

RESEARCH ARTICLE

THE FACTORS INDUCING UNDERGRADUATE ENTREPRENEUR SATISFACTION TOWARDS BLENDED LEARNING FOR ENTREPRENEURSHIP DEVELOPMENT IN SRI LANKA: A CASE STUDY AT UNIVERSITY OF COLOMBO INSTITUTE FOR AGRO-TECHNOLOGY AND RURAL SCIENCES

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ABSTRACT

Blended learning has become increasingly important in higher education, especially in the context of entrepreneurship education in Sri Lanka. Despite its relative novelty in the country's higher education context, this study explores into its impact on undergraduate entrepreneurs' satisfaction with blended learning at the University of Colombo Institute for Agro-Technology and Rural Sciences. This research seeks to identify the key determinants of satisfaction and improve the quality of blended learning experiences for undergraduate entrepreneurs at the institute, contributing to the ongoing advancement of entrepreneurship education in Sri Lanka. The study covers the entire population (204) of undergraduate entrepreneurs pursuing bachelor's degrees in Agro-Technology, ensuring a comprehensive perspective. To gather insights, a pre-tested questionnaire incorporating socio-economic information along with dimensions such as the learner, instructor, course, technology, design, environmental, and opportunity were used, and respondents were instructed to select the most appropriate answer on the Likert scale, which ranges from strongly agree to strongly disagree, to express their views. The study's results showed that in the blended learning context, dimensions such as the instructor, course, design, environmental, and opportunity were positively and significantly correlated with the satisfaction levels of undergraduate entrepreneurs. In contrast, the learner and technology dimensions did not demonstrate a significant correlation with satisfaction. Policymakers should be aware of these features and prioritise the improvement of Sri Lanka's higher education system, with a particular emphasis on entrepreneurial development.

Keywords: Blended learning, Entrepreneurship education, Higher education, Satisfaction, Undergraduate entrepreneurs

INTRODUCTION

Blended learning, the fusion of traditional and online education, is reshaping higher education, offering flexibility and personalization (Graham, 2006). It revolutionizes learning and fosters entrepreneurial opportunities (Ratten and Usmanij, 2021). For undergraduate entrepreneurs in blended learning, satisfaction relies on factors beyond typical educational content and delivery. Understanding these factors is critical. Researchers explored diverse aspects from teaching methods to technological skills, social interactions, and

course adaptability (Stefanic *et al.* 2019 and Lai *et al.* 2005). This exploration into undergraduate entrepreneur satisfaction in blended learning offers valuable insights for educators, administrators, entrepreneurs, and researchers in this evolving educational context.

In Sri Lanka, the integration of blended learning into higher education stands as a potential catalyst for transformation, yet the country hasn't fully embraced this pedagogical approach (Vithanapathirana, 2021; Hapuarachchi, 2016). This technology, widely successful in developed nations, hasn't

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strongly taken cause, rumbling concerns about the scarcity of entrepreneurship compared to similar countries (Tennakoon *et al.* 2020). Despite its pivotal role in national development, Sri Lanka's entrepreneurial ecosystem remains underdeveloped (Tennakoon *et al.* 2020; Hapuarachchi, 2016). Moreover, the lack of educational research on the blend of Blended Learning and entrepreneurship intensifies these issues, impacting the country's educational and economic context (Tennakoon *et al.* 2020; Hapuarachchi, 2016). Addressing this gap, this research aims to explore how Blended Learning can foster entrepreneurship in Sri Lanka, potentially revolutionizing both the education and entrepreneurial sectors. Establishing an effective blended learning system could lead to a new era of entrepreneurship, driving growth and progress in the country. Therefore, the primary goal of this study is to identify and explore the fundamental factors that influence the satisfaction levels of undergraduate entrepreneurs in the context of blended learning within the institute.

