EXAMINING MOTIVATION AS AN ANTECEDENT TO ENHANCING LEARNING OUTCOMES IN VIRTUAL LEARNING ENVIRONMENTS

Maria VINU, Indian Institute of Technology, Kharapur, mariavinu@kgpian.iitkgp.ac.in
Sangeeta SAHNEY, Indian Institute of Technology, Kharapur, sahney@vgsom.iitkgp.ac.in

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Abstract

The study examines the impact of motivation on learning outcomes in virtual learning environments (VLE). An integrated model based on the Self-Determination theory and Expectation-Confirmation model was empirically tested using 533 samples from higher education students in India. The measurement model proved the goodness-of-fit of the proposed model with sample data. The structural model reveals that extrinsic motivational factors significantly encourage the use of virtual learning environment (UVLE), but intrinsic motivational factors are weak in encouraging the UVLE. Moreover, UVLE enhances student engagement, learning experience and continuance intention. The findings of the study contribute to both theory and practice.

Introduction

Contemporary educational delivery and access to learning materials are facilitated by technology (Dominici and Palumbo, 2013). Students can learn and engage with teachers and other students in online settings from anywhere independently (Singh and Thurman, 2019). Virtual learning with the advantages of, capacity to break down time and location boundaries, highly targeted material, high virtual interaction efficiency, and repetition of learning, has disrupted traditional learning and accelerated growth (Xu et al., 2024). Virtual spaces facilitating the interaction and collaboration between the stakeholders, sharing of content and resources for teaching-learning purposes are called virtual learning environments (Dayag and Faramarzi, 2024). Virtual tools and technologies improve the learning experiences as learners discover and integrate technology into their learning processes to enhance their learning outcomes (Devisakti and Muftahu, 2023).

Literature review

Motivation is an internal state of mind that drives individuals to involve in goal-oriented behaviour. According to Diseth et al. (2020), intrinsic motivation in educational environments refers to students completing a task or learning activity for their own enjoyment, self-interest, and sense of fulfilment from the learning process. The inclination to do an activity influenced by the anticipation of a result which is separate from the activity is called extrinsic motivation (Legault, 2016). To guarantee students' interest and involvement in the learning tasks, pedagogical design in the virtual learning environment must suitably satisfy these motivations (Chiu, 2022). This study attempts to measure the intrinsic and extrinsic motivation to use VLE which enhance learning outcomes, i.e., student engagement, learning experience and continuance intention.

The failure to increase student motivation and participation in the learning activities is one of the main issues facing e-learning (Khan et al., 2017; Zainuddin et al., 2022; Baxter and Hainey, 2024). One of the biggest obstacles to the success of e-learning is the low acceptance rate and lack of real usage among users (Lwoga, 2014; Bervell and Umar, 2018). Concerns over learning outcomes have been brought up by the gradual expansion of virtual learning. There aren't many studies that examine intrinsic and extrinsic motivation as factors influencing VLE use and learning outcomes.

Based on the impact of motivation to use the VLE on learning outcomes, an integrated SDT and ECM framework was used in this study. The purpose of the study is to examine how learners' motivation to use VLE affected their learning outcomes. A sample of 533 Indian higher education students who participated in virtual learning settings were used to test the hypothesis empirically. The suggested model was examined using covariance-based structural equation modeling.

Theories and hypotheses

Self-Determination Theory (SDT)

SDT (Deci and Ryan, 1985), focuses on the individual's self-motivated behaviour, called self determination. SDT propounds that fulfilment of basic psychological needs like being competent, autonomous, and connected to others induce motivation. SDT focusses on how learners' underlying psychological motives shape their usage patterns. Hence, we hypothesize as

H1a: The use of VLE is positively impacted by Autonomy.

H1b: The use of VLE is positively impacted by Competency.

H1c: The use of VLE is positively impacted by Relatedness.

Expectation-Confirmation Model (ECM)

ECM as a cognitive model (Bhattacherjee, 2001), advocates that use of information system (IS) is influenced by perceived usefulness (PU) of IS and confirmation (CON) of expectation from prior IS use. Hence, we hypothesize as,

H2a: The use of VLE is positively impacted by Perceived usefulness.

H2b: The use of VLE is positively impacted by Confirmation.

VLE and Learning Outcomes

The education sector's recent trend indicates that the future will be a technologically advanced environment. In response, educational institutions must modernise and enhance their services, particularly in the use of teaching and delivery technologies, to ensure the best possible learning outcomes (Dubey and Sahu, 2022). This study attempts to enhance student engagement, learning experience and continuance intention as learning outcomes as the result of using VLE for their learning activities.Hence, we hypothesize as,

H3: Student engagement is positively impacted by use of VLE.

H4: Learning experience is positively impacted by use of VLE.

H5: Continuance intention is positively impacted by use of VLE.

The study used integrated framework of Self-Determination Theory (SDT) and Expectation Confirmation Model (ECM) to measure intrinsic motivational factors (i.e. autonomy, competence and relatedness) and extrinsic motivational factors (i.e. perceived usefulness and confirmation) that encourage the learners to use virtual learning environment, as a result, enhancing the student engagement, learning experience and continuance intention (learning outcomes).

Methodology

An online survey instrument was developed to assess the proposed hypotheses. The students with the experience of e-learning through VLE were the target respondents. The online survey tool was shared through e-mails, WhatsApp, Facebook and other social media, and data was collected between December 2024 to March 2025. The effective sample size for the analysis consisted of 533 usable responses.

