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Satisfaction with Online Distance Learning: Evaluating the Attention, Relevance, Confidence, and Satisfaction (ARCS) Model

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ABSTRACT
COVID-19 has turned Malaysia's educational setting at all levels from conventional classrooms to a full-fledged online distance learning (ODL) environment. Thus, examining student satisfaction with the ODL post-pandemic is crucial and needs to be examined. By applying the Attention, Relevance, Confidence, and Satisfaction (ARCS) motivation model, this study aimed to explore how attention, relevance, and confidence can predict student satisfaction with online learning. Employing convenience sampling, the data were collected from undergraduate students of the Universiti Teknologi MARA (UiTM) Seremban 3 Campus, Malaysia. Based on Krejcie and Morgan's (1970) table for determining sample size for a given population (N=5000), 381 samples were selected, and a final valid of 268 students participated in this study. Correlational results have proved that all independent variables were significantly influencing student satisfaction. The study also found that relevance emerged as a significant predictor of student satisfaction with online learning. This study suggests that universities and educators must employ strategies to enhance students' online learning satisfaction. This research is essential since it provides evaluation results to the universities, which the results could be used to promote higher-quality learning and education.

Keywords: attention; relevance; confidence; satisfaction; online distance learning (ODL)

INTRODUCTION

The coronavirus (COVID-19) outbreak has impacted the Malaysian learning system from the primary to the tertiary level. The learning system in Malaysia has changed from a traditional approach to online distance learning (ODL). ODL is virtual learning and is implemented using the Internet and technologies such as computers, laptops, notebooks, tablets, smartphones, and others (Crow & Murray, 2020). The effectiveness of ODL heavily depends on the high capabilities of

Internet connectivity. The online learning system is not new to most universities in Malaysia since the universities and educators have been exposed to Massive Open Online Courses (MOOCs). In October 2014, the Malaysian Ministry of Higher Education announced to implementation of MOOCs for all public universities. In September 2014, four courses from public universities started a MOOCs pilot project. These courses include 1) Islamic and Asian Civilisations (Universiti Putra Malaysia), 2) Ethnic Relations (Universiti Kebangsaan Malaysia), 3) Entrepreneurship (Universiti Teknologi MARA), and 4) ICT Competence (Universiti Malaysia Sarawak) (Nordin et al., 2019). Furthermore, many universities such as Open University, Universiti Teknologi MARA (UiTM), Universiti Malaya (UM), and others have implemented the ODL approach for their part-time students, which the students able to attend lectures after working hours. This online learning is beneficial and needed for those who have full-time jobs (Wong et al., 2019).

However, not all educators are ready for the transition. Many studies have recognized that the transition is being done in a forceful way, and most educators have stress managing the ODL (Dhawan, 2020; Rieley, 2020). These problems also could affect student satisfaction. Many educators and learners face difficulties such as downloading and installation errors and problems. Students also find online teaching dreary, with too much theoretical focus, and needing two-way communication (Kebritchi et al., 2017). Both educators and students are also found to be poorly prepared for the ODL (Affouneh et al., 2020). The success of ODL depends on three essential elements: educators, students, and technology (Au et al., 2018). Empirical studies have discovered that the effectiveness of ODL can be understood by evaluating student satisfaction in online learning (Landrum et al., 2020). Learning satisfaction is also the most critical indicator in determining the success of online learning, and it is mainly determined by user perceptions of the usability and quality of courses, the quality of website platforms and services, and the level of achievement expected (Pham et al., 2019; Roque-Hernández et al., 2021). Learning satisfaction needs to be understood because some online learning has failed to meet student needs and does not achieve the learning objectives as expected (Landrum et al., 2020). Empirical studies also have found that online learning significantly leads to academic achievements (Abdous, 2019; Yilmaz, 2017). For instance, Alamri's (2019) study discovered that students' satisfaction with flipped classrooms influences academic achievement. In addition, teaching material, interactive discussion, and the instructor’s role were essential elements in establishing high-quality learning.

