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Online Motivation to Learn Affecting Undergraduate Students' Training Effectiveness: A Pre-Experiment of Smart Learning Program

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Abstract

Motivation to learn is found to be the most essential predictor for training effectiveness among employees in the organization. However, research reporting the effect of online motivation to learn on training effectiveness, especially using samples among undergraduate students, is limited. Hence, the purpose of this study is to determine the effect of online motivation to learn on training effectiveness using a pre-experimental design among 84 undergraduate students who attended an online training program named Smart Learning in Malaysia. Findings indicated that there was a significant increase in smart learning scores among participants as measured before and after the completion of online training, in which online motivation to learn had a moderate effect size and explained 37% variance in the training effectiveness. Findings are important for training providers to organize an online training program that could increase participants' online motivation to learn, especially among participants from undergraduate students. Additionally, future researchers are recommended to study factors affecting online motivation to learn among university students because it is proven to affect online training effectiveness.

Keywords: Online Training Program, Online Motivation to Learn, Training Effectiveness, Smart Learning, Undergraduate Students, Human Resource, Human Development, Malaysia

Introduction

Motivation to learn is found to be the precursor of training effectiveness in most employees' training programs (Mohamad et al., 2020; Saputra & Syaebani, 2024). Interestingly, previous researchers have proven that trainees who are motivated to learn in training is the reason that explains why some training is effective and some are not (Noe, 1986; Colquitt et al., 2000; Lathabhavan & Chidananda, 2024). Those research findings are important to understand the role of motivation to learn to improve employee training for future intervention.

However, despite a large number of researches that have proven the importance of motivation to learn in employee training, the effect of online motivation to learn on training

effectiveness has received little attention although the number of online training has increased (Aziz et al., 2024; Kulkarni et al., 2024). In fact, research related to the topic that involves training participants among students are very limited (Aziz et al., 2022); in which, most of previous researches only focus on online learning instead of online training (e.g., Elshareif & Mohamed, 2021; Zhang et al., 2025). Hence, the purpose of this study is to determine the effect of online motivation to learn on training effectiveness among undergraduate students who attended an online training. Findings are important to prove that motivation to learn is not only important in face-to-face training among employees in the organization but also among undergraduate students in online training. Additionally, future researchers are recommended to study factors affecting online motivation to learn among university students since training programs are not only offered among employees but also among undergraduate students.

Literature Review

According to Kirkpatrick and Kirkpatrick (2010) training effectiveness among employees can be evaluated by assessing the four levels including trainees' reaction to the positive effect of training, followed by learning improvement due to training, behavioural changes related to job performance, and the results or overall impact of training on organizational effectiveness. However, Kraiger et al. (1993) and Schick et al. (2024) argue that trainees' learning is the ultimate assessment to determine training effectiveness because the main reason for organizing training programs is to deliver learning among trainees. Consistently, Arthur et al. (2003) and Noe (2023) argue that trainees' learning in training should be able to achieve the training objective before a training can be said to be effective.

On the other hand, research related to training effectiveness among students is very limited because most previous researchers have focussed much on learning performance in formal educational programs among students (e.g., Elshareif & Mohamed, 2021; Zhang et al., 2025). However, nowadays, training programs are not only offered among employees but also among general citizens including undergraduate students (Boman, 2013; Richard et al., 2022; Muò et al., 2025). This is because undergraduate students also need to improve their knowledge, skills, attitude, and competencies that are not taught in formal education, such as leadership skills (Richard et al., 2022), communication skills (Muò et al., 2025), and teaching skills (Boman, 2013).

According to Kirkpatrick and Kirkpatrick (2010) and Noe (2023), trainees' learning acquisition can be determined by comparing the score between pre- and post-training evaluation related to the training objective; in which, the increase of scores show an improvement of learning due to the training program. Hence, online training among undergraduate students can be considered as effective if their learning scores increase. Therefore, it can be hypothesized that:

Ha1: There is a significant increase in scores of learning acquisition among undergraduate students after the completion of online training at 0.05 level of significance.

