6.934, and a P value is 0000. In cases where the alpha value of 0.05 or 0.000 is less than 0.05. This research suggests that output expectation factors are significant in assessing the e-learning's quality for University of Engineering and Technology Taxila (UET) students. In order for this theory to be deemed verified or accepted as well.

The findings of the achievement level evaluation also point to the students' strong output expectation abilities and high standards of online education. This indicates that the quality of e-learning will have an impact on students' capacity to optimize their knowledge based on output expectations. According to [3], learning outcomes encompass behavioral modifications in the domains of emotional, psychomotor, and outcome expectations. Therefore, it may be concluded that output expectation elements play a significant role in determining how well an e-learning program is learned. According to research findings, learner-to-content (online) engagement and students' perceptions of their output expectations were highly correlated [7].

4.3 The Effect of Learning Motivation on Self-Efficacy

The data processing while using Smart PLS 4.0 also revealed that learning motivation in students in HEI's helps favorably and considerably to enhance self-efficacy. Where the regression coefficient is 0.24, the t count is 3.585, and the P value is 0.000. These findings suggest that learning motivation is a component that affects the self-efficacy for students are confidence in their ability to participate in e-learning. This indicates that students' self-efficacy and learning motivation represent their own personal power, which they can use to optimize the E-Learning process.

These findings further support the claim made by [7] claimed that self-efficacy plays a significant role in the process of self-regulation, or independence, by influencing the selection of goals and anticipated success levels. The hypothesis is aligned with the research conducted by [9], which found a substantial association between self-efficacy and learning motivation.

4.4 The Effect of Output Expectation on Self-Efficacy

Based on the result shown in Table 2, it is suggested that output expectation also has a noteworthy and good impact on students' self-efficacy with the university students. The value of the t count (t-value) is 1.874, the P-value is 0.062, and the regression coefficient is 0.15. In cases when

0.062 > 0.05 or the probability value is higher than alpha 0.05. This suggests that, at the level of error accepting data is 0.05, students' output expectation ability to raise their self-efficacy did significantly contribute to the results.

These findings also show that student confidence has increased as a result of the ongoing e-learning implementation. This occurs as a result of students' self-confidence being indirectly impacted by the conversion of traditional learning models to online models. This also has to do with how proficient and knowledgeable each student is in using various computers and the internet. The findings of the respondent's accomplishment level (TCR) evaluation on output expectation and student self-efficacy meet good or adequate requirements; however, the hypothesis assessment does not provide evidence that the current output expectation can fully impact student self-efficacy.

In order to maximize online learning, lecturers will need to cultivate students' self-efficacy in the future. The findings of this hypothesis are consistent with the findings of previous study [6], therefore, the relationship between these aforementioned variables should be seen as instrumental in developing positive or quality learning.

4.5 The Effect of Self-Efficacy on the Quality of E-Learning

E-Learning learning shows that self-efficacy has a favorable and noteworthy effect on the standard of e-learning learning. With a t count of 3.365, a regression coefficient value of 0.206, and a P value or probability of 0.001, the probability value is tiny at 0.05 or 0.001 < 0.05. Thus, it can be said that one significant element that also contributes to raising the standard of e-learning for University of Engineering and Technology Taxila (UET) students is self-efficacy. In order for this theory to be deemed verified or accepted.

However, the results of the respondent's level of achievement on students' self-efficacy regarding the caliber of e-learning were similarly encouraging and might help with e-learning adoption. This finding is consistent with the theory put forth by [7], who claimed that as self-efficacy can affect the selection of goals and expected standards of performance, it is a crucial component of the self-regulation process. Students' learning results and knowledge will both improve with their increased confidence, which will ultimately lead to greater learning quality. The study's findings are consistent with those of [2] who found that self-efficacy significantly affects how well e-learning is received.

4.6 The Effect of Learning Motivation on the Quality of E-Learning Through Self-Efficacy

This hypothesis seeks to determine how much self-efficacy factors influence learning motivation and, in turn, how well E-learning is executed. The findings pertaining to inner weights indicate that the self-efficacy variables have the capacity to enhance the impact of LM on the QOL for University of Engineering and Technology Taxila (UET) students. With a t count of 2.432, a regression coefficient of 0.050, and a P value is 0.015, the probability value is tiny between 0.05 and 0.015 < 0.05.

Thus, it can be said that students with strong learning motivation will have more confidence in their ability to raise the standard of their online education. Put another way, if students can certify that they have improved the caliber of their e-learning, the overall impact of learning motivation will be greater. In other words, we need to work on raising our own self-efficacy in addition to learning motivation.

4.7 The Effect of Output Expectation on the Quality of Learning Through Self-Efficacy

Lastly, the study's final hypothesis has an aim to evaluate the degree to which SE factors can output expectations and influence the improvement of e-learning quality. It is concluded that the variables of self-efficacy were unable to significantly improve output expectations influence in improving the quality of learning e-learning for students at University of Engineering and Technology Taxila (UET) on errors accepted data at 0.05. When the t count is 1.518, the regression coefficient is 0.031, and the P value, or probability, is 0.130, it indicates that the probability value is more than 0.05, or 0.130 > 0.05.

These findings show that in the empowering the knowledge it owned by students, the contribution offered to boost the self-efficacy appears to have been unable to significantly improve the quality of E learning. As previously said, students who do not all major in computer science have a diversity of competencies, which means that their degree of confidence will differ from that of students who study computer- or IT-based subjects.

5. Conclusion

It is concluded that, the study's findings indicated that the studied variables namely, learning desire, output expectation ability, and self-efficacy could be used to explain and assess the caliber of e-learning among tertiary level of studies. This is evident from the clear relationship between learning desire, output expectations, self-efficacy, and the caliber of e-learning. However, it also demonstrates how learning motivation and output expectations characteristics might account for how they affect self-efficacy.

The results of this study showed empirically that SE considering as mediating variable was only able to improve the influence of learning motivation in improving the quality of E-Learning, owing to indirect influences. Regarding the impact of output expectations on the caliber of learning, output expectations factors in e-learning do not appear to be able to fully optimize their contribution to raising the caliber of learning. As previously said, this has to do with the fact that the students included in this study's sample differed in their fields of study.

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References
[1] Abaidah, Tunku Nur Atikhah Binti Tunku, Muhamad Ali Imran Bin Kamarudin, and Nur Nadia Adjrina Binti Kamarruddin. "The Model of Entrepreneurial Marketing (EM) Among Agropreneurs in the Emerging Markets: A Conceptual Framework 1." *UCJC Business and Society Review* 80 (2024): 160-209.
[2] Aguilar, Stephen J. "A research-based approach for evaluating resources for transitioning to teaching online." *Information and Learning Sciences* 121, no. 5/6 (2020): 301-310. https://doi.org/10.1108/ILS-04-2020-0072
[3] Al Aroud, Bassam, Kamariah Yunus, and Hamzah Faleh Migdadi. "Yarmouk University EFL Undergraduate Students' Engagement with E-Learning Tools in Learning the English Language." *International Journal of Education, Psychology and Counselling (IJEPC)* 7 (2022): 431-440. https://doi.org/10.35631/IJEPC.747035
[4] Suharsimi, Arikunto. "Dasar-dasar Evaluasi Pendidikan (edisi revisi)." *Jakarta: Bumi Aksara* (2009).
[5] Artino, Anthony R. "Motivational beliefs and perceptions of instructional quality: Predicting satisfaction with online training." *Journal of computer assisted learning* 24, no. 3 (2008): 260-270. https://doi.org/10.1111/j.1365-2729.2007.00258.x
[6] Bandura, Albert. "The explanatory and predictive scope of self-efficacy theory." *Journal of social and clinical psychology* 4, no. 3 (1986): 359-373. https://doi.org/10.1521/jscp.1986.4.3.359