LITERATURE AND HYPOTHESIS

Blended Learning

Blended learning, synonymous with hybrid or mixed-mode education, merges conventional in-person teaching with digital learning tools. This approach combines various pedagogical practices to provide students with a versatile and flexible learning experience (Ali, 2018). Blended Learning's notable aspect is its adaptability. The study highlighted how students can access course materials at their own speed, facilitating personalized learning paths (Cassinadane *et al.* 2022). This flexibility is crucial for diverse learning styles, accommodating individual student needs. Learners can revisit content, explore extra resources, or progress faster through the curriculum based on their pace (Kundu *et al.* 2021). Blended learning goes beyond substituting traditional teaching with online materials; it integrates both to enrich the educational experience. Wut (2021) highlighted direct instructor-student interaction in physical classrooms, fostering discussions, collaborations, and immediate feedback. Ngoc

(2022) detailed how online elements encourage engagement through interactive exercises, peer discussions, and multimedia resources. This blend creates a comprehensive learning environment leveraging the strengths of both face-to-face and online interactions. Blended learning, noted by Ying (2017), enhances education's accessibility and convenience. Students can access materials and engage in discussions from anywhere with internet access. Naidu (2017) highlighted its benefit for busy individuals or those limited by geography, enabling education without constant physical presence. Entrepreneurs favour this approach as it allows studying while working, a key factor driving its popularity among them.

Theoretical framework

Various dimensions influence the satisfaction of undergraduate entrepreneurs with blended learning (Figure 1).

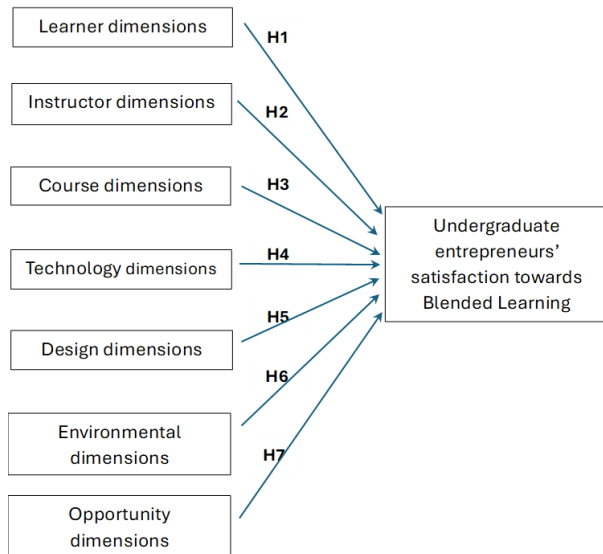


Figure 1: Effect of Different Dimensions for the Undergraduate Entrepreneurs' Satisfaction Towards Blended Learning

Learner dimensions

Learner dimensions, as highlighted by Chaw and Tang (2023), encompass various aspects like learning styles, prior experiences, motivation, digital skills, time management, and personal preferences. Recognizing how

these dimensions impact entrepreneur satisfaction in blended learning is crucial for educators and institutions. Tailoring instructional methods and support systems to accommodate diverse student needs can boost overall satisfaction and improve the effectiveness of entrepreneurship education in blended learning. This understanding enables continuous enhancement of blended learning programs to better cater to entrepreneurial learners' needs.

Hypothesis 1 (H1). Learner dimensions positively affect undergraduate entrepreneurs' satisfaction in blended learning.

Instructor dimensions

Instructors are pivotal in shaping the blended learning experience in entrepreneurship education, influenced by dimensions like teaching style, tech skills, communication, responsiveness, and creating a supportive environment. Recognizing how this impact entrepreneur satisfaction is crucial for institutions to train and support instructors effectively, catering to entrepreneurial students' needs and improving their blended learning satisfaction.

Hypothesis 2 (H2). Instructor dimensions positively affect undergraduate entrepreneurs' satisfaction in blended learning.

Course dimensions

Course dimensions in blended learning encompass components and attributes vital for undergraduate entrepreneurs. These dimensions impact satisfaction by catering to their needs, preferences, and professional aspirations, enhancing their educational experience. Quality, relevance, and up to date content are fundamental (De Waal *et al.* 2022). Gabia (2023) highlighted that a curriculum tailored to their needs enhances satisfaction. The course's organization and structure, including clear layouts with modules, objectives, and schedules, are preferences for entrepreneurs.

Hypothesis 3 (H3). Course dimensions positively affect undergraduate entrepreneurs' satisfaction in blended learning.

Technology dimensions

Technology dimensions impacting undergraduate entrepreneurs' satisfaction in blended learning involve various aspects of the technological setup, tools, and resources shaping their learning quality. Accessibility to online materials is crucial for easy access to lectures and resources, as highlighted by Arora (2019). Butcher and Curry (2022) noted that digital accessibility barriers, like restricted access or complex navigation, can diminish satisfaction. Frequent technical issues, as highlighted by Roff (2018), can lead to frustration and reduced satisfaction. User-friendly interfaces are essential, ensuring sensitive navigation for busy entrepreneurs (Zabramny, 2010). Additionally, compatibility, technical support, innovative tools, security, privacy, and scalability within the technological framework collectively strengthen overall satisfaction and the effectiveness of blended learning.