Keller (1987) developed the Attention, Relevance, Confidence, and Satisfaction (ARCS) Motivation Model that incorporates strategies to improve student motivation (as cited in Fırat, Kılınç, & Yüzer, 2017). The first strategy is capturing student attention, in which delivery strategies must capture student interest and motivation, such as using infographics, game techniques, flipped classrooms, and others. For instance, infographics help raise student attention and improve learning delivery (Chicca & Chunta, 2020). Second is relevance, in which the content of e-learning must be relevant to the learners, such as related to assessment marks, final examination requirements, or future work employment. The third factor is confidence, meaning the students must be highly confident and understand the online learning system. Finally, student satisfaction is fulfilled once all elements have been met. As a result, student satisfaction will determine student motivation with e-learning.

Undoubtedly, online learning is trending and increasing importance after the post-

pandemic, even though some research shows its limitations. There have been many studies on students, yet student satisfaction with the ODL after post-pandemic is rarely examined. Adopting online learning during the pandemic of COVID-19 is stressful for both lecturers and learners; therefore, understanding how students perceive this transition is essential. This research is unique since it enriches the previous empirical studies by carrying out the study among undergraduate students during the implementation of ODL in the new normal. This research is essential since it provides evaluation results to the universities, which could be used to promote higher-quality learning and education. Therefore, this study aims to examine the determinants of online learning satisfaction during COVID-19.

LITERATURE REVIEW

Attention–Relevance–Confidence–Satisfaction (ARCS) Theory

Keller (1987) proposed the Attention–Relevance–Confidence–Satisfaction (ARCS) model, which provides a framework to identify student learning effectiveness. ARCS emphasizes that learners' motivation must be matched by using these four factors. First, attention refers to the ability of educators to respond to and manage students' sensation-seeking needs and knowledge curiosity (Keller, 1987). According to Young et al. (2009), attention refers to "a spotlight, with a variable focus, which can be narrowed and intensified, or broadened and dissipated, as task conditions demand" (p. 290). Empirical studies have found that learning is only effective if the students can give their full attention (Biwer et al., 2021).

In examining the validity of 10 minutes focus, Rosengrant, Hearrington, and O'Brien's (2021) result revealed that a well-structured online class could improve student attention more than the first 10 minutes. There are some strategies for raising students' attention. For instance, introduce two equal statements in which only one can be true. Thus, students could boost their attention and interest in the topic given. Second, the educators can show interactive infographics on the topic. The third is by intensifying the usage of learning materials and media (Chandra & Bagdi, 2021; Wang & Antonenko, 2017). Fourth is by changing teacher-oriented classrooms into the student-oriented classroom. Finally, the educators could pose provocation questions and problem-solving brainstorming. In addition, the educators are encouraged to demonstrate the usage of software or platform when implementing ODL, and the educators also could set up communication opportunities such as chat, whatapps groups, telegram groups, or discussion boards where the students could interact with their lecturers and peers (Singh & Thurman, 2019).

The second factor is relevance which posits that the learning contents need to be related to the learners' experiences (Keller, 2010). The learning content must be relevant in that the students can see how it could benefit them in real life. Thus, the learning material must be relevant to student's interests and goals. Educators must inform students about the benefits of learning a particular subject for their future. Scholars in psychology research suggest that student demographic backgrounds should be adapted to the current education system (Bridgeland, Dilulio, & Balfanz, 2009). Li and Tsai (2017) also found that students are likely to focus on viewing learning materials related to their classroom lectures compared to other learning materials. As highlighted by The National Research Council's Committee on Increasing High School Students' Engagement and Motivation to Learn (NRC, 2003), "the instructional program needs to be relevant

to and build on students' cultural backgrounds and personal experiences, and provide opportunities for students to engage in authentic tasks that have meaning in the world outside of school" (p. 94). Moreover, as the unemployment rate is increasing during the COVID-19 pandemic era, some scholars stressed the importance of merging educational content with career preparation (Eagan et al., 2017). Therefore, learning content's relevancy helps promote learning motivation (Somers & Llinares, 2021).

