

Transformative learning experiences: An empirical analysis of hybrid learning effectiveness in management education in Sri Lanka

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Abstract: Hybrid learning (HL) has become a significant part of the learning style for the higher education sector in the Sri Lankan context amidst the COVID-19 pandemic and the subsequent economic crisis. This research study aims to discover the effectiveness of hybrid learning (EHL) practices in enhancing undergraduates' outcomes in Sri Lankan Higher Educational Institutions (HEIs) management faculties. The data for the study were gathered through an online questionnaire survey, which received 379 responses. The questionnaire contained 38 questions under four sections covering independent variables, excluding demographic questions. The results indicate that hybrid learner attitude, interaction, and benefits of hybrid learning positively impact the effectiveness of hybrid learning. The results remain consistent even after controlling for socio-demographic factors and focusing only on students employed during their higher education. The study concluded that employed students have a higher preference for the effectiveness of hybrid learning concepts, and the benefits of hybrid learning play a crucial role in enhancing the effectiveness among undergraduates. The study analyzes COVID-19's impact on higher education, proposing hybrid learning and regulatory frameworks based on pandemic experiences while stressing the benefits of remote teaching and research.

Keywords: hybrid learning; COVID-19 pandemic; higher education; effectiveness of hybrid learning; educational infrastructure

1. Introduction

The COVID-19 pandemic has negatively impacted the global economy, creating global challenges and uncertainties worldwide (Aduhene & Osei-Assibey, 2021). The pandemic, with its several emerging waves and variants, has disrupted the regular lives and work of individuals across the globe (Ahmad et al., 2020; Fernandes, 2020; Liu and Gao, 2022). Moreover, the pandemic has greatly impacted higher education, with physical learning and student engagement being disrupted by lockdowns (Broadbent et al., 2022). Pal (2022) found that the marked changes in the delivery and participation of lectures by educational institutions have marred students' academics with several difficulties. This, in turn, created a crisis in the educational sector. In the new normal context, Hybrid Learning (HL), also called Blended Learning (BL), has emerged as an effective solution to meet contemporary society's evolving educational needs, especially in developing countries. It is characterized by a unique blend of face-to-face and non-face-to-face instruction facilitated by advanced information and communication technologies (ICT). Han and Ellis (2023) revealed that the HL approach offers in-person students the opportunity to access online content, enhancing

their overall learning experience.

HL was proposed by universities as a model that later became known as HL or BL. The pandemic has impacted HL and developed countries have allocated budgets for technology infrastructure to maintain educational quality, especially in major areas. These techniques have also helped universities to develop courses that students could access outside formal classrooms or in the HL environment (Bamoallem and Altarteer, 2022; Fearon et al., 2011). Cheng (2022) proposed an effective method for assessing the Effectiveness of Hybrid Learning (EHL) on a wide range of undergraduate learning processes. The present study endeavors to support all stakeholders, including students and educators, in transitioning to the “new normal” of education post-COVID-19. First, the study enables undergraduates to carry out their educational activities more effectively, in a user-friendly and convenient manner, through new technologies. This can increase students’ interest, attitude, Motivation, and time management skills, enhancing their educational activities from a convenient location without additional burdens. Second, amid the COVID-19 pandemic and the subsequent economic crisis, individuals have been confined to their residences, and the conventional mode of operation of educational institutions, too, has been disrupted. Consequently, the HL concept has emerged as a feasible and lasting solution to the adverse scenario triggered by the crisis. By introducing a novel approach to learning activities in a highly technological environment, this study aims to facilitate the reorganization and adaptation of educational activities. Third, prior research on undergraduates and university academics in Sri Lanka has been remarkably scarce, leaving future consequences and policymaking largely unaddressed (Rathnayake et al., 2022).

Finally, the findings of this study are expected to be instructive to policymakers in Sri Lanka’s higher education sector as they work towards improving undergraduate students’ learning productivity. Therefore, the present study aims to fill this gap by identifying EHL practices among undergraduates in the Sri Lankan context.