Hypothesis 4 (H4). Technology dimensions positively affect undergraduate entrepreneurs' satisfaction in blended learning.

Design dimensions

Design dimensions in blended learning for undergraduate entrepreneurs cover the structural and instructional aspects crucial for a course's effectiveness. A well-structured course with clear modules, objectives, and a logical sequence enhances understanding and satisfaction (Madleňák *et al.* 2021). The method of content delivery, be it videos, written materials, or interactive multimedia, significantly impacts satisfaction by aligning with entrepreneurs' preferences. Access to diverse and high-quality learning resources, including textbooks, articles, and supplementary materials, plays a vital role in supporting their learning and satisfaction (Kumar *et al.* 2021). Clearly defined and relevant learning objectives, as highlighted by Ozkan and Koseler (2009), help entrepreneurs align their goals, while practical examples and real-world applications enrich satisfaction by offering immediately applicable knowledge and skills, a point emphasized by McMullan and Long (1987).

Hypothesis 5 (H5). Design dimensions positively affect undergraduate entrepreneurs' satisfaction in blended learning.

Environmental dimensions

Environmental dimensions in blended learning for undergraduate entrepreneurs encompass various aspects beyond the virtual setting. These dimensions involve the physical, social, and cultural context in which learning occurs (Oliveira and Cassandre, 2023). A supportive and inclusive environment, as noted by Banerjee (2011), significantly enhances satisfaction and the overall effectiveness of blended learning. The physical learning environment, whether it's a home office or a traditional classroom, needs to be conducive to learning, free from distractions, and equipped with necessary resources and technology (Pan *et al.* 2023). Entrepreneurs' satisfaction can be influenced by the quality and comfort of their physical space. Reliable access to technology, including internet connectivity and devices, is crucial for their learning experience (Lorenzo, 2017). Limitations or disruptions in technology can negatively affect satisfaction. Additionally, the quality and accessibility of physical facilities required for classes or specific activities can impact satisfaction (Abduh *et al.* 2007). Well-equipped spaces like labs, libraries, or meeting areas may contribute to a positive experience (Nitecki, 2011). Cultural diversity and an inclusive atmosphere promoting collaboration and networking also play a significant role in enhancing satisfaction among entrepreneurial learners (Zadravec, 2021).

Hypothesis 6 (H6). Environmental dimensions positively affect undergraduate entrepreneurs' satisfaction in blended learning.

Opportunity dimensions

Opportunity dimensions in blended learning for undergraduate entrepreneurs encompass tailored advantages that cater to their specific needs and goals, significantly impacting satisfaction and the overall effectiveness of the learning experience. Blended learning offers flexible schedules, enabling students to

balance academic pursuits with business ventures (Levy and Rehm, 2016). This adaptability enhances satisfaction by meeting unique learning needs. The diverse range of learning resources such as online materials, in-person sessions, and practical tools provides entrepreneurs with extensive knowledge and skills (Lai *et al.* 2005). Collaborative opportunities fostered by blended learning, such as working with peers or mentors, lead to higher satisfaction (Dimitriadis and Koning, 2022). Additionally, blended learning's cost-effective solutions reduce educational expenses, a significant factor positively influencing satisfaction among entrepreneurial students (Salehi Omran and Salari, 2012).

Hypothesis 7 (H7). Opportunity dimensions positively affect undergraduate entrepreneurs' satisfaction in blended learning.

METHODOLOGY

Study location

The University of Colombo Institute for Agro-Technology and Rural Sciences has been a pioneer in adopting blended learning technology in Sri Lankan agricultural education. Since 2008, it has evolved into a leading institution within the University of Colombo, dedicated to advancing agricultural education. Focused on empowering entrepreneurial individuals in agriculture, it employs a Learning Management System (LMS) as the keystone of its teaching approach. This sophisticated system facilitates interactive learning, fostering collaboration between educators and students through digital resources, assignments, and discussions. By leveraging blended learning, the institute offers comprehensive agricultural education, covering sustainability and the latest advancements. This innovative approach positions them as a catalyst for aspiring entrepreneurs, revolutionizing agriculture education and fostering opportunities in Sri Lankan agricultural sector.