The third element is confidence, where the students are engaged by establishing positive expectations for success (Keller, 2010). This means that the students can self-direct themselves to use the online learning platform. If students have high self-confidence, it will support the development of appropriate knowledge, competencies, and skills (Letcher & Neves, 2010). To achieve this, Hew et al.'s (2020) study suggest the significant roles of instructors, assessment techniques, and flexible schedules. According to Technology Acceptance Model (TAM), students must be able to use the technologies to enhance student satisfaction. Huang's (2021) study, for instance, has found both perceived ease and usefulness significantly influence learning motivation. Similarly, Nikou and Economides (2017) also found that the ease of usage of a mobile system helps improve learners' intention to use a mobile evaluation system.

Concerning MOOC contexts, Wu and Chen's (2017) study also found that ease of use significantly affected the learners learning application and experience. Thus, students need to believe that using technology is effortless and that individuals can engage quickly. If a new technology is perceived to be challenging to use, users will likely explore other alternatives or stay with a conventional classroom format (Teo, 2019). In evaluating the adoption of e-books, Salloum and Shaalan's (2018) findings indicate that computer self-efficacy, confirmation, innovativeness, and subjective norm positively influence perceived ease of use. Ashtari and Eydgahi (2017) discovered a significant relationship between the ability to handle technology and cloud-based applications' effectiveness. Moreover, they also found that computer anxiety hinders the inclination to use cloud-based applications. Therefore, students' readiness and confidence are significant predictors of learning satisfaction and motivation (Salloum & Shaalan, 2018; Yilmaz, 2017).

Learning Satisfaction

Satisfaction can be defined as the feeling of being happy or disappointed. Learning satisfaction refers to the perceived value students experience from the learning session (Jiang et al., 2021). Learning satisfaction can be measured based on the student's feeling, enjoyment, and excitement of learning (Bervell et al., 2019). Learning satisfaction is also subjective since the different student has different backgrounds and needs, which affect the learning process assessment. Online learning satisfaction may be determined by communication, engagement, flexibility, workload, technology support, pedagogical skills, and feedback (Nikou & Economides, 2017; Chandra & Bagdi, 2021; Wang & Antonenko, 2017). Online learning satisfaction includes several essential elements, such as learning goals, performance assessment and measurement, teaching resources, communication flow, and learning platforms and methodologies. These elements can determine the level of learning satisfaction (Yilmaz, 2017; Chandra & Bagdi, 2021; Wang & Antonenko, 2017). For instance, a lack of teaching material and minimum communication between lecturers and students leads to higher learning satisfaction. Furthermore, several studies have associated the influence of online learning satisfaction and student performance (Chandra & Bagdi, 2021; Wang

& Antonenko, 2017; Singh & Thurman, 2019). For instance, Wei and Chou (2020) have found that online learning satisfaction influences student academic achievement. In addition, Nagy's (2018) results confirmed that technology relevancy, human action and behaviour, and capability to organize and execute action directly affected the intention to use online video. As a result, learning satisfaction is directly influenced learning performance. Prior studies also have demonstrated the critical effect of satisfaction with the retention to use the technologies (Hoehle et al., 2011). Therefore, this study proposes the following hypothesis:

H1: There is a significant relationship between attention and student online learning satisfaction of the Universiti Teknologi MARA (UiTM) Seremban students.

H2: There is a significant relationship between relevance and student online learning satisfaction of the Universiti Teknologi MARA (UiTM) Seremban students.

H3: There is a significant relationship between confidence and student online learning satisfaction of the Universiti Teknologi MARA (UiTM) Seremban students.

