THE RELATIONSHIPS OF MOTIVATION FACTORS AND TECHNOLOGY USERS' ACCEPTANCE WITH ONLINE LEARNING EFFICIENCY DURING THE COVID-19 PANDEMIC SITUATION

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Abstract

This paper aims to examine the relationships of personal factors, motivation factors, perceived ease of use, and perceived usefulness with online learning efficiency during the COVID-19 pandemic situation. Firstly, an online questionnaire was used to collect data from the research sample consisting of 176 students obtained by using simple random sampling technique. The contents of the online questionnaires were to ascertain the influences of individual parameters such as gender, college years, and online learning equipment required for online education. Secondly, the data was analyzed with the use of descriptive statistics (frequency distribution, percentage, mean, and standard deviation). Then inferential statistics, namely, the t-test and F-test (one-way ANOVA) were used to determine group differences. Finally, Pearson correlation and stepwise multiple regression analysis were used to examine the relationships between variables to ascertain the factors affecting online learning performance. As a result, the perceived ease-of-use, responsibility, and benefit can predict online learning efficiency with the significance level of 0.05. The most predictable variables, in order, were the perceived ease-of-use (0.505), responsibility (0.244), and benefit (0.149), with a combined predictive power of 81.70%. Nevertheless, personal characteristics were shown to have little effect on online learning.

Keywords: Motivation, Technology User Acceptance, Online Learning

Introduction

During COVID-19, students were instructed in the comfort of their own homes. The epidemic has had an impact on the educational systems in every country that has been affected. A range of different regulations and tactics for coping with changes in the educational system have been implemented in various countries in response to this quandary (Aliyyah et al., 2020). There have been numerous instances of governments imposing indefinite lockdowns, which have included the complete

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closure of all educational institutions. Online learning will be the norm at all levels of school by the end of this decade. The advantage of online education is its flexibility in time and platform (Mukhtar et al., 2020). Through online education, students may work at their own pace and in the comfort of their own homes, customizing their learning to meet their specific needs and abilities. The bulk of learning courses place a greater emphasis on skill acquisition than on knowledge development. It is essential for students to gain skills and competencies through hands-on experience in the workplace, which is emphasized in the vocational school learning style (Syauqi et al., 2020). COVID-19 has had an impact on the traditional learning methods employed by academic institutions all around the world, including in the United States. Using instructional technology to mitigate the effects of the pandemic on educational activities has been highly beneficial (Adnan & Anwar, 2020). Online education is fundamentally focused on excellent planning and instructional materials that incorporate several theories and models that are now available. The lack of good planning, design, and development of online instructional programs in the face of the epidemic makes the transition from universities to online education more complicated (Adedoyin & Soykan, 2020). Because elementary school is taught online, most educators (73.9%) believe that Internet education is ineffective (Fauzi & Khusuma, 2020). To achieve learning objectives through online learning, a large number of resources and meticulous planning are required. An examination of online learning through the use of surveys is required in order to understand students' learning styles better. It is tremendously beneficial to have access to the Internet during a pandemic. Lecturers should use available resources, such as the free Messenger application, to enhance their teaching (Allo, 2020). The effectiveness of online learning is dependent on the content's ability to overcome and comprehend the difficulties encountered by students. The longevity of the COVID-19 pandemic could result in the formation of a new sort of society in the future, which would be beneficial to both instructors and students. Teachers must be able to assist students in expanding their knowledge and developing positive attitudes. Nevertheless, there are a slew of reasons in favor of e-learning that are worth considering. Accessibility, cost, flexibility, learning methodology, life-long learning, and policy are just a few of the advanced points. Blended learning is achieved by integrating face-to-face lectures with technological aids and resources (Dhawan, 2020). A study contrasted retrospective student reports of their experiences with traditional face-to-face learning against synchronous online learning, and the results were inconclusive. According to the student response pattern, the face-to-face format appears to be preferred over the synchronous online version. The current environment has induced increased negative moods (concern, aggravation, and boredom) and decreased pleasant emotions (joy, excitement, and happiness) (Besser et al., 2020). This study

aimed to investigate the elements that affect motivation, efficiency, user acceptance of technology, and online learning success during the COVID-19 pandemic. Because effective online education requires more than high-speed internet access and mobile devices, this study on student motivation and willingness to use technology must consider the online learning model. Additionally, this study shows which motivating elements have the most significant impact on technology adoption when aligning educational institutions with online learning and how these aspects should be leveraged to improve the curriculum and reward model for future online lectures.

Objectives

1. To study personal factors such as gender, college years, and online learning availability, which are required for online education when students learn online from home.

2. To study the association between motivation factors affecting online learning efficiency when students learn online from home.

3. To study the association between perceived ease of use and perceived usefulness that affects online learning efficiency when students learn online from home.

Literature Review

Frederick W. Taylor's Theoretical Concepts of Effective Management

Taylor advised the organization to establish a realistic management structure based on a scientific approach to teaching (Taylor, 1984). Thus, building a management theory requires a holistic approach incorporating experimental testing methodologies, processes, legislation, and work practices. The business would follow a set of employment standards. It must first do an observational analysis by observing, pacing, taking notes, analyzing, and examining thoroughly. Taylor established four scientific management concepts (Wren, 2011). To begin, establish a scientific approach to work as a standard of work. Additionally, Taylor's organizational concepts apply to all operations via collaboration and good working relationships inside the association (Taska, 2017).

Herzberg Theoretical Concept of Motivation Factor

The Motivation Factor refers to the intrinsic demands of a person that influence work happiness. It was revealed that the collected data from career prospects used the same questionnaire as Herzberg's (Wall & Stephenson, 1971) Interviews with potential employees Predictably, job searchers presented information via the prism of Herzberg's two-factor theoretical incentive attitude. They are replying to the identical set of queries that resulted in Herzberg's illogical conclusion. Additionally, a literature review on employee morale and commitment revealed that several studies have demonstrated that work influences employee engagement and efficiency (Demerouti et al., 2001). Personal development, job satisfaction, and achievement are all positively connected with employee participation and organizational participation.

Motivating elements contribute significantly to increased work productivity by motivating employees to engage in their jobs. As a result, it adds to job satisfaction, a factor associated explicitly with work that encourages individuals to enjoy and value their occupations (Jeung, 2011). Employee commitment improves because of professional advancement (Rich et al., 2010). It has been shown that positive interactions between employees and their bosses (Alok & Israel, 2012) or subordinates at work increase (Sobaih & Hasanein, 2020). On the other hand, excitement has a detrimental effect on workplace satisfaction and is a source of frustration, according to a literature review on motivational variables impacting online learning performance.

Technology Acceptance Theory

Since the early 1960s, the acceptability of new technology has been significantly enhanced by the advent of computers, according to Everett Rogers, a communication studies professor. He announced the theories of Diffusion of Innovation (DIT) and Social Transformation (SCT). As a result, that would determine whether innovation is accepted or rejected. When Fred Davis introduced DIT in 1985, he created the Technology Acceptance Model (TAM), which comprises independent and dependent elements (Davis, 1989). The technology acceptance theory has been applied to various social-psychological theories and technology acceptance models. According to the linked literature review conducted as part of this study, which includes the intelligent virtual agent, smartwatch (Lee et al., 2015), electronic payment (Daştan & Gürler, 2016), and technology user acceptance in the field of transportation and logistics (Tom Dieck et al., 2017). As a result, the external factors and belief variables are the most studied, with the Behavioral Intention to use (BI), attitude toward using (attitude), and Actual system Use (AU) factors following closely behind. Unfortunately, all of them fail to incorporate the application and integration of the information technology process, for example, the phase of utilizing technology, into their suggested business model.

Methodology

The data for this study was gathered using simple random sampling through online questionnaires. The questionnaire was distributed via the LINE application group in an online format. A LINE group utilizes the primary route of contact between the university and its students as a response. The Cronbach's alpha coefficient for this questionnaire was 0.949. Nakhon Phanom University has a total enrollment of 248 undergraduate students for the semester 1/2021. Taro Yamane's sampling size at a confidence level of 95% is 153 persons. Then the total sample size would be 183, with 20% allowance for dropout without replacement. While some of the crawl forms were incomplete, there were 176 people in the final dataset. Following that, the data was checked for accuracy and processed using the SPSS program, followed by presenting the study's findings and conceptual framework as Figure 1. 1) Descriptive statistics describe individual

factors using frequency distributions, percentages, means, and standard deviations. 2) Inferential statistics were utilized to analyze data linked with the technology acceptance model. Supporting and motivational variables were included. First, we will do a t-test for cases with two groups and an F-test (one-way ANOVA) for cases with more than two groups. Second, Pearson's Correlation Coefficient analyses are used to determine which factors are correlated. Finally, the relationship between all independent and dependent variables was analyzed using Stepwise Multiple Regression Analysis to determine factors affecting online learning performance.