Study population

The study focuses on a unique group of agricultural entrepreneurs pursuing bachelor's

degrees in Agro-Technology. These individuals, drawn from diverse backgrounds in Sri Lankan agricultural sector, bring extensive experience and expertise. Unlike traditional undergraduates seeking jobs, they aim to innovate and lead in agriculture. Enrolling for higher education isn't about employment; it's a commitment to enhancing their skills, adopting modern practices, and contributing to agricultural growth. Their education investment reflects their dedication to advancing Sri Lankan agriculture, emphasizing their role as leaders and catalysts for change in the industry.

Data collection

The study collects data from the entire population of undergraduates pursuing a bachelor's degree in Agro-Technology, leaving no segment unaddressed. To ensure comprehensive information, the approach involves gathering both primary and secondary data. Primary data was collected through a thoroughly pre-tested survey questionnaire, voluntarily completed by the undergraduate population according to the international standards of human research ethics. The questionnaire was translated into the local language of Sinhala for ease of data collection. Secondary data were sourced from scholarly publications, research studies, and articles related to blended learning and undergraduate satisfaction, ensuring a comprehensive collection of information. During the defined time frame (December 2022) we successfully managed to assemble a strong and representative associate of 204 respondents for this study.

Questionnaire designing

The questionnaire used in the study covered socio-economic backgrounds and diverse dimensions relevant to assessing undergraduate entrepreneurs' satisfaction with blended learning. It employed a clear and straightforward approach, aligning with the research objectives. Seven dimensions were evaluated through items on a five-point Likert scale, allowing respondents to rate their agreement from strongly disagreed (-2) to strongly agreed (+2). The dimensions, indicators, and questions were structured

systematically to capture the varied aspects of satisfaction with blended learning.

Data analysis

The study ensured questionnaire strength by assessing reliability using Cronbach's alpha, aiming for a value above 0.70 to signify effective and consistent construct measurement. Pearson correlation analysis was employed to explore relationships between the seven dimensions, while the variance inflation factor (VIF) detected multicollinearity, with a VIF exceeding 10 requiring further investigation (Akintunde *et al.* 2021). This analysis was conducted to search deeper into how these dimensions collectively impacted undergraduate entrepreneurs' satisfaction in blended learning. IBM SPSS version 26 facilitated these analyses, allowing for precise and efficient statistical techniques, enabling comprehensive insights into the factors shaping satisfaction in blended learning for undergraduate entrepreneurs.

RESULTS

Socio Economic and demographic data

The research successfully gathered data from 204 participants. There were no missing values, as the survey design was carefully structured to prevent any data gaps. Table 1 provides an overview of the socio-demographic details of the respondents.

Instrument validation of blended learning satisfaction model

Mean, standard deviation and reliability analysis

Reliability analysis of the questionnaire's dimensions revealed Cronbach's alpha values ranging from 0.788 to 0.951 (Table 2). These values, falling within an acceptable range, align with established standards in research. Kilic (2016) supported an alpha value above 0.70 as acceptable, signifying strong internal consistency among the items within each dimension. This suggests that the items collectively measure the intended construct reliably and consistently.

Table 1: Socio Economic Background of the Respondents

Variable category	Variable levels	Frequencies	Percentages
Gender	Male	103	50.49%
	Female	101	49.51%
Age	Less than 20	0	0.00%
	21-30	125	61.27%
	31-40	63	30.88%
	41-50	16	7.85%
	Above 50	0	0.00%
Entrepreneurship field	Crop and livestock Farming	51	25.00%
	Agri processing and food industry	17	8.34%
	Agriculture consultancy	99	48.53%
	Agriculture education and training	30	14.70%
	Other	7	3.43%
Education qualification prior to enrollment of the degree	Less than GCE O/L	0	0.00%
	GCE O/L	2	0.98%
	GCE A/L	147	72.06%
	Diploma or Higher Diploma	55	26.96%
	Graduate	0	0.00%
	Postgraduate	0	0.00%
Level of study	1 st Year	12	5.88%
	2 nd Year	48	23.53%
	3 rd Year	82	40.20%
	4 th Year	42	20.59%
	Graduated	20	9.80%

Table 2: Mean, Standard Deviation and Reliability Analysis for the Selected Dimensions to Determine the Undergraduate Entrepreneur Satisfaction Towards Blended Learning

Dimension	Corresponding number of items	Cronbach's alpha values	Mean	SD
Learner dimensions	13	0.834	-0.26	0.393
Instructor dimensions	9	0.896	0.91	0.394
Course dimensions	10	0.884	0.87	0.387
Technology dimensions	6	0.788	0.59	0.446
Design dimensions	7	0.895	0.93	0.493
Environmental dimensions	14	0.914	0.85	0.399
Opportunity dimensions	8	0.878	0.75	0.451
Satisfaction (Dependent variable)	4	0.803	0.91	0.485

SD: Standard deviation

Investigating the undergraduate entrepreneurs blended learning satisfaction Correlation analysis between variables

The correlation analysis explored the relationships between seven dimensions and the satisfaction levels of undergraduate entrepreneurs in blended learning. The analysis highlighted significant connections

between dimensions and satisfaction (Table 3). The instructor dimension demonstrated a strong positive correlation (0.333**), emphasizing the impact of quality instruction on satisfaction. Similarly, the design dimension showed a strong correlation (0.333**) underlining the role of structured learning materials in shaping satisfaction.

Table 3: Pearson Correlation Coefficients and Significance Levels for the Selected Dimensions to Determine the Undergraduate Entrepreneur Satisfaction Towards Blended Learning

Dimensions		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Learner dimension	Pearson correlation	1							
	Sig. (2-tailed)								
Instructor dimension	Pearson correlation	-0.009	1						
	Sig. (2-tailed)	0.895							
Course dimension	Pearson correlation	-0.016	0.527**	1					
	Sig. (2-tailed)	0.820	0.000						
Technology dimension	Pearson correlation	0.034	0.212**	0.418**	1				
	Sig. (2-tailed)	0.631	0.002	0.000					
Design dimension	Pearson correlation	-0.052	0.550**	0.699**	0.351**	1			
	Sig. (2-tailed)	0.462	0.000	0.000	0.000				
Environmental dimension	Pearson correlation	-0.052	0.589**	0.705**	0.405**	0.746**	1		
	Sig. (2-tailed)	0.465	0.000	0.000	0.000	0.000			
Opportunity dimension	Pearson correlation	-0.047	0.423**	0.534**	0.306**	0.538**	0.716**	1	
	Sig. (2-tailed)	0.502	0.000	0.000	0.000	0.000	0.000		
Overall satisfaction towards BL	Pearson correlation	0.046	0.333**	0.329**	0.053	0.333**	0.313**	0.174*	1
	Sig. (2-tailed)	0.512	0.000	0.000	0.450	0.000	0.000	0.013	
	VIF	1.010	1.636	2.437	1.263	2.670	3.896	2.056	

** . Correlation is significant at the 0.01 level (2-tailed)

* . Correlation is significant at the 0.05 level (2-tailed)

1: Learner dimension, 2: Instructor dimension, 3: Course dimension, 4: Technology dimension, 5: Design dimension, 6: Environmental dimension, 7: Opportunity dimension, 8: Overall satisfaction towards Blended Learning

However, the opportunity dimension displayed a lower correlation (0.174**), indicating a weaker link between available opportunities and satisfaction among these entrepreneurs.

Multicollinearity

The VIF values calculated for the independent variables, ranging between 1 and 4 (Table 3), indicate an absence of significant multicollinearity issues. According to general guidelines and in line with James and Witten (2013), VIF values below 5 are deemed acceptable, signifying no substantial problems with multicollinearity. Hence, the data falls within an acceptable range, allowing for the continuation of statistical analysis without major concerns regarding multicollinearity.

DISCUSSION

Undergraduate entrepreneurs' satisfaction towards blended learning

The study evaluated the overall satisfaction of undergraduate entrepreneurs with blended learning (BL) by taking into account various factors such as the delivery mode of the degree program, the decision to pursue the

degree through blended learning, contentment with the time commitment required for the program, and the recommendation of the blended learning degree program. In terms of the delivery mode, a significant majority of entrepreneurs expressed a positive tendency (83.82%). Similarly, when considering the decision to select for the degree program through blended learning, the majority exhibited a positive outlook (85.29%). However, when assessing the factor of satisfaction with the time consumed by the degree program, a considerable proportion of respondents reported a negative sentiment (43.14%). Despite this, when examining the factor of recommending the degree program, a substantial majority provided a positive response (81.37%). Taking these responses into account, the overall satisfaction of undergraduate entrepreneurs with blended learning appears to be positive, with a satisfaction rate of 69.36%. The outcomes aligned with the discoveries of a study by Siriwardena *et al.* (2023), emphasizing that undergraduate students' satisfaction with blended learning was positively influenced by various factors at the institute.

Influence of learner dimension to undergraduate entrepreneur satisfaction towards blended learning

In the territory of entrepreneurship education, which is increasingly being offered through a blended learning approach, the dimensions of learners take on a significant role in moulding the overall satisfaction of students. The lack of a significant relationship between learner dimensions and blended learning satisfaction among undergraduate entrepreneurs implies that these characteristics may not strongly affect satisfaction in this context. This absence of impact could be due to the complexity of the learning environment and the influence of multiple factors. To comprehend student satisfaction in blended learning, it's crucial to examine various variables, suggesting that other factors might hold more sway in shaping satisfaction in this scenario. This outcome led to the rejection of Hypothesis 1.

In the context of assessing learner dimensions within a blended learning environment, it is essential to consider various factors that influence students' attitudes, experiences, and capabilities. The study conducted by Al-Busaidi in 2012 delves into these learner dimensions and highlights the significant contributions of three specific items: learner attitude toward blended learning, learner computer anxiety, and Learning Management System (LMS) self-efficacy.

In this research, high positive correlation values indicate the impact of certain factors on the blended learning experience. A correlation of 0.828 shows that a positive learner attitude significantly shapes the overall learning journey, leading to increased engagement and satisfaction with blended learning.

Another correlation of 0.588 highlights the influence of computer anxiety; students comfortable with technology tend to have smoother experiences as they face fewer technology-related challenges.

Additionally, a correlation of 0.452 suggests that higher self-efficacy with the Learning

Management System (LMS) enables students to better engage with course materials, collaborate effectively, and manage their learning within the blended environment.

Influence of instructor dimension to undergraduate entrepreneur satisfaction towards blended learning

In blended learning for entrepreneurship education, instructors act as a bridge between traditional and online learning. They play a crucial role in shaping the learning experience, fostering an inclusive environment, and developing both the entrepreneurial mindset and skill set. Their role goes beyond teaching; they serve as mentors, motivators, and guides, offering real-world insights that prepare students for the realities of entrepreneurship.

The correlation coefficient of 0.333 indicates a positive relationship between the instructor's role and the satisfaction of undergraduate entrepreneurs in blended learning. As scores related to the instructor dimension rise, so does the satisfaction of these students. This suggests a crucial role for instructors in shaping and improving student satisfaction, confirming the acceptance of Hypothesis 2.

It emphasizes the importance of effective teaching, support, and communication in creating a positive and engaging learning environment, ultimately leading to higher student satisfaction and potentially better educational outcomes for undergraduate entrepreneurs. Furthermore, the results from a study indicated a substantial impact of student-instructor interaction on undergraduates' perception of blended learning (Siriwardena *et al.* 2022).

In the context of instructor dimensions, the research study placed its primary focus on two essential elements: instructor assistant and instructor attitude toward blended learning. It was observed that both instructor assistant (0.930) and instructor attitude toward blended learning (0.823) exhibited a significant positive correlation with the instructor dimension concerning undergraduate

entrepreneur satisfaction in the context of blended learning.

The findings align with the discoveries made by Yang in 2023, which highlighted factors including the use of diverse evaluation methods, teaching proficiency, metacognitive self-regulation, and learning motivation as contributors that positively impact the satisfaction of undergraduate students in a blended learning setting. Additionally, Suprabha and Subramonian (2020) proved that blended learning instructional strategy could enhance the attitude towards learning and resulted in learning outcomes of higher secondary school students. A positive attitude towards blended learning signifies openness and enthusiasm that can be transmittable. Instructors who involve technology and effectively integrate online elements into their teaching can greatly enhance the overall learning experience. When students sense this enthusiasm, it often motivates them to engage more actively in online discussions, complete assignments, and collaborate with peers. This increased interaction tends to improve learning outcomes and overall satisfaction with the learning process.

Influence of course dimension to undergraduate entrepreneur satisfaction towards blended learning

The course dimension has a notable positive correlation coefficient of 0.329 with undergraduate entrepreneur satisfaction in blended learning. This correlation indicates that the structure and design of the course significantly impact student satisfaction. A well-organized, engaging course that meets learner needs, sets clear objectives, employs diverse assessment methods, and encourages active learning is likely to result in higher satisfaction among undergraduate entrepreneurs in a blended learning environment. This supports the acceptance of Hypothesis 3.

Within the scope of the course dimension, the research study specifically directed its attention to two core items: blended learning course flexibility and the quality of blended learning courses. Both the flexibility of

blended learning courses (0.811) and the quality of blended learning courses (0.874) display a significant and positive correlation coefficient with the course dimension.

The flexibility inherent in blended learning greatly influences course dimensions by fostering individualization, active learning, accessibility, and a positive learning environment. This flexibility aligns course dimensions with the diverse needs of students, enhancing the overall learning experience in a blended learning setting. These findings are supported by Liotsios and Demetriadis (2010), who highlighted the importance of engaging blended activities, appropriate media selection, and achieving balance between on-site and online activities in enhancing the effectiveness of blended course design.

The quality of blended learning courses has a substantial impact on course dimensions by ensuring they align with learning objectives, contain comprehensive content, encourage engagement and interaction, offer effective assessment and feedback, and maintain clear navigation. This study supports previous research emphasizing the importance of high-quality educational content that meets learning needs and fulfills the educational goals and objectives of the course for success (Gounopoulos *et al.* 2017).

Influence of technology dimension to undergraduate entrepreneur satisfaction towards blended learning

The lack of a significant correlation between technology dimensions and undergraduate entrepreneur satisfaction underscores the complexity of blended learning satisfaction. It implies that satisfaction is shaped by numerous factors, with technology playing a less pronounced role in this specific context. However, this finding suggests the institution should still prioritize understanding diverse technological needs and expectations of students, aiming to continuously improve the technological aspects of its blended learning model. This result led to the rejection of Hypothesis 4.

While prior research by Lai *et al.* (2005) and Kim (2022) found a significant impact of technology dimensions on undergraduate entrepreneur satisfaction in blended learning, the lack of such a relationship in the present study can be attributed to various contextual, methodological, and pedagogical differences. It emphasizes the need for institutions to tailor their approaches to technology integration and student support to best meet the unique needs and expectations of their student population in the ever-evolving context of blended learning. The study concentrated on technological elements, specifically technology quality and internet accessibility. Both factors showed significant positive correlation coefficients of 0.714 for technological quality and 0.782 for internet accessibility. Regarding technological dimensions and the satisfaction of undergraduate entrepreneurs in blended learning, Casanova and Moreira (2018) highlighted the need for a model assessing the quality of technology-enhanced learning in blended programs, emphasizing the critical evaluation and support for technology-enhanced learning as an invaluable complement to traditional face-to-face teaching. Additionally revealed the significance of internet accessibility within the scope of the technology dimension (Bayyat *et al.* 2021).

Influence of design dimension to undergraduate entrepreneur satisfaction towards blended learning

The design dimension has a substantial impact on satisfaction by ensuring that the design aligns with the unique learning needs, preferences, and goals of entrepreneurial students. The design dimension's significant positive correlation of 0.333 with undergraduate entrepreneur satisfaction in blended learning highlights the crucial role of course structure, visual appeal, alignment with learning objectives, interactivity, accessibility, usability, supportive resources, consistency, and pedagogical alignment in shaping overall student satisfaction.

A well-designed course accommodates diverse student needs, fosters active engagement, and offers a clear path toward

achieving educational goals, ultimately leading to heightened satisfaction among students. The findings align with Chen and Yao's (2016) research, emphasizing the crucial role of the design dimension as the primary influencer of perceived learner satisfaction in blended learning environments. Similarly, the design dimensions significantly enhanced students' perceptions of e-learning satisfaction, especially among farmers (Dhanushka *et al.* 2018). This supports the acceptance of Hypothesis 5.

The study focused on specific elements within the design dimension: the usefulness of the course design, language for blended learning design, and digital introduction in blended learning. These elements were identified as crucial components contributing to the overall course design in a blended learning environment.

Collectively, the findings suggest that these selected items, namely the usefulness of the course design (0.889), language for blended learning design (0.785), and digital introduction in blended learning (0.832), are highly valued by students and significantly contribute positively to the overall course design. Their strong positive correlation coefficