

The Impact of Digital Learning Readiness on Academic Performance and Student Engagement in Sri Lanka

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Abstract

The rapid shift to virtual learning settings has unveiled disparities in preparedness, involvement, and scholarly performance among Sri Lankan government university undergraduate students. This study investigates the impact of Digital Learning Readiness (DLR), Teacher Support (TS), Perceived Usefulness (PU), and Motivation (MDL) on Student Engagement (ENG) and Academic Performance (AP). The general aim is to develop and validate a structural model that explains the mechanisms by which psychological and environmental factors lead to academic performance in online learning contexts. Quantitative research design was employed. A standardized questionnaire was completed by 301 undergraduate students sampled through simple random sampling across ten government universities. Data were analyzed using Structural Equation Modeling (SEM) supplemented by Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Reliability and validity were tested using Cronbach's alpha, Average Variance Extracted (AVE), Composite Reliability (CR), and fit indices for the model through SPSS and SmartPLS. Greater digital learning readiness strongly facilitates student motivation, engagement, and academic achievement. Perceived digital tool usefulness mediates the influence of readiness on academic performance to some extent. Motivation and engagement also have central mediating roles. Support from teachers has a positive impact on motivation, which reinforces student engagement. The study confirms that digital readiness, motivational factors, perceived technology usefulness, and supportive pedagogy are integrated to influence academic performance in digital learning settings. The results have theoretical and practical suggestions for increasing the efficiency of digital learning in the higher education system of Sri Lanka.

Keywords: Academic Performance, Digital Learning Readiness, Motivation, Student Engagement, Teacher Support

Introduction

The introduction speaks of Sri Lanka's long history of education and its transition from traditional schooling to virtual platforms, also spurred on by the COVID-19 pandemic. It speaks of the need for digital learning readiness (DLR) in a situation where the gaps in access, technology literacy, and pedagogical supervision affect learning. While there has been a degree of progress, learners are disadvantaged in terms of infrastructure, motivation, and web interaction. The study is based on theories including Self-Determination Theory, Technology Acceptance Model, and Social Cognitive Theory in explaining motivation, perceived usefulness, and self-efficacy contributing to success in digital learning. The study aims to explore how DLR influences student engagement and academic

performance in government universities based on a structural model. It bridges the existing gaps in Sri Lankan educational studies, presenting possibilities to improve digital infrastructure, pedagogy, and policymaking for efficient, inclusive digital education in Sri Lanka.

The rapid transition to digital learning, particularly in Sri Lanka, has created both opportunities and challenges for students. While digital education offers flexibility and accessibility, its effectiveness depends on several factors, including access to technology, digital literacy, and teacher support. Many students in Sri Lanka face significant barriers, such as inadequate access to personal devices, unstable internet connectivity, and limited knowledge of digital tools, which hinder their ability to participate effectively in online learning. These disparities result in unequal learning experiences, where some students can fully engage in digital education while others struggle due to technological and infrastructural constraints. Additionally, self-efficacy, perceived usefulness of digital tools, and motivation play crucial roles in influencing students' willingness to engage in digital learning. If students lack confidence in their ability to use digital platforms or perceive online education as ineffective, their academic performance and engagement levels may decline. Although previous research has acknowledged the benefits of digital learning, there remains a significant gap in understanding how digital learning readiness directly affects academic performance and student engagement in Sri Lanka. Furthermore, the role of mediating factors such as teacher support, motivation, and ICT literacy has not been sufficiently explored. To address this gap, this study employs a Structural Equation Modeling (SEM) approach to examine the relationships between digital learning readiness, student engagement, and academic performance. By identifying key factors that contribute to successful digital learning, this research will provide valuable insights for educators, policymakers, and institutions to develop effective interventions that improve digital accessibility, enhance student motivation, and create a more inclusive online learning environment. Addressing these challenges is critical to ensuring that students can fully leverage digital education and achieve academic success in the evolving digital landscape.

Materials and Methods

The study employed a quantitative explanatory research design based on a positivist paradigm to explore how Digital Learning Readiness (DLR) affects learning performance and student engagement in Sri Lanka. The population was last year undergraduate students of 10 government universities identified using simple random sampling, where the sample size was 300 students (30 from each university). Data were collected with a targeted questionnaire consisting of eight sections aligned to major variables DLR, study achievement, student interest, teacher support, perceived usefulness, digital self-efficacy, and motivation with a 5-point Likert scale. Operational definitions were applied to each construct to ensure clarity and consistency. The reliability and validity of the questionnaire were confirmed via pilot test and expert opinion. Data were processed according to Structural Equation Modelling (SEM) with the assistance of SPSS and SmartPLS. SEM facilitated both indirect and direct effects between the variables to be measured. Ethical considerations, including informed consent and anonymity, were followed with precision throughout the research.

Results

Two tests were conducted to determine whether the dataset was suitable for factor analysis: Kaiser-Meyer-Olkin (KMO) Measure of 0.963 indicates sampling adequacy. The significant of Bartlett's Test of Sphericity ($\chi^2 = 11378.1$, $p < 0.001$) confirms the factorability of the correlation matrix. Reliability and validity results are shown in Table 1.

Table 1: *Construct reliability and validity*

Variable	Cronbach's alpha	Composite reliability (rho_a)	Average variance extracted (AVE)
AP	0.908	0.908	0.608
DLR	0.909	0.909	0.578
MDL	0.901	0.901	0.591
PU	0.900	0.900	0.589
SE	0.912	0.913	0.619
TS	0.902	0.904	0.594

The reliability and validity results for the measurement model indicate strong internal consistency and acceptable convergent validity across all constructs. Cronbach's alpha values for all variables range from 0.900 to 0.912, exceeding the recommended threshold of 0.70, confirming high internal reliability. Similarly, composite reliability (rho_a) values are consistently high, ranging from 0.900 to 0.913, further supporting the reliability of the constructs. The Average Variance Extracted (AVE) values fell between 0.578 and 0.619, all above the acceptable minimum of 0.50, indicating adequate convergent validity. These results collectively demonstrate that the measurement model is both reliable and valid for further analysis.

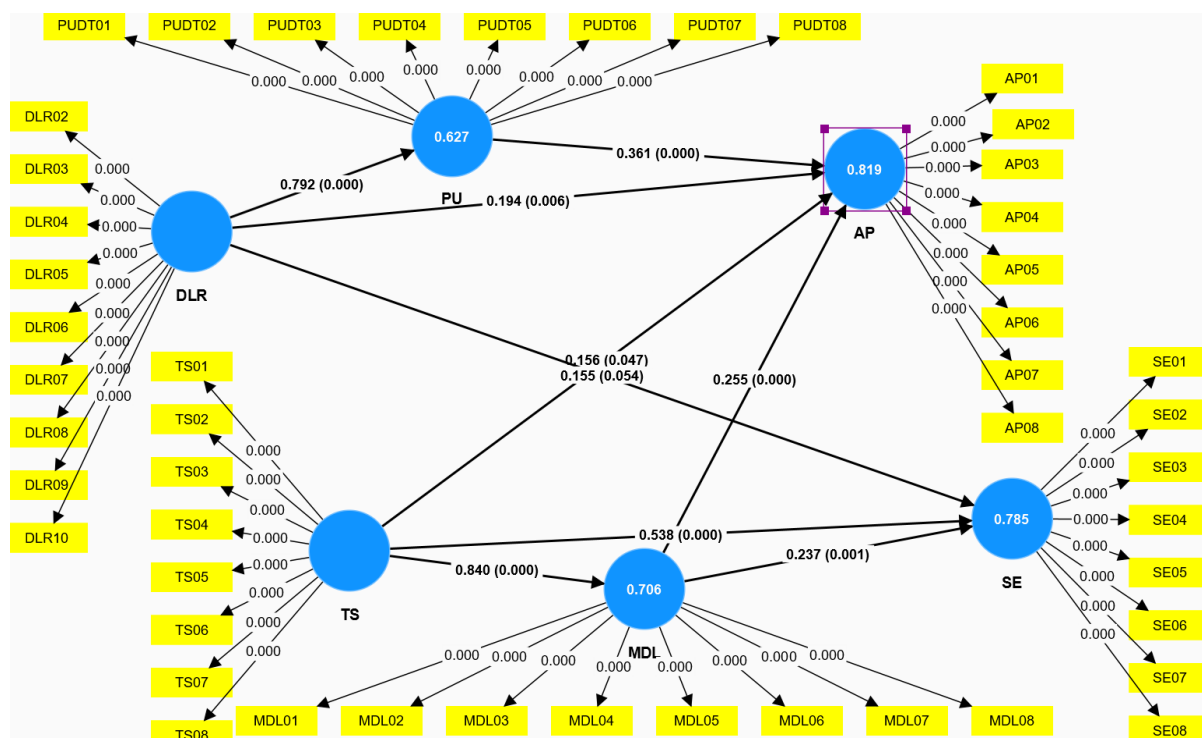


Figure 1: Path analysis results

All nine direct paths were statistically significant at $p < 0.001$, with β coefficients ranging from 0.261 to 0.472. For instance, Digital Learning Readiness significantly influenced Academic Performance ($\beta = 0.381$), Student Engagement ($\beta = 0.426$), Motivation ($\beta = 0.429$), and Perceived Usefulness ($\beta = 0.472$). Teacher Support positively influenced both Motivation ($\beta = 0.372$) and Perceived Usefulness ($\beta = 0.289$). Student Engagement ($\beta = 0.261$) and Perceived Usefulness ($\beta = 0.338$) were also significant predictors of Academic Performance. Findings of the research confirmed that Digital Learning Readiness (DLR) significantly and positively impacts academic achievement and student engagement of Sri Lankan undergraduates. Reliability and validity assessments like Cronbach's Alpha, AVE, and CR indicated that all measurement constructs were statistically reliable. Factor analyses validated the model structure, and structural model results confirmed all hypotheses proposed. DLR directly influenced academic

achievement and student engagement, whereas Perceived Usefulness and Motivation had direct significant mediating effects. Teacher Support was further seen to enhance student motivation, leading to an increase in engagement. Moreover, motivation directly influenced student engagement, which positively impacted academic achievement. These findings reinforce the importance of technical preparedness and psychological determinants to affect students' digital learning achievement. The findings are congruent with existing theoretical models like SDT, TAM, and SCT, offering useful insights for improved digital learning strategies in Sri Lanka's higher education.

Discussion

The findings of this study highlight the pivotal role played by Digital Learning Readiness (DLR) in determining academic success and motivation levels among Sri Lankan undergraduates. The findings reinforce the importance of technological access, digital self-efficacy, and psychological readiness in online learning environments, supporting theoretical models like Self-Determination Theory (Deci & Ryan, 1985), Technology Acceptance Model (Davis, 1989), and Social Cognitive Theory (Bandura, 1986). According to the earlier work conducted by Hung et al. (2010) and Rasheed et al. (2020), the present study confirms once again that students who are more digitally prepared and inclined are more likely to have greater academic performance and active participation. Support by teachers was also found to be one of the leading external determinants of motivation and participation, as presented in Redmond et al. (2018). While the results are of significant worth, limitations include the basis on self-reported data and the uniqueness of the country context. Longitudinal data and investigation into diverse student populations from different socio-economic and geographic contexts could be included to enhance generalizability in subsequent research. Overall, the study contributes to the growing body of work on digital education, providing empirical insights for teachers, policymakers, and institutions interested in improving digital learning systems in developing countries like Sri Lanka.

Conclusions

This study's primary conclusion is that undergraduate students in Sri Lanka benefit from Digital Learning Readiness (DLR) in terms of their academic achievement and level of engagement. More digitally ready, self-efficient, and self-motivated students have more participation and achievement in digital learning environments. In addition, self-rated perceived usefulness of digital tools and teacher support have important mediating roles to enhance the processes. The study also concludes that motivation is a key facilitator of engagement, and engagement improves academic success. By identifying psychological and institutional drivers of digital learning outcomes, this research offers inputs for designing more inclusive and productive digital education policies. Notably, this study supports the establishment of inclusive education in developing countries, guiding educators and policymakers to bridge the digital gap. Lastly, the findings aim to empower learners and promote sustainable academic advancement through digitally-enabled and learner-centered learning settings.

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