Results

The researcher explored the "Relations Among Motivation and Technology User Acceptance to Online Learning Efficiency During the COVID-19 Pandemic Situation" The following details are obtained by splitting the study's findings and evaluating the data into tables 1, 2, 3, and 4.

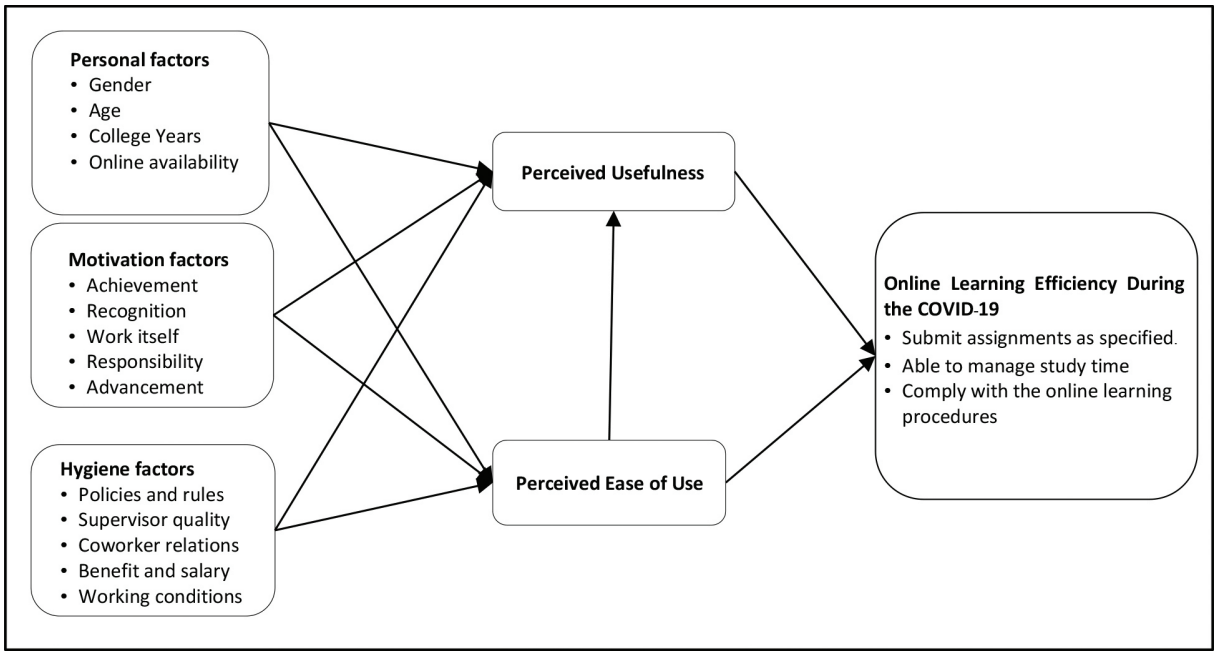

Figure 1 Conceptual Framework

Part 1 To study personal factors such as gender, college years, and online learning availability, which are required for online education when students learn online from home.

Table 1 The sampling characteristics and t-test, F-test (one-way ANOVA) analysis of personal factors

Personal factors	n	$\overline{X}$	S.D.
1. Gender			t = 1.509 Sig. = 0.720
Man	53	3.82	0.127
Women	123	3.59	0.081
Total	**176**		
2. College Years			F = 1.452 Sig. = 0.229
First-year	80	3.51	0.922
second-year	40	3.76	0.893
Third-year	33	3.78	0.942
Fourth-year	23	3.86	0.797
Total	**176**	**3.69**	**1.014**
3. Online learning availability			t = 2.569 Sig. = 0.111
Not ready	47	3.20	1.004
Ready	129	3.83	0.813
Total	**176**		

Significance Level: 0.05

Part 2 To study the relationship between motivation factors affecting online learning efficiency when students learn online from home.

Table 2 The Mean and Standard Deviation of each factor when students learn from home (Motivation factors and Technology acceptance factors)

Factors	n	$\overline{X}$	S.D.	Level
1. Hygiene factors				
1.1 Benefit	176	3.95	0.808	High
1.2 Policies and rules	176	3.82	0.878	High
1.3 Supervisor quality	176	3.78	0.860	Medium
1.4 Coworker relations	176	3.68	0.887	Medium
1.5 Working conditions	176	3.56	0.988	Medium
Total		**3.76**	**0.884**	**Medium**
2. Motivation factors				
2.1 Responsibility	176	3.77	0.818	Medium
2.2 Advancement	176	3.72	0.866	Medium
2.3 Work itself	176	3.71	0.877	Medium
2.4 Achievement	176	3.67	0.842	Medium
2.5 Recognition	176	3.60	0.933	Medium
Total		**3.69**	**0.867**	**Medium**
3. Technology acceptance factors				
3.1 Perceived ease-of-use	176	3.50	0.973	Medium
3.2 Perceived usefulness	176	3.38	1.008	Medium
Total		**3.57**	**0.991**	**Medium**

Part 3 To study the relationship between perceived ease of use and perceived usefulness that affects online learning efficiency when students learn online from home.

An analysis of the overall correlation of all independent and dependent variables was carried out using Stepwise Multiple Regression Analysis to investigate factors that influence online learning efficiency during the COVID-19 pandemic.

Table 3 Pearson correlation coefficients for each component when students learn from home

Factors	Pearson Correlation (r)	Sig. (2-tailed)
Benefit	0.647**	0.000
Policies and rules	0.639**	0.000
Coworker relations	0.734**	0.000
Working conditions	0.759**	0.000
Supervisor quality	0.720**	0.000
Achievement	0.772**	0.000
Recognition	0.655**	0.000
Work itself	0.752**	0.000
Responsibility	0.800**	0.000
Advancement	0.768**	0.000
Perceived usefulness	0.783**	0.000
Perceived ease-of-use	0.850**	0.000

** Correlation is significant at the 0.01 level (2-tailed)

Table 4 the stepwise multiple regression analysis for each component in regard to online education when students learn from home

Independent variable	B	S.E.	β	t	Sig.
(Constant)	-0.085	0.158		-0.536	0.592
Perceived ease-of-use	0.471	0.048	0.505	9.721	0.000
Responsibility	0.271	0.064	0.244	4.240	0.000
Benefit	0.167	0.050	0.149	3.338	0.001
R = 0.904, R^2 = 0.817, Std. Error of the Estimate = 0.393, Adjusted R Square = 0.813					

Stepwise (Criteria: Probability-of-F-to-enter < = .050)

As result, the following forecast equation can be stated in the form of raw scores and standard scores:

- The raw score is Y = 0.471 (Perceived ease-of-use) + 0.271 (Responsibility) + 0.167 (Benefit) - 0.085

- The standard score is Y = 0.505 (Perceived ease-of-use) + 0.244 (Responsibility) + 0.149 (Benefit)

The multiple correlation coefficient was 0.904 when all independent variables were included in the forecast equation, and the predictive power was 0.817.

Discussion and Conclusion

According to the research, the following three key areas of interest and discussion contribute to effective online learning.

First, this study discovered no association between the effectiveness of online learning and individual differences (gender, college years, and online availability). However, (Whitfield et al., 2021) identified personal factors that can be strengthened and developed over time that present practical tactics and ideas for harnessing and developing self-motivation to undertake the scholarly activity. There are associations with (Levine et al., 2021), which discovered that three distinct collaborative personality factors, trait agree-ableness, assisted autonomy striving, and secure parental attachment was associated with increases in autonomous motivation over an academic year. It may be because the sample group in this study consisted of individuals of similar ages and occupations. Also, before the COVID-19 pandemic, everyone possessed the essential technology and information technology capabilities to access the Internet. In conclusion, the findings from this study of personal factors may need to be compared to those from other variables.

Second, Benefits and responsibilities have been associated with learning online from home. There are hygiene factors that motivate students to go online and alleviate anxiety associated with shifting to online learning. Consistent with (Herlena et al., 2021) was discovered that individual performance was influenced by employee satisfaction with their compensation as compensation had significant implications for employees in terms of the reflection of the value of their work among employees. Responsibility is the internal requirement of individuals that affects job satisfaction and is classified as a motivation factor (Motivation Factor). This factor is closely tied to the work to drive people to like it and increase employee satisfaction to perform more efficiently. Meseguer-Sanchez et al. (2020) has defined responsibilities are commitments to complete tasks in conformity with the organization's objectives (García-Sánchez et al., 2020). Employees are expected to take ownership of the responsibilities entrusted to them by the business. In learning online situation, if the teacher has delegated job responsibilities to students, it is still accountable for the outcomes of that activity, such as broadening education (Wong et al., 2020) via video clips, papers, and research that can be accessed from anywhere via an internet system. Exam classes can be

arranged in various ways, depending on the circumstances, or allowing students to express their views. Also, Responsibilities toward educational institutions entail the student's participation in the educational institution's operations.

Third, Perceived ease-of-use has been supportive of learning online from home. The public perception was that following a prescribed approach would be simple (Caffaro et al., 2020) When something is difficult to operate or has a cumbersome user interface, it is often disliked. No matter where we operate, we can solve problems using information technology methods. Issues are inescapable. There are numerous options for resolving the issue according to the nature of the work, a single solution may not apply to another. The solution may or may not include information technology (Chen & Aklikokou, 2020). The solution may or may not include information technology. Adjusting the working style to accommodate the use of information technology is essential. Additionally, Li et al. (2020) an evaluation of the investment's worthiness must be conducted to avoid being a squandered investment.

Finally, there is an online learning solution suited for the setting, but it must manage and strike a balance between the original learning class's objective and ways to reduce student pressure. The instructor is responsible for preparing and supplying all relevant technology and equipment. Establish a daily schedule for online learning from home to enable students to manage their time correctly when studying online from home. Essential, a recording system is a must-have for new tools that will aid both teachers and students in enhancing online learning by allowing students to access materials at any time, even if their internet connection is down or unavailable.

Research Limitations

1. This research aims to study the relationships among motivation, performance, and technology user acceptance to online learning efficiency during the COVID-19 pandemic. Thus, to improve the accuracy of the research findings, future research may incorporate these aspects and those examined in this study further to analyze the mechanism of action on students' behavior and evaluate the differences between these processes.

2. This study used an online form tracking approach to collect data; it was not a longitudinal study in the strictest sense. In the future, three-stage follow-up surveys may be utilized to establish a causal relationship between variables.

3. Data source: This study employs a purposive sample technique and focuses exclusively on courses that have already shifted to online instruction. As a result, we may expand the scope of future studies by collecting samples from additional industries and places, yielding more compelling research findings.

References

Adedoyin, O. B., & Soykan, E. (2020). COVID-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments*. https://doi.org/10.1080/10494820.2020.1813180

Adnan, M., & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' Perspectives. *Journal of Pedagogical Sociology and Psychology, 2*(1), 45-51.

Aliyyah, R. R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M., & Tambunan, A. R. S. (2020). The perceptions of primary school teachers of online learning during the COVID-19 pandemic period: A case study in Indonesia. *Journal of Ethnic and Cultural Studies, 7*(2), 90-109.

Allo, M. D. G. (2020). Is the online learning good in the midst of COVID-19 Pandemic? The case of EFL learners. *Jurnal Sinestesia, 10*(1), 1-10.

Alok, K., & Israel, D. (2012). Authentic leadership & work engagement. *Indian Journal of Industrial Relations, 47*(3), 498-510.

Besser, A., Flett, G. L., & Zeigler-Hill, V. (2022). Adaptability to a sudden transition to online learning during the COVID-19 pandemic: Understanding the challenges for students. *Scholarship of Teaching and Learning in Psychology, 8*(2), 85-105. https://doi.org/10.1037/stl0000198

Caffaro, F., Cremasco, M. M., Roccato, M., & Cavallo, E. (2020). Drivers of farmers' intention to adopt technological innovations in Italy: The role of information sources, perceived usefulness, and perceived ease of use. *Journal of Rural Studies, 76*, 264-271.

Chen, L., & Aklikokou, A. K. (2020). Determinants of e-government adoption: Testing the mediating effects of perceived usefulness and perceived ease of use. *International Journal of Public Administration, 43*(10), 850-865.

Daştan, İ., & Gürler, C. (2016). Factors affecting the adoption of mobile payment systems: An empirical analysis. *Emerging Markets Journal (EMAJ), 6*(1), 17-24.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*(3), 499-512. https://doi.org/10.1037/0021-9010.86.3.499

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5-22.

Fauzi, I., & Khusuma, I. H. S. (2020). Teachers' elementary school in online learning of COVID-19 pandemic conditions. *Jurnal Iqra': Kajian Ilmu Pendidikan, 5*(1), 58-70.

García-Sánchez, I. M., Aibar-Guzmán, B., Aibar-Guzmán, C., & Azevedo, T. C. (2020). CEO ability and sustainability disclosures: The mediating effect of corporate social responsibility performance. *Corporate Social Responsibility and Environmental Management, 27*(4), 1565-1577.

Herlena, S. Z., Yogia, M. A., Rahman, K., Prayuda, R., & Munaf, Y. (2021). Analysis of the performance of state civil servants in the functional provision of salary in the department of education and culture Pelalawan District. *PalArch's Journal of Archaeology of Egypt/Egyptology, 18*(3), 303-321.

Jeung, C. W. (2011). The concept of employee engagement: A comprehensive review from a positive organizational behavior perspective. *Performance Improvement Quarterly, 24*(2), 49-69. https://doi.org/10.1002/piq.20110

Lee, J., Kwon, H., Seo, J., Shin, S., Koo, J. H., Pang, C., Son, S., Kim, J. H., Jang, Y. H., Kim, D. E., & Lee, T. (2015). Conductive fiber-based ultrasensitive textile pressure sensor for wearable electronics. *Advanced Materials, 27*(15), 2433-2439. https://doi.org/10.1002/adma.201500009

Levine, S. L., Milyavskaya, M., Powers, T. A., Holding, A. C., & Koestner, R. (2021). Autonomous motivation and support flourishes for individuals higher in collaborative personality factors: Agreeableness, assisted autonomy striving, and secure attachment. *Journal of Personality, 89*(5), 899-914. https://doi.org/10.1111/jopy.12622

Li, X., Zhao, X., & Pu, W. (2020). Measuring ease of use of mobile applications in e-commerce retailing from the perspective of consumer online shopping behavior patterns. *Journal of Retailing and Consumer Services, 55*, 102093.

Meseguer-Sanchez, V., Abad-Segura, E., Belmonte-Urena, L. J., & Molina-Moreno, V. (2020). Examining the Research Evolution on the Socio-Economic and Environmental Dimensions on University Social Responsibility. *International Journal of Environmental Research and Public Health, 17*(13), 4729. https://doi.org/10.3390/ijerph17134729

Mukhtar, K., Javed, K., Arooj, M., & Sethi, A. (2020). Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era. *Pakistan Journal of Medical Sciences, 36*(COVID19-S4), S27-S31. https://doi.org/10.12669/pjms.36.COVID19-S4.2785

Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. *Academy of Management Journal, 53*(3), 617-635.

Sobaih, A. E. E., & Hasanein, A. M. (2020). Herzberg's theory of motivation and job satisfaction: Does it work for hotel industry in developing countries? *Journal of Human Resources in Hospitality & Tourism, 19*(3), 1-25.

Syauqi, K., Munadi, S., & Triyono, M. B. (2020). Students' perceptions toward vocational education on online learning during the COVID-19 pandemic. *International Journal of Evaluation and Research in Education, 9*(4), 881-886.

Taska, L. (2017). *The oxford handbook of management*. Oxford University Press.

Taylor, F. W. (1984). *Critical studies in organization and bureaucracy*. Temple University Press.

Tom Dieck, M. C., Jung, T. H., Kim, W. G., & Moon, Y. (2017). Hotel guests' social media acceptance in luxury hotels. *International Journal of Contemporary Hospitality Management, 29*(1), 530-550. https://doi.org/10.1108/ijchm-10-2015-0552

Wall, T. D., & Stephenson, G. M. (1971). Ego-involvement and Herzberg's two-factor theory of job satisfaction: An experimental field study. *British Journal of Social and Clinical Psychology, 10*(2), 123-131. https://doi.org/10.1111/j.2044-8260.1971.tb00724.x

Whitfield, K. M., Dresser, J. D., Magoffin, R., & Wilby, K. J. (2021). Maintaining and maximizing motivation to progress scholarly work during challenging times-reflections from the pandemic. *Currents in Pharmacy Teaching and Learning, 13*(3), 193-197.

Wong, G. K., Ma, X., Dillenbourg, P., & Huan, J. (2020). Broadening artificial intelligence education in K-12: Where to start? *ACM Inroads, 11*(1), 20-29.

Wren, D. A. (2011). The centennial of Frederick W. Taylor's the principles of scientific management: A retrospective commentary. *Journal of Business & Management, 17*(1), 11-19.

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