CONCEPTUAL FRAMEWORK

Figure 1 represents the conceptual framework that highlights the factors influencing student online learning satisfaction.

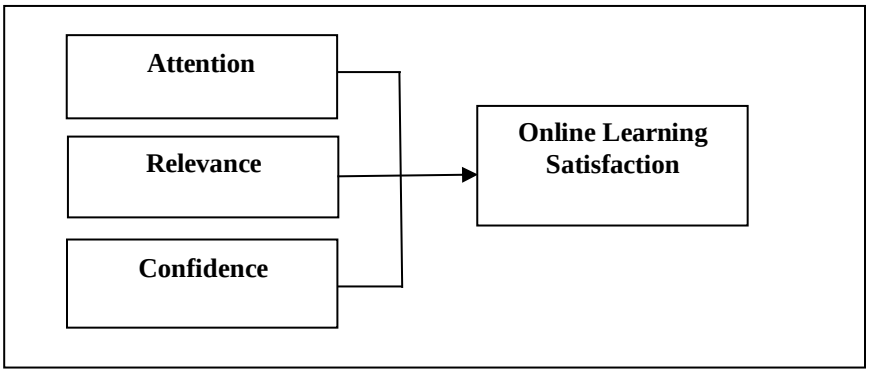

Figure 1. Conceptual framework on the factors that influence student online learning satisfaction

METHODOLOGY

A cross-sectional design using the quantitative method and a non-probability convenience sampling was used in this study. Following the Krejcie and Morgan Table of 1970, the sample of 381 students was defined for data collection (N=5000). Usable questionnaires were received from 268 respondents, representing a response rate of 70.3%. Table 1 summarizes the profile of respondents collected in this study. Among the 268 respondents involved in this study, 211 were female (78.7%), and 57 were male (21.3%). Then, most of the respondents obtained a current GPA of 3.00-3.49 (n=185, 69.0%). Then, most respondents admitted that they were facing Internet connectivity difficulties (n=162, 60.4%).

Table 1.
Demographic Profile

No.	Profile	Frequency (n)	Percentage (%)
1	Gender		
	Male	57	21.3
	Female	211	78.7
2	GPA		
	<3.00	50	18.7
	3.00-3.49	185	69.0
	3.50 and above	33	12.3
3	Internet Connectivity		
	Difficulties	162	60.4
	Yes	106	39.6
	No		

All variables are adapted from an original 36-item scale by Keller (2010) consisting of four subscales (i.e., attention, relevance, confidence, and satisfaction). All dimensions for each variable used the Likert Scale to examine how strongly respondents agree or disagree with statements on a five-point scale. Table 2 summarizes the details of the measurement.

Table 2.
Details of Measurement

Variable	Question
Attention	1) The quality of the online platform helped to hold my attention.
	2) The way the information is arranged on the platform helped keep my attention.
	3) The variety of reading passages, exercises, illustrations, materials, and others helped keep my attention on online learning.
Relevance	1) Online learning will be helpful to me.
	2) Online learning is worth it to me.
Confidence	1) As I learned through online learning, I was confident I could learn how to use it.
	2) After I learned through online learning for a while, I was confident that I would be able to complete exercises with an online platform.
	3) The excellent organization of the content helped me be confident that I would learn via an online platform.
Online Learning Satisfaction	1) I enjoyed learning with an online platform so much that I was stimulated to keep on learning.
	2) I enjoyed online learning.
	3) It was a pleasure to learn via an online platform.

Before the primary data analysis, data were checked for reliability and normality assumptions. Cronbach's alpha is used to test for the internal consistency of measures. A reliability value less than 0.60 is poor, 0.60 to 0.70 is moderate, 0.70 to 0.80 is good, 0.80 to 0.90 is exceptionally good, and 0.90 is excellent (Sekaran & Bougie, 2016). To test the normality of the data, Kline (2005) stated that the skewness value should fall within the range of -3 to +3, and the kurtosis value should fall within the range of -10 to +10 to indicate the standard distributions. The Pearson correlation coefficient was used before the goodness of measure to establish the relationship between predictor and criterion variables.