2. Literature review

The researchers consulted several journal sources like ScienceDirect, Web of Science, ResearchGate, Scopus, and Google Scholar for the literature review. They identified independent variables such as hybrid learner attitude (HLA), hybrid learner interaction (HLI), benefits of hybrid learning (BHL), and obstacles to hybrid learning (OHL) to clarify the study’s dependent variable, the EHL. The current study investigates EHL from the student’s perspective and focuses on variables such as HLA, HLI, BHL, and OHL.

Hybrid learning combines traditional classroom or face-to-face instruction with online computer-based instruction to achieve learning objectives (Batubara, 2021; Vernadakis et al., 2011). The entire literature examination process is summarized in **Figure 1**.

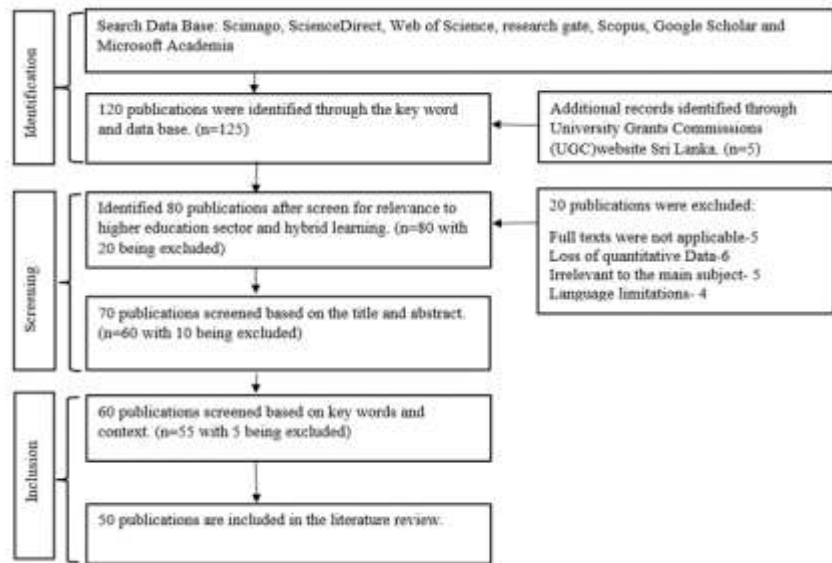


Figure 1. Literature source flow diagram.

Source: Based on the author’s observations and Moher et al. (2009).

Education and learning have experienced numerous innovations, including employing technology through HL (Islam et al., 2022). The effectiveness of HL is a recently identified and creative learning channel integrating new technology into conventional classrooms (Albashtawi & Al Bataineh, 2020). Hybrid learning is effective, but presents challenges for continuous learning. Learners’ backgrounds and characteristics influence their ability to engage effectively. Design tools employed may affect HL’s efficacy (Le et al., 2022).

Hybrid learner attitude has three primary components: cognitive, affective, and behavioral. These three components offer distinct perspectives on sufficiency issues and provide differential solutions (Perry et al., 2020). Platto et al. (2022) explored students’ perceptions of HL using the ABC model of attitude. The ABC model assesses attitudes through affective, behavioral, and cognitive components using moderate-intensity activities. A psychological mindset is a better predictor of a global mindset than an emotive mindset. Attitudes affect actions and emotions (Brand et al., 2020). Regarding previous research, the affective component related to HL may have either positive or negative implications (Wang & Hollett, 2022). According to research by Helms (2014), non-verbal behaviors such as laughing, speaking, body language, and staring indicate competence. The cognitive component of attitudes can be understood by examining an individual’s beliefs about the attitude object (Rodgers & Pienaar, 2018). Additionally, educational outcomes are determined by the dynamic nature of the educational environment, including its uses, design, and beliefs. Investigating the effectiveness of cognitive learning outcomes adds complexity to this multifaceted issue (Tumasis, 2022).

According to the literature findings, most Sri Lankan undergraduate students need more experience in the HL area. However, they have a positive outlook on practically obtaining their education at home and have yet to mention any substantial challenges in this aspect. Therefore, we construct the following hypothesis:

Hypothesis 1. Hybrid learner attitudes have a positive impact on the effectiveness of hybrid learning.