[7] Barbosa, Saulo Dubard, Megan W. Gerhardt, and Jill Richard Kickul. "The role of cognitive style and risk preference on entrepreneurial self-efficacy and entrepreneurial intentions." *Journal of Leadership & Organizational Studies* 13, no. 4 (2007): 86-104. https://doi.org/10.1177/10717919070130041001
[8] Baturay, Meltem Huri. "Relationships among sense of classroom community, perceived cognitive learning and satisfaction of students at an e-learning course." *Interactive Learning Environments* 19, no. 5 (2011): 563-575. https://doi.org/10.1080/10494821003644029
[9] Sekaran, Uma, and Roger Bougie. *Research methods for business: A skill building approach*. john wiley & sons, 2016.
[10] Domagk, Steffi, Ruth N. Schwartz, and Jan L. Plass. "Interactivity in multimedia learning: An integrated model." *Computers in Human Behavior* 26, no. 5 (2010): 1024-1033. https://doi.org/10.1016/j.chb.2010.03.003
[11] Dunkin, Michael J., and Bruce J. Biddle. *The study of teaching*. Holt, Rinehart & Winston, 1974.
[12] Faisal, Chaudhry Muhammad Nadeem, Daniel Fernandez-Lanvin, Javier De Andrés, and Martin Gonzalez-Rodriguez. "Design quality in building behavioral intention through affective and cognitive involvement for e-learning on smartphones." *Internet Research* 30, no. 6 (2020): 1631-1663. https://doi.org/10.1108/INTR-05-2019-0217
[13] Friedman, Howard S. "Kepribadian teori klasik dan riset modern edisi ketiga." (2020).
[14] Ghafur, Hanief. "Analysis of ICT development supporting the e-learning implementation on Nadhatul Ulama universities in Indonesia." *Journal of Social Studies Education Research* 12, no. 4 (2021): 121-143.
[15] Hapsari, Widya, Hari Wibawanto, and I. Made Sudana. "Pengembangan Mobile Learning Teknik Digital Bagi Mahasiswa Pendidikan Teknik Elektro." *Journal of Vocational and Career Education* 2, no. 1 (2017). https://doi.org/10.15294/jvce.v2i1.10979
[16] Hassankhani, Hadi, Alireza Mohajjel Aghdam, Azad Rahmani, and Zeynab Mohammadpoorfard. "The relationship between learning motivation and self efficacy among nursing students." *Research and Development in Medical Education* 4, no. 1 (2015): 97-101. https://doi.org/10.15171/rdme.2015.016
[17] Hong, Jon-Chao, Wei Cao, Xiaohong Liu, Kai-Hsin Tai, and Li Zhao. "Personality traits predict the effects of Internet and academic self-efficacy on practical performance anxiety in online learning under the COVID-19 lockdown." *Journal of Research on Technology in Education* 55, no. 3 (2023): 426-440. https://doi.org/10.1080/15391523.2021.1967818
[18] Horton, William, and Katherine Horton. *E-learning Tools and Technologies: A consumer's guide for trainers, teachers, educators, and instructional designers*. John Wiley & Sons, 2003.
[19] Kamarudin, M. A. I. "Entrepreneurial training in Malaysia–the mechanism and measurement: A case study." *Journal of Advanced Research in Dynamical and Control Systems* 11, no. 5 (2019): 505-510.
[20] Kamarudin, M. A. I., N. A. Afendi, M. Mohamad, and S. F. Sufahani. "Family-orientation training design in entrepreneurial training for family business small medium enterprises (SMEs): a measurement development." *Central Asia and The Caucasus* 22, no. 5 (2021): 317-332.
[21] Kamarudin, Muhamad Ali Imran, Nur Nadia Adjrina Kamarruddin, Azahari Ramli, and Safwan Marwin Abdul Murad. "The Challenges and Issues Faced by the New Appointed Academic Staffs of the University in the Emerging Market." *International Journal of Professional Business Review*8, no. 1 (2023): e01158-e01158. https://doi.org/10.26668/businessreview/2023.v8i1.1158
[22] Imran, Muhamad Ali, Maliani Mohamad, and Abdul Rahman. "DOES CONSULTATION PLAY IMPORTANT ROLES IN ENTREPRENEURIAL TRAINING PROGRAM?: A CONCEPTUAL FRAMEWORK FOR EMERGING MARKETS." *Russian Law Journal* 11, no. 4S (2023): 150-159. https://doi.org/10.52783/rlj.v11i4s.819
[23] Kamarudin, Muhamad Ali Imran, Norfarah Nordin, and Abdul Khalid Siti Nabiha. "Conceptualization of Entrepreneurial Training Model for Family Business SMEs in Malaysia." *Journal of Global Business and Social Entrepreneurship (GBSE)* 7, no. 22 (2021).
[24] Lee, Jay, Edzel Lapira, Behrad Bagheri, and Hung-an Kao. "Recent advances and trends in predictive manufacturing systems in big data environment." *Manufacturing letters* 1, no. 1 (2013): 38-41. https://doi.org/10.1016/j.mfglet.2013.09.005
[25] Mensah, Mavis SB, Keren NA Arthur, and Enoch Mensah-Williams. "Experiential learning in online entrepreneurship education: lessons from an undergraduate entrepreneurship course." In *Theorising Undergraduate entrepreneurship education: Reflections on the development of the entrepreneurial mindset*, pp. 333-351. Cham: Springer International Publishing, 2022. https://doi.org/10.1007/978-3-030-87865-8_18
[26] Putra, Ramdani Bayu, Muhammad Ridwan, Sitti Rizki Mulyani, Dharma Syahrullah Ekajaya, and Rio Andhika Putra. "Impact of learning motivation, cognitive and self-efficacy in improving learning quality e-learning in industrial era 4.0." In *Journal of Physics: Conference Series*, vol. 1339, no. 1, p. 012081. IOP Publishing, 2019. https://doi.org/10.1088/1742-6596/1339/1/012081
[27] Sardiman, A. M. "The Teaching of Social Studies in the Global Perspective." *The Journal of Social Studies Education* 1 (2012): 45-54.

[28] Shaaban, Safaa AM, and Rehab G. Rabie. "Acceptance of Technology and e-learning Among Undergraduate Business Students." *Journal of Systemics, Cybernetics and Informatics*20, no. 1 (2022): 334-350. https://doi.org/10.54808/JSCI.20.01.334

[29] Sitorus, Herna Valentina, Eko Wahyu Nugrahadi, and Kustoro Budiarta. "The effect of learning strategy and thinking ability on the students' learning outcomes in economics subject of xi social students in senior high school state 1 in pematang siantar." *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal* 2, no. 4 (2019): 451-460. https://doi.org/10.33258/birle.v2i4.543

[30] Stecuła, Kinga, and Radosław Wolniak. "Influence of COVID-19 pandemic on dissemination of innovative e-learning tools in higher education in Poland." *Journal of Open Innovation: Technology, Market, and Complexity* 8, no. 2 (2022): 89. https://doi.org/10.3390/joitmc8020089

[31] Wagiran, Wagiran, Suharjana Suharjana, Muhammad Nurtanto, and Farid Mutohhari. "Determining the e-learning readiness of higher education students: A study during the COVID-19 pandemic." *Heliyon* 8, no. 10 (2022). https://doi.org/10.1016/j.heliyon.2022.e11160