FINDINGS

Table 3.
Normality and Reliability Results

Variable	Mean	SD	Skewness	Kurtosis	Cronbach's Alpha
Independent Variable:					
Attention	3.64	0.79	-0.41	-0.07	0.81
Relevance	3.34	0.96	-0.20	-0.57	0.91
Confidence	3.70	0.77	-0.39	0.19	0.83
Dependent Variable:					
Online Learning Satisfaction	3.23	1.01	-0.12	-0.67	0.91

Descriptive analysis was performed to examine the variables' mean (M) and standard deviation (SD). Most scores are above the midpoint of 2.5, between 3.23 and 3.70 (refer to Table 3). These results indicate the overall positive response to the study. Based on Table 3, skewness values fall within the range of -3 to +3, and the kurtosis values fall within the range of -10 to +10 Thus, the research model is stated to have met the assumption of normality and can be continued with other classical assumption tests. Cronbach's Alpha value for attention (0.81), relevance (0.91), confidence (0.83), and Online Learning Satisfaction (0.91) are above 0.60, which indicates good reliability.

Table 4.
Correlation Results

Variable		Result	Hypotheses
Attention	Pearson Correlation	0.551**	H1 accepted
	Sig. (1-tailed)	0.000	
	N	268	
Relevance	Pearson Correlation	0.732**	H2 accepted
	Sig. (1-tailed)	0.000	
	N	268	
Confidence	Pearson Correlation	0.705**	H3 accepted
	Sig. (1-tailed)	0.000	
	N	268	

Table 4 shows a positive relationship between attention and online learning satisfaction (r= 0.551**, p=0.000, $p < 0.05$). Then, there is a positive relationship between relevance and online learning satisfaction (r= 0.732**, p=0.146, $p < 0.05$). Finally, there is a positive relationship between confidence and online learning satisfaction (r=0.705**, p=0.000, $p < 0.05$). Therefore, H1, H2, and H3 were accepted.

Table 5.
Regression Results

Variable	Beta *(β)*	Sig. *(p)*	Tolerance	VIF
Attention	0.14	0.004	0.64	1.57
Relevance	0.40	0.000	0.45	2.21
Confidence	0.37	0.000	0.55	1.83
R^2	0.632			
Adjusted R^2	0.628			
F Change	151.08			
Sig	0.000			

Based on the Table 5, it is shown that the result of the calculation of the Tolerance value shows that there is no independent variable that has a Tolerance value of less than 0.10, besides that, the result of the calculation of the Variance InflationFactor (VIF) value also shows the same thing that there is no independent variable that has a VIF value of more than 10. So it can be concluded that there is no element of multicollinearity between independent variables in the regression model. Then, regression analysis showed that attention, relevance, and confidence significantly predicted online learning satisfaction with an adjusted R^2 value of 62.8%. The ANOVA generated in this test also shows a significant probability value (p=0.000) and signifies that all the factors of attention, relevance, and confidence significantly affect online learning satisfaction. Table 5 also shows a high beta value which depicts that relevance (β=0.40, p=0.000)

explains a high degree of online learning satisfaction. It shows that ensuring the relevance of ODL is essential and positively impacts online learning satisfaction.

DISCUSSION

Previous studies have extensively examined the determinants of online learning effectiveness, and this study aims to offer new insight into the current findings. This study has validated the ARCS motivation model carried out during the implementation of ODL in the new normal. The study first found that attention significantly positively affects online learning satisfaction. The students are more likely to commit to the learning session if it captures their attention and interest. As highlighted by previous empirical studies, lecturers need to promote, stimulate, and enthuse students to use online learning (Rosengrant et al., 2021; Chandra & Bagdi, 2021; Wang & Antonenko, 2017).

Relevance also has been found as the most significant predictor of online learning satisfaction, which indicates that the more students recognise the perceived usefulness of ODL in their daily lives or future benefits, the higher frequency of students will be engaged in online learning. This is in line with prior studies such as Bridgeland, Dilulio, and Balfanz (2009) and Li and Tsai (2017). UiTM's vision is to produce graduates who are competitive, global and ethical enough to be challenged by all university staffs. To fulfill that desire, lecturers must use all their expertise and experience to provide knowledge the best, latest and relevant to students so that UiTM graduates who are about to face challenges can practice and use as much as possible what has been learned. The students need to feel that what is learned in the online class is closely related to the future job requirement.

Concerning the effect of confidence on online learning satisfaction, the results showed that confidence has a significant effect on online learning satisfaction. This result is consistent with previous studies such as Hew et al. (2020), Nikou and Economides (2017), Wu and Chen (2017), and Salloum and Shaalan (2018), and explained by the notion that if students' capacity and familiarity with handling the learning technologies or platform increases, their satisfaction also will improve. Next, based on regression analysis, relevance is the main predictor that affects online learning satisfaction, also in line with prior studies (e.g., Bridgeland, Dilulio, & Balfanz, 2009; Wolter et al., 2013; Li & Tsai, 2017). Thus, the content of online learning has a more significant impact on student's current and future performance. When online learning has some personal elements, the frequency of online learning usage is also enhanced.

From a practical perspective, our study suggests that universities should emphasize attention, relevance, and confidence to increase online learning satisfaction and quality. Regarding online learning effectiveness, the universities and faculties could implement seminars, webinars, or workshops to educate lecturers and students on using online technologies and platforms. Furthermore, the universities can offer and identify lecturers who need personalized online training sessions to cater to their individual needs. As for satisfaction, relevance has been found to play a more vital part in determining students' online learning satisfaction. Thus, the benefits of technologies and systems should be promoted, which can be helpful in motivating students to continue with online learning. Lecturers also need to continuously monitor the implementation of

ODL by asking the students regularly if they encounter any difficulties and problems during ODL implementation.

CONCLUSION

The current study provides general support concerning the influence of attention, relevance, and confidence on online learning satisfaction during the COVID-19 pandemic crisis. It further confirms that satisfaction with online learning can be enhanced by paying attention to these determinants. The ARCS learning model has the characteristics of four different but interrelated components. According to Keller (2010) the characteristics are: 1) Attention-paying attention to what students need and fostering students' desire to learn by providing stimulation, 2) Relevance-fulfilling personal desires or learning targets for the sake of positive attitude results, 3) Confidence-supporting students to have a sense of self-confidence or students to achieve success and can control the success, and 4) Satisfaction-maintaining performance similar to reward (internal and external). ARCS model has the advantage of being able to raise students' attention during the learning process, expand relevance to student needs, form positive expectations for success, and students have satisfaction with success during learning. Correlational results have proved that all independent variables were significantly influencing student satisfaction. The study also found that relevance emerged as a significant predictor of student satisfaction with online learning.

Although this study provides valuable insights into satisfaction regarding online courses, some limitations need to be addressed. The use of a cross-sectional design restricts the causality linkage between variables. Thus, future research is encouraged to employ longitudinal studies, which could deter the changes in the variables. Second, this study only focused on undergraduate students from Universiti Teknologi MARA (UiTM) Seremban 3 Campus, which could limit the generalization of the finding. Future studies are encouraged to widen the study to other universities or campuses. Third, this study has employed a survey design approach which could limit the findings. The qualitative approach would prompt more answers and views on the study context. Future studies could employ other methods such as interviews, focus group discussions, and observation. Finally, future studies are encouraged to widen the current research model by including other variables such as mediating or moderating variables, demographic influence, user personality, social influence, and others.

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Conflict of Interest

The authors declare no conflict of interest.

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Authors' Contributions

Nurul Hidayana, M. N. contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.