Interaction is a crucial component of learning, regardless of whether it takes place in traditional or digital settings. Research by Le Minh (2022) has shown that undergraduates are often more self-aware; hence, HL has no significant impact on their learning outcomes. Thus, interactive interaction with peers is necessary for the learning process. Nuryanto (2021) evaluated these e-learning systems, graded beneficial sessions for each learner, and found a strong relationship between the session grades and the input student characteristics. In a dynamic learning environment, students can investigate, engage with, comment on, modify, and apply the predefined material (Raes, 2022). In this setting, they can work towards predefined academic achievement based on research discipline and industry guidelines (Norgard, 2021). The fast-paced technological nature of the HL concept and the use of dissimilar technical tools have created a more effective and positive impact on the learner's interaction (Simonova et al., 2023). Moreover, students are attracted to the HL concept because it has improved their ability to speak English through presentations, viva, and classroom discussions (Wut et al., 2022). In addition, the concept of HL has enabled employed students to manage their time efficiently and minimize additional costs, significantly enhancing the HL experience (Lothridge et al., 2013). The authors suggest that instructors' involvement, inspiration, engagement, and student interactions improve the EHL, leading to the formation of a hypothesis.

Hypothesis 2. Hybrid learner interaction has a positive impact on the effectiveness of hybrid learning.

In the past, distance education relied on traditional mail for communication between students and faculty, and hardcopy materials for academic support. However, research by Nuryanto (2021) has indicated that such traditional support services must be more effective in promptly addressing remote learners' technological challenges. Consequently, Looi et al. (2022) have emerged as a viable solution to support online education, allowing for virtual monitoring and utilization of datasets and providing a practical framework for sharing and collaborating between teachers and students. Proficiency in learning, writing, designing, and formatting messages and other pertinent information is a crucial component of online education (Kastornova & Gerova, 2021). Although chat software allows students to use a diverse range of internet service providers, most remote undergraduates prefer a written mode of communication (Muhammad, 2021). In 2021, the United Nations Educational, Scientific and Cultural Organization (UNESCO) stated that the COVID-19 pandemic led to the closure of schools and universities, impacting over 1.5 billion youth and children in 195 countries worldwide. The number of school closures is highest in North and South America, Australia, and most South Asian countries. More than half of these students lacked computer access, and more than 40% lacked internet connectivity at home (Muhammad, 2021).

Another obstacle faced by students was the need for more infrastructure (Aljedaani et al., 2022). The attendance schedule for students' modules involved one week of online learning (OL) and the following week of physical learning (Miseviciene et al., 2018). HL's hardware and software requirements were mandatory (Carte et al., 2011). Although some students had hardware and software facilities, they needed a fast internet connection to continue their OL. As a result, students are seen to be highly frustrated with such obstacles (Dassanayaka et al., 2022). Additionally,

the Motivation of talented students has the potential to negatively impact HL, which can be highly challenging for students to interpret (Aristika et al., 2021).

On this background, the following hypothesis is made:

Hypothesis 3. There is a positive impact on obstacles of hybrid learning with the effectiveness of hybrid learning. HL methods benefit students, especially distance learners, by allowing remote participation in lectures (Abdelmalak & Parra, 2016). HL students can easily access elective courses and lectures that align with their interests. Incorporating external knowledge provides a broader range of perspectives, and interaction between in-person and online students enriches the learning experience (Yang et al., 2023). As such, HL fosters an inclusive learning environment that encourages engagement, critical thinking, and knowledge-sharing (Tulaskar & Turunen, 2022). HL is a promising approach that complements traditional teaching methods, enabling more effective student learning outcomes. It improves social connections between physical and virtual lecturers and increases students' responsiveness to meeting people from diverse locations (Li et al., 2021). HL offers the traditional class experience to both online and in-person students, teaches them how to use various technologies, and prepares them for the highly technological job market (Jamil et al., 2022). On this background, the following hypothesis is made:

Hypothesis 4. There is a positive impact on the benefits of hybrid learning with the effectiveness of hybrid learning.

This study aims to determine the extent of EHL practices among Sri Lankan undergraduate students. Its findings can provide valuable insights to policymakers in enhancing the educational efficiency of undergraduates.

3. Materials and methods

The study in Sri Lanka aimed to measure the EHL among undergraduate students enrolled in commerce and management degree programs in universities approved by the University Grants Commission (UGC), Sri Lanka. According to the latest report from the University Grants Commission-Sri Lanka (2021), 83,617 undergraduate students are currently enrolled in universities countrywide. Out of the total student population, 24,227 participants were chosen for the study as they had undergone an HL program as part of their academic curriculum for approximately two years. The study participants were recruited from 14 universities in various locations, ensuring a diverse representation of the undergraduate student population. The survey questionnaire and its respective data are available on Mendeley Data, version 1 (Kumarasinghe and Rathnayake, 2024).

Simple random sampling was employed to choose a subset of individuals as respondents from the larger population for the study. Management and commerce undergraduates, totaling 379 students, were included in the primary data collection process out of 24,227 students. The growing importance of having a statistically representative sample of data (379) in research has led to the development of effective methods for determining the appropriate sample size. Krejcie and Morgan (1970) developed a table to determine the appropriate sample size for a given population, which can be easily referenced to fill the existing gap.

The study used a Google questionnaire web form to collect quantitative data. The

survey was distributed through Gmail and social media, and Google Forms helped automate data collection and storage in an MS Excel file. The collected data underwent statistical analysis for descriptive purposes, with the study reporting the results and their contextual significance to other studies. A survey questionnaire using a five-point Likert scale was developed to record the responses of the management and commerce faculty undergraduates, where five indicated “strongly agree” and one indicated “strongly disagree.” Pilot studies were conducted to test the questionnaire’s accuracy and clarity with students.

The data collection instrument includes 39 questions that cover all aspects of the conceptual framework. To validate the obstacles of hybrid learning, sample questions have been included, such as “To what extent is expensive technical support, mental effort, and hybrid learning infrastructure required?” To validate the hybrid learner attitude construct, participants were asked to describe their feelings comprehensively, for example, “I am in favor of incorporating hybrid learning into my course, and my interest in subjects will depend on the hybrid learning platform.” Hybrid learner interaction was measured using queries such as “Did interaction with the lecturer generate opportunities in hybrid learning?” Hybrid learner benefits were measured using factors such as the ability to develop the student’s technical skills and the use of digital technology. Finally, the effectiveness of hybrid learning was measured with the help of queries known as “The method of sharing learning resources was appropriate, and students helped each other and shared learning material equally in both online and physical learning.

3.1. Reliability test results

The reliability analysis results measured by Cronbach’s alpha coefficients indicate that the measure deployed in this study possesses a high level of internal consistency (See **Table 1**). In conclusion, the study’s findings offered convincing proof of the measure’s internal consistency and reliability.

Table 1. Cronbach’s alpha values of main study variables.

Variables	Reliability (Cronbach’s alpha)	Number of items
OHL	0.8546	12
HLA	0.9402	09
HLI	0.8961	04
BHL	0.9030	07
EHL	0.9139	07

Source: Based on the authors’ calculations.

3.2. Analytical framework

The study used multiple regression models to test hypotheses regarding the undergraduates’ perception of EHL. For this study, multiple regression analysis was chosen as the preferred analytical technique due to its ability to address the specific research objectives. This method allows us to examine the unique contribution of each independent variable to the variation in the dependent variable while controlling for other variables. Structural equation modeling and logistic regression, alternative

Multivariate analysis methods, were not considered due to their complexity of implementation and the need for additional data assumptions (Weerasinghe et al., 2023; Gamage et al., 2023). Multiple regression analysis is widely used in educational research to explore various educational outcome predictors (Rathnayake et al., 2022; Thathsarani et al., 2023; Weerarathna et al., 2023). Thus, for this study, we have chosen to conduct the analysis using multiple regression analysis. The specified baseline model is given below:

$$EHL_i = \beta_0 + \beta_1 HLA_i + \beta_2 HLI_i + \beta_3 BHL_i + \beta_4 OHL_i + \beta_5 DM_i + \varepsilon_i \quad (1)$$

The variable EHL_i signifies the EHL for each undergraduate student, *i*. The variables HLA, HLI, BHL, and OHL represent the attitude of the hybrid learner, the interaction between the hybrid learner, the benefits of HL, and the obstacles of HL, respectively. DM_i symbolizes the dummy control variables that are unique to each undergraduate student, and ε_i signifies the random error term at the individual level. Additionally, other regression models with different specifications were calculated to test the reliability of the baseline results.

4. Results

The following section presents the descriptive statistics of the primary study variables, providing a foundational overview before delving into the results and discussions about the study’s findings.

4.1. Descriptive Statistics

This study examines undergraduates’ experiences with EHL in higher education. **Table 2** provides descriptive statistics. Most respondents (81.3%) were from state universities in Sri Lanka, while the rest (18.7%) were from private universities, representing the sample population. The sample was primarily taken from management or business faculties of Sri Lankan HEI, and all respondents were undergraduates.

Hybrid learner attitude measured by HLA, hybrid learner interaction measured by HLI, obstacles of HL measured by OHL, and benefits of HL measured by BHL were the independent variables in the model. On average, participants had a 4.412 OHL level ranging between 2 and 5. HLA, HLI, and BHL levels were 4.569, 4.424, and 4.654 respectively. The minimum reported levels were 1 or 2, and the maximum was 5 for all. **Table 2** contains the descriptive statistics.

Table 2. Descriptive statistics.

Variables	N	Mean	Std. D	Min	Max	Var	Skewness	Kurtosis	Sum
OHL	379	4.412	0.8419	2	5	0.708	-1.380	4.102	1673
HLA	379	4.569	0.7747	2	5	0.600	-1.857	5.736	1732
HLI	379	4.424	0.8492	1	5	0.721	-1.476	4.537	1677
BHL	379	4.654	0.6377	2	5	0.406	-1.940	6.556	1764
EHL	379	4.614	0.6972	2	5	0.486	-1.891	6.141	1749

Source: Based on authors’ calculations.

The mean value of EHL was 4.614, with a standard deviation of 0.6972. Most

participants scored above the scale's midpoint, with a slight score variation. The skewness was slightly positively skewed, and the kurtosis was highly peaked around the mean. The variance of 0.486 implied that the observations were relatively similar to the mean values.

4.2. Baseline regression results

The data analysis applied for (4) different multiple linear regression models. Model (1) included the primary variables of the study. Model (2) added dummy variables to the primary variables. Model (3) tested the robustness of the regression results using only students from state universities. Finally, model (4) considered the impact of full-time employment on the study program by only including students who experienced it during the program in the regression analysis.

The study conducted model specification tests to assess the performance of various models. The tests checked for multicollinearity among demographic and independent variables using the variance inflation factor (VIF) and tolerance. The results showed low levels of multicollinearity, with a maximum VIF of 2.43 and a maximum tolerance of 0.9022, indicating no significant intercorrelation between the variables.

Table 3 presented findings from the baseline regression, and three alternative models demonstrated that HLA positively impacts EHL ($B = 0.198, P < 0.001$). This indicates that a high level of HLA significantly raises the index value of its influence on EHL. The direction of their relationship remained the same even after controlling for numerous socio-demographic factors such as gender, education institute, academic year, and employment status ($B = 0.196, P < 0.001$). The influence of the state or private sector on the baseline results was also checked by estimating an alternative model excluding private sector universities. The results remained unchanged ($B = 0.232, P < 0.001$), indicating that a higher index value of HLA continues to increase the index of the relationship with EHL significantly.

Finally, after incorporating model (4) using responses from students who are employed during their higher education, the results showed that a positive impact still exists at HLA on EHL ($B = 0.154, P < 0.001$), and such students showed a higher preference for the EHL concept.

The study's findings in **Table 3** indicated that a HLI significantly impacted the EHL index ($B = 0.286, P < 0.001$). This relationship remained robust even when considering various socio-demographic factors such as gender, institution type, academic year, and employment status ($B = 0.259, P < 0.001$). When the model was re-calculated, including only the responses from students at HEI, the results still demonstrated that an increase in the HLI index value led to a significant increase in the EHL index value ($B = 0.162, P < 0.001$). Additionally, results from model 4, including responses from students employed while attending HEI, showed that HLI had a statistically significant positive impact on EHL ($B = 0.321, P < 0.001$), implying that employed students have a strong inclination towards the EHL concept. This means that HLI positively affected the EHL index, even after controlling for factors like gender, institution type, academic year, and employment status. Results indicated a strong inclination towards EHL among students.

Table 3. Regression results.

Variables	Model (1)	Model (2)	Model (3)	Model (4)
Gender		-0.0523 (-1.08)	-0.0635 (-1.21)	-0.0268 (-0.49)
Higher Education Institute		0.0140 ** (2.78)	0.0148 * (2.53)	0.0162 ** (2.82)
Academic Year		0.0241 (1.00)	-0.0257 (-0.95)	-0.00888 (-0.32)
HLA	0.198 *** (4.44)	0.196 *** (4.41)	0.232 *** (4.80)	0.154 ** (2.95)
HLI	0.286 *** (7.63)	0.259 *** (6.73)	0.162 *** (3.45)	0.321 *** (7.02)
BHL	0.367 *** (8.07)	0.371 *** (8.24)	0.440 *** (8.68)	0.388 *** (7.20)
OHL	-0.0123 (-0.44)	-0.00805 (-0.29)	-0.0359 (-1.26)	0.0198 (0.65)
Constant	0.798 *** (4.18)	0.774 *** (3.89)	0.983 *** (4.42)	0.536 * (2.14)
Observations	379	379	308	264
R- Squared	0.603	0.614	0.577	0.598

Source: Based on the author's calculations.

Results of the baseline regression in **Table 3** exposed data showed that the BHL has a favorable impact on EHL ($B = 0.367$, $P < 0.001$)—a higher level of BHL results in a significant increase in the EHL index. The direction of this relationship remains unchanged even after considering various socio-demographic factors such as gender, HEI, academic year, and employment status ($B = 0.371$, $P < 0.001$). To determine the influence of state and private sector universities, another model was created excluding private sector universities. The results indicated that the positive impact of the BHL on EHL still exists ($B = 0.440$, $P < 0.001$). Moreover, this shows that an increase in the BHL index leads to a significant increase in the EHL index, implying a positive influence on EHL. Model 4, which includes responses from students employed while in HEI, demonstrated that the BHL significantly impacted EHL ($B = 0.388$, $P < 0.001$). This suggests that employed students are strongly interested in the concept of EHL. Therefore, the BHL is crucial in enhancing EHL among students employed during their higher education.

Lastly, the findings in **Table 3** indicate that the OHL hurts the EHL. However, this relationship is not statistically significant ($B = -0.0123$, $P > 0.05$). Despite controlling for various socio-demographic factors such as gender, HEI, academic year, and employment status, the outcomes have not changed ($B = -0.00805$, $P > 0.05$). The relationship is still weak and not statistically significant. To examine the influence of academic discipline or faculty on the results, another model was calculated excluding private sector universities, and the results remained unchanged ($B = -0.0359$, $P > 0.05$).

This suggests that the sectors of academic discipline or faculty in which students are enrolled do not influence the preceding model's outcomes. However, the results indicate a relationship between OHL and EHL when only considering students employed during their higher education (model 4). However, it is weak and not

statistically significant ($B = 0.0198$, $P > 0.05$). Based on the B values obtained from all four models, the results of this study suggest that OHL has a negative influence on its effectiveness. However, this relationship is not statistically significant. The relationship remains unchanged even after controlling for various socio-demographic factors and looking at only students employed during their higher education.

5. Discussion

Multiple linear regression models were used to analyze the data and understand the relationships between study variables. Four models were constructed to test the robustness of the findings, including variables such as dummy variables and students' employment status. The first model of the study examined the attitudes towards EHL, a form of distance education in education technology. The results showed that HLA, HLI, and BHL had a significant positive attitude towards EHL ($p < 0.01$), while OHL had an insignificant negative attitude ($p > 0.01$). HL factors affected EHL perceptions during and after the pandemic, as confirmed by the previous model. Wang & Hollett (2022); found that college students hold positive beliefs about physical exercise at various levels, but emotional responses vary by intensity, requiring attention (Jamil et al., 2022). The study found consistent outcomes for the main variables in models 1 and 2. Models 3 and 4 highlighted the need to examine barriers to implementing HL. Model 4 revealed a non-significant negative correlation between OHL and EHL. These results align with prior studies by Muhammad (2021). The study confirmed a positive correlation between learners' adoption of HL practices and learning effectiveness in HEI. The research evaluated HL's impact by considering awareness, adoption, and outcomes.

The findings revealed that the HLA towards HL positively impacts the EHL. Affirming this finding, the study found a positive correlation between students' favorable opinions of OL and their online interactions with peers and educators. Tumasis (2022) found a positive correlation between students' perception of OL and their readiness for HL, supporting the suitability of HL in Sri Lankan HEI. Successful online education in a HL approach is attributed to financial support, learning management, home circumstances, technology use, and time management (Li et al., 2021). Therefore, the advantages of flexibility and cost savings have allowed undergraduates to have a favorable impact on HL. Elgohary et al. (2022) found HL education comparable to traditional training in outcomes and cost efficiency. Muhammad (2021) suggested that student recognition, staff responsiveness, engagement, and management policies positively impact HL adoption and learning effectiveness, benefiting EHL.

Students in business programs show an increased preference for academic interaction over traditional learning, emphasizing a shift towards collaborative and interactive learning environments and stressing HL's significance in postgraduate oral medical training. Online networks and HL enhance communication but require further research and educator involvement. Sriarunrasme et al. (2015) propose combining OL with physical events for effective HL, improving learning and satisfaction. The study revealed positive perceptions of instructor-learner interaction among Sri Lankan HEI students. This aligns with a study on Chinese students' HL satisfaction during the

COVID-19 shift to OL (Agyeiwaah et al., 2022). Another study analyzed classroom activities, learning practices, and interaction of adult students in Spanish open universities in courses with or without ICT (Grigorkevich et al., 2022).

Grigorkevich et al. (2022) corroborated the findings and found a strong positive association between HLA and EHL among undergraduate students in remote learning environments. This aligns with previous research, such as Turnbull et al. (2021), emphasizing the opportunities presented by the current situation for enhanced access to quality education. Hybrid and virtual learning offer advantages such as time efficiency and environmental sustainability. Gaffas (2023) found positive experiences in Saudi Arabia with virtual and traditional English language learning. Video-based learning improves retention and academic performance, while collaborative learning enhances EHL by increasing Motivation and involvement and fostering collaboration (Mendieta-Aragón et al., 2022). As observed in this study, instructors' active participation and engagement enhance EHL. HL significantly impacts clinical skills education for graduate nursing students when supporting learning. Educators should use technology to engage and inspire students (Bloomfield & Jones, 2013).

Unveiling some lesser-discussed aspects in HL, Grigorkevich et al. (2022) revealed that the COVID-19 pandemic impacted higher education and shifted toward remote learning. The study suggests promoting digital transformation in higher education, addressing disparities, and improving the overall HL experience for students. To address these drawbacks, university administrators should provide institutional support, policies, training, and HL options and maintain online opportunities for learning communities (Turnbull et al., 2021).

Effective communication, including face-to-face interaction and prompt responses, is critical for promoting HL. Models 3 and 4 showed a significant impact of HLI on EHL ($p < 0.1$), emphasizing the need to integrate HL and practical communication into policies. Universities and public funding agencies are crucial in responding promptly to public health emergencies. In a supportive organizational culture, hybrid learning can be enhanced by satisfaction, control, time management, cost savings, work-life balance, and positive feedback. A study by Thongmak (2021) also found that their self-sufficiency affects employed students' HL interaction.

Furthermore, the students showed a negative relationship between OHL and EHL. The previous study suggests that this educational experiment could enhance EHL and decrease OHL by raising student motivation, accountability, and engagement, promoting a deeper understanding and collaboration among learners (Mendieta-Aragón et al., 2022). Digital learning improved undergraduates' information retention and performance. Students value collaborative and active methods like online video lectures. Policymakers must address unequal technology access in Sri Lanka and expand suitable HL options. Overall, Alshamsi et al. (2023) suggested that the HL environment, opportunities for demonstration, Motivation, professional development, and participation are essential for a successful HL experience.

Gender significantly affects EHL impact ($p < 0.01$). Female Sri Lankan university students show lower Motivation for EHL than males, who are more willing to integrate technology into education (Alshamsi et al., 2023). Gender imbalance in accessing and participating in technology-assisted HL needs further examination. Removing private sector participants from model 3 revealed the negative impact of

the academic year on state university students taking online classes, especially those attending remote lectures. State university students may need help with technology-driven distance education due to technical issues, limited ICTI, unfamiliarity with OL platforms, and high costs (Li et al., 2021).

The study variables affecting EHL significantly impact its effectiveness. Sri Lankan undergraduate students showed a positive attitude towards continuing their studies at home. They were receptive to online lectures and activities. Effective organization and relevance of online materials are crucial for successful HL implementation. Results of the online survey indicated a positive attitude towards HL. Moreover, the positive relationship between instructors and students significantly impacts the EHL. The advantages of HL, including self-learning, time management, flexibility, cost savings, and the availability of recorded lecture materials, contribute positively to its effectiveness (Dias et al., 2023). However, obstacles such as inadequate ICT infrastructure, connectivity issues, lack of support services, and limited ICT knowledge negatively impact the EHL. Despite these challenges, students remain eager to continue their HL learning experiences. In today's increasing complexity and competitiveness in business, fostering student autonomy and self-directed learning is advantageous for students' prospective careers.

6. Practical implications

The study investigated the impact of COVID-19 on higher education and the consequent shift towards Hybrid Learning (HL). It argues for developing regulatory frameworks based on pandemic experiences and highlights the benefits of remote teaching and research. The study found that positive student attitudes toward HL can improve learning outcomes, with Hybrid Learning Environments (HLE) promoting increased engagement. Strategies promoting interaction and addressing challenges are identified as crucial for effectively implementing Hybrid Learning (EHL). Bridging Hybrid Learning (BHL) is essential to the success of HL, suggesting that marketing strategies should emphasize its positive aspects.

Additionally, technical difficulties encountered in Online Hybrid Learning (OHL) can significantly impact learning, highlighting the need for adequate resources and support mechanisms. The study recognizes Sri Lanka's impressive strides in technology implementation during the pandemic. However, it emphasizes the importance of further research to explore postgraduate students' perspectives and assess the generalizability of the findings across other academic disciplines. By providing insights into Sri Lanka's higher education policy context, the study contributes to informed decision-making and advancing regional educational practices.

7. Limitations and future directions

It is important to note that this study has some limitations that should be considered. One well-known limitation is the study's time frame, which was only nine months. Another limitation was the reluctance of some participants to provide data. Despite this limitation, the study's authors ensured that the researchers' privacy and credibility were protected. A mixed-methods approach could provide deeper insights for future research by combining quantitative data with qualitative perspectives.

Additionally, the current study used a cross-sectional time horizon, and future studies could use a longitudinal time horizon to see how EHL patterns change over time. Exploring additional variables like socioeconomic status and technological infrastructure could improve our understanding. Comparative studies across academic disciplines and institutions could highlight contextual factors that shape EHL. By addressing these limitations and pursuing these future research directions, we can advance our understanding and develop effective strategies for promoting high-quality hybrid learning experiences in higher education settings.

8. Conclusions

The rising prevalence of HL in academic institutions necessitates evaluating its impact on educational outcomes. This study utilized an internet-based questionnaire to assess EHL in Sri Lanka's education system. HLA, HLI, BHL, and OHL were examined for their relationship with EHL. Regression analysis revealed positive effects of HLA, HLI, and BHL on EHL, while OHL showed a non-significant negative impact. Inadequate ICT proficiency, connectivity issues, and limited support services impede student engagement in HL. Overcoming these obstacles is crucial for full participation. Traditional offline learning with face-to-face interactions is more effective and participatory than HL. Sri Lankan management undergraduates have positive responses to EHL, indicating its feasibility. They embrace technology and traditional learning, making them suitable for HL. Policymakers should consider student opinions and address their obstacles when formulating HL policies. Limited resources and awareness hinder student engagement, but collaborations and training can overcome these challenges. Socio-demographic factors have no impact on HL perception, showing universal enthusiasm. Discipline or faculty does not affect EHL, emphasizing shared interests and challenges.

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