Further, motivation to learn is considered as the most important predictor for training effectiveness in employee training (e.g., Colquitt's et al., 2000; Chung et al., 2022). In fact, Chung et al. (2022) developed a framework to explain the effect of motivation to learn in

employees' training by revising Colquitt's et al. (2000) framework. Chung et al. (2022) argue that motivation to learn is not only the most important predictor of training effectiveness in face-to-face training but also in online training. Hence, this has demonstrated that motivation to learn can also be an influential predictor for online training among undergraduate students. Therefore, it can be hypothesized that:

Ha2: Online motivation to learn has a significant effect on online training effectiveness at 0.05 level of significance.

Furthermore, research to prove the effect of online motivation to learn on training effectiveness among students is very important for future research intervention (Aziz et al., 2022); hence it is also important among undergraduate students. This is because this kind of research can verify the importance of motivation to learn in online training in the digital era or so called 4IR; the 4IR is referred to "…the disruptive transformation of industries through the application of emerging technology; it is characterized by new technology that is fusing the physical, digital and biological worlds, impacting all disciplines, industries and the economy" (Economic Planning Unit, 2021). Towards the 4IR era, online training became familiar because of various benefits to be offered including distance learning, cost-saving, convenience, time saved, flexibility, and capacity to include many participants (Aziz et al., 2022). Hence, as similar as for online training among employees, research among undergraduate students can provide input to increase the effectiveness of online training among them as well as to inspire future research and intervention.

Methodology

To determine the effect of online motivation to learn on training effectiveness, a pre-experimental research was organized among 84 undergraduate students who attended an online training program in Malaysia named *Smart Learning* that was organized on 27th June 2023. The online training was organized by a secretariat of students registered with subject SKPM2093 at the National University of Malaysia's (Universiti Kebangsaan Malaysia/ UKM); in which, the program is registered with student activity portal named "i-star" with registration code C-SKPM2093-2023-83. This portal is prepared by the university to monitor students' activities in making sure that the activity organized by students is following guidelines, rules, ethics, and aligned with the university's goal. The online training was based on an open and voluntary participation, organized in a day, free of charge, and was advertised through social media. The program was also attended by undergraduate students from various higher learning institutions in Malaysia. These participants have also given their consent to participate voluntarily in the online training as well as to become the subject for pre-experimental research.

To measure online motivation to learn, the four items developed by Aziz and Selamat (2016) were used and adapted. Sample item was "I get excited to learn the contents of the online training that will be delivered during this training" (English version) or "*Saya rasa seronok untuk mempelajari isi kandungan latihan yang akan disampaikan sepanjang latihan ini*" (Malay version). The Alpha Cronbach reliability analysis shows that these four items had an acceptable value which was 0.876; according to Pallant (2020), the acceptable cut-off point is higher than 0.7. Meanwhile, to measure learning acquisition based on the objective to increase smart learning among participants, an instrument developed by Sung (2015) was

used and adapted using back-translation suggested by Behr (2017). Sample item was "I have the ability to carry out self-directed learning" (English version) or *"Saya mempunyai kebolehan untuk menjalankan pembelajaran kendiri terarah"* (Malay version). The Alpha Cronbach reliability analysis shows that these 12 items has acceptable value which was 0.955.

All questionnaires were asked using Google Form using dual-language English and Malay. The questionnaire measuring online motivation to learn was asked at the beginning of online training before it was started. Meanwhile, the questionnaire measuring smart leaning was asked two times; at the beginning of online training before it was started and right after the completion of online training. This procedure was organized as a pre-experimental study.

Data were then analysed using SPSS version 26 to test the research hypotheses. To determine the online training effectiveness, a paired sample t-test was used to compare participants' score of smart learning as measured before and after the completion of online training. Meanwhile, to determine the effect of motivation to learn on training effectiveness, a Linear Regression was used by analysing the influence of online motivation to learn (as independent variable) on smart learning acquisition (as dependent variable) as measured after the completion of online training. Additionally, independent sample t-test and one-way ANOVA were also used as additional analysis to make sure participants' demographic variables did not have significant effect on either online motivation to learn or training effectiveness.

Findings and Discussion

Preliminary analysis shows that data fall into parametric assumptions; in which, additional tests showed that participants' various demographic variables did not affect either online motivation to learn or training effectiveness. Overall, the main analysis indicated that all hypotheses were fully accepted. Findings indicated a significant increase of smart learning acquisition after the completion of online training demonstrating the online training effectiveness. Additionally, online motivation to learn had a significant effect on the training effectiveness.

Participants' various demographic variables are shown in Table 1. Majority of respondents were females (62.7%), aged 22 years old (36.1%), Malay race (68%), Islam religion (70%), came from background with family income more than RM4000 per month (41%), have not attended similar training before (62.7%), and have not attended online training before (86.7%). These can be seen as the profile of participants (trainees) that are interested in smart learning training. To make sure that these variables had no effect either on online motivation to learn or training effectiveness, an independent sample t-test was done for participants' gender, and whether they have attended similar training or attended online training before; findings indicated no significant difference between these groups. Additionally, one-way ANOVA were tested to make sure several demographic variables including age, race, religion, and family income did not have significant effect either on online training motivation or online training effectiveness. Findings also indicated that these demographic variables had no significant difference in various demographic groups. However, the results are not shown because they were not part of research objectives or hypotheses.

Table 1
Demographic Variables of Participants

Demographic	Group	Frequency	Percentage (%)
Gender	Male	15	37.3
	Female	68	62.7
		83	100
Age	20	15	18.1
	21	27	32.5
	22	30	36.1
	23	7	8.4
	24	4	4.8
		83	100
Race	Malay	68	81.9
	Chinese	6	7.2
	Indian	6	7.2
	Other	3	3.6
		83	100
Religion	Islam	70	84.3
	Christian	1	1.2
	Hindu	6	7.2
	Buddha	6	7.2
		83	100
Family Income	Less than RM2000	25	30.1
	RM2000 to RM4000	24	28.9
	More than RM4000	34	41
		83	100
Attended similar training before	Yes	31	37.3
	No	52	62.7
		83	100
Attended online training before	Yes	72	86.7
	No	11	13.3
		83	100

Further, both Table 2 and Table 3 show the results of a paired sample t-test to determine training effectiveness by comparing participants' smart learning scores as measured before and after the completion of online training. Findings indicated that there was a significant increase of participants' scores of pre-smart learning as measured before (M = 6.775, SD = 1.679) and in post-smart learning as measured after (M = 8.606, SD = 1.143) the completion of online training. Meanwhile, Figure 1 shows the increase of mean score of participants' smart learning from pre- to post-measurement demonstrating the effectiveness of online training. Hence, hypothesis Ha1 is accepted.

Findings are consistent with previous research related to employees' training effectiveness including those by Kraiger et al. (1993) and Schick et al. (2024), wherein participants' learning in training was increased after the completion of training thus demonstrating the training effectiveness. Therefore, it can be concluded that online training will also increase participants' learning among undergraduate students' samples. However, research related to

online training among undergraduate students is still limited; hence, future research is suggested to investigate factors affecting effective online training among undergraduate students.

Table 2
Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post-Smart Learning Scores	8.606	83	1.143	.125
	Pre-Smart Learning Scores	6.775	83	1.679	.184

Table 3
Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1 Post -Pre (Smart Learning Scores)	1.831	1.383	.1518	1.529	2.133	12.065	82	.000

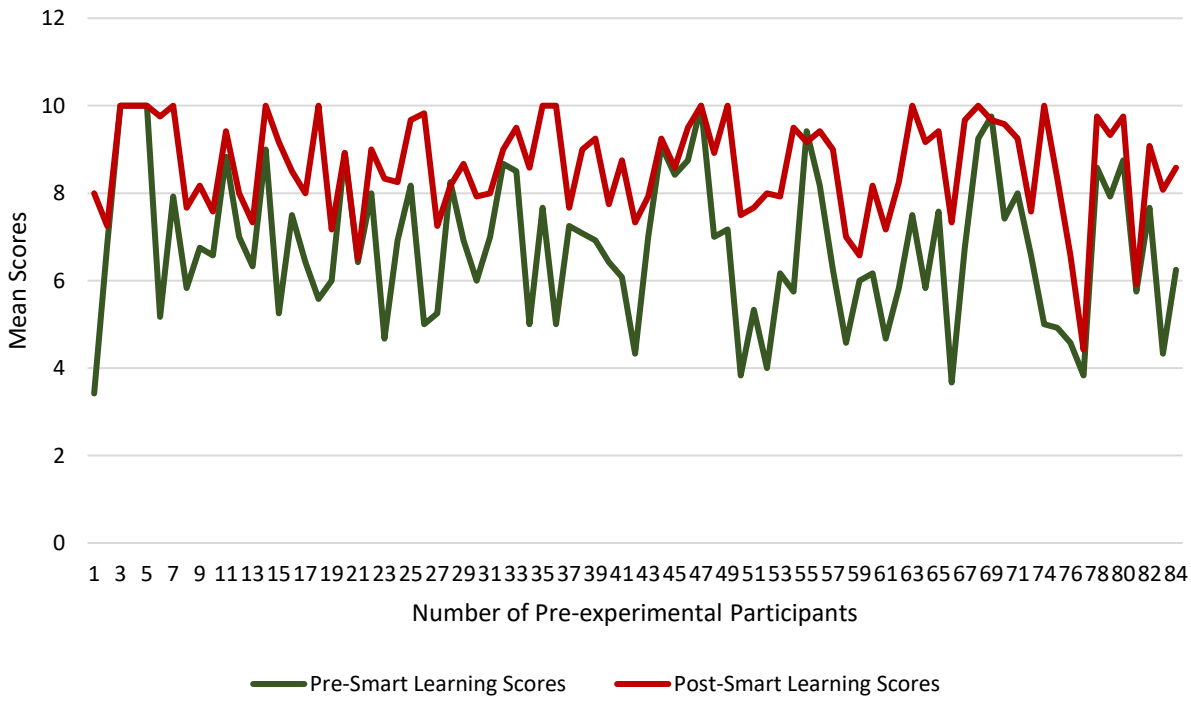

Figure 1: Mean scores of participants' smart learning scores as measured before and after online training completion

Further, Table 4, Table 5, and Table 6 show the results of linear regression to determine the effect of online motivation to learn on training effectiveness; in which, the score of post-smart learning acquisition was taken as online training effectiveness. Findings indicated that online motivation to learn had a significant effect on training effectiveness ($\beta = 0.614$, $p = 0.000$); in which, according to Ferguson (2009), the effect is moderate. Additionally, online motivation to learn also explained 37% of variance in online training effectiveness ($R^2 = 0.370$, $p = 0.000$). Hence, hypothesis Ha2 is also accepted.

Findings are consistent with those previous researchers that found significant effect of motivation to learn on training effectiveness in employee training (e.g., Colquitt's et al., 2000; Chung et al., 2022). However, the current research found that online motivation to learn also had an effect on training effectiveness among undergraduate students. Hence, future researchers should investigate factors affecting online motivation to learn and training effectiveness among undergraduate students.

Table 4
Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.614[a]	.377	.370	.96437	2.331

a. Predictors: (Constant), Online Motivation to Learn
b. Dependent Variable: Post-Smart Learning Acquisition (Online Training Effectiveness)

Table 5
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	45.642	1	45.642	49.077	.000[b]
	Residual	75.331	81	.930		
	Total	120.973	82			

a. Dependent Variable: Post-Smart Learning Acquisition (Online Training Effectiveness)
b. Predictors: (Constant), Online Motivation to Learn

Table 6
Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	2.899	.809		3.583	.001		
	Online Motivation to Learn	.653	.093	.614	7.005	.000	1.000	1.000

a. Dependent Variable: Post-Smart Learning Acquisition (Online Training Effectiveness)

Conclusion

In conclusion, the purpose of this article was to to determine the effect of online motivation to learn on training effectiveness using a pre-experimental design among 84 undergraduate students who attended an online training program named Smart Learning in Malaysia. Using a paired sample t-test, findings indicated a significant increase of post- smart learning scores indicating the effectiveness of online training. In addition, online motivation to learn had moderate effect size and explains 37% variance in training effectiveness. This has proven that online motivation to learn also has an influential effect on online training effectiveness as consistent as in most employee training programs. Findings are important to stimulate training providers to organize online training programs that can increase participants' motivation to learn. Additionally, future researchers are recommended to study factors affecting online motivation to learn that can subsequently increase training effectiveness for future research and intervention.

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