Results and discussions

The analysis revealed that Cronbach’s Alpha for each construct exceeded the threshold limit of 0.70, indicating reliability. The CFA results indicated that the values of CR varied between 0.79 and 0.91, exceeding the 0.70 benchmark (Heir et al., 2010). Consequently, the CFA results indicated that a satisfactory level of reliability was achieved for all constructs. The convergent validity of the scale items was determined through the use of AVE. The minimum acceptable AVE value of 0.5 (Fornell &

Larcker, 1981) was achieved for all constructs, with the exception of autonomy (0.492), competence (0.490), and student engagement (0.498). Nonetheless, given that the composite reliability values for the three constructs exceeded the necessary threshold (> 0.70), it can be concluded that the scales employed in this study possess the requisite convergent validity. The CFA results indicated that the t value for each item exceeded 1.96 ($p<0.05$) (Anderson and Gerbing, 1988), providing evidence of convergent validity. Consequently, the items significantly represent their respective constructs. The assessment of discriminant validity was conducted through Heterotrait-Monotrait (HTMT) ratios, which fell within the acceptable threshold of 0.85 (Henseler et al., 2015), thereby confirming the establishment of discriminant validity.

Measurement model

The overall fit indices of the measurement model were $\chi2 = 2303.749$; df = 1109; $\chi2$ /df = 2.077, $p < 0.001$, GFI = 0.844; AGFI = 0.821; TLI = 0.927; CFI = 0.934; RMSEA = 0.045; and SRMR = 0.052. The findings from the CFA indicate that the majority of the indices exceed their respective commonly accepted thresholds. Consequently, the proposed model aligns effectively with the sample data.

Structural model

The findings from the structural model indicated the overall fit indices as follows: $\chi2= 2500.788$; df = 1127; $\chi2$/df = 2.219, $p < 0.001$, GFI = 0.830; AGFI = 0.808; TLI = 0.917; CFI = 0.924; RMSEA = 0.048 and SRMR = 0.063: According to the guidelines established in previous studies (e.g. Ullman, 2001; Schumacker & Lomax, 2004; Hair et al., 2010; Bentler, 1990; Hu and Bentler, 1998), the fit indices for the structural model are satisfactory, suggesting that the model aligns with the data effectively.

Hypothesis testing

The data indicates that 78.3% of the variance in UVLE can be accounted for by intrinsic and extrinsic motivational factors, specifically AU, COM, REL, PU, and CON. Furthermore, it indicates that 44.9%, 74.7%, and 70.4% of the variance in SE, LE, and CI, respectively, is attributed to the use of virtual learning environments. The element of intrinsic motivation, specifically autonomy, demonstrates a positive yet statistically insignificant effect ($\beta = .07$, $t = 1.631$, $p = .103$) on the use of virtual learning environments. Therefore, H1a was not supported. Competence ($\beta = .144$, $t = 2.192$, $p < .05$) and relatedness ($\beta = .096$, $t = 1.990$, $p < .05$) demonstrate a positive and significant impact on UVLE, thereby providing support for H1b and H1c. The factors of extrinsic motivation, specifically perceived usefulness ($\beta = .350$, $t = 6.321$, $p < .001$) and confirmation ($\beta = .351$, $t = 5.926$, $p < .001$), demonstrate a positive and significant effect on UVLE. Therefore, this provides support for H2a and H2b. UVLE ($\beta = .670$, $t = 13.593$, $p < .001$) significantly influences learning outcomes by positively impacting student engagement. Therefore, this provides support for H3. The impact of UVLE ($\beta = .864$, $t = 15.092$, $p < .001$) on the learning experience was both positive and significant, thereby providing support for H4. The impact of UVLE ($\beta = .839$, $t = 17.041$, $p < .001$) on continuance intention was found to be both positive and statistically significant. Hence, H5 was supported.

Contributions -

The findings are suggestive of the behavior of students of higher education towards the usage of VLE. The students tend to use new modes of learning when their basic psychological needs are fulfilled, when they are self-motivated, when they receive acknowledgement of their skills and knowledge, social acceptance, and when their expectation are met. Therefore, while offering virtual courses, the educational institutions must take utmost care on students' autonomy, competence and relatedness, since these act as the important intrinsic motivating factors to use of VLE. Further, the study identifies perceived usefulness and confirmation as extrinsic motivators, which have a huge impact on the use of VLE. On the contrary, intrinsic motivators fail to have such a high impact on the use of VLE. Thus, as practical implications, authorities and virtual platform designers must look into designing VLE with

integrated features of need for autonomy, competence and relatedness of students, which intrinsically induce a behavioural change in the students to use VLE. It is the need of the hour is to develop a positive belief and trust amongst students regarding autonomy, competence and relatedness as they are strong
intrinsic predictors of use of VLE. As social implications, enhancement of learning outcomes due to use of VLE may lead to acceptance of this modality of learning in society.

Conclusion

The learners recognise the beneficial impact of usefulness and confirmation on the use of VLE. Consequently, motivation to use any VLE can be accomplished by incorporating both factors into e learning settings, while the usage of VLE empirically supports and improves learning outcomes. The motivational factors positively influence the usage of VLE, while the use of VLE significantly affects student engagement, learning experience, and continuance intention. This study presents a novel opportunity for policymakers, course designers of virtual learning environments, and academics to explore additional theories and factors that promote the use of virtual learning modalities in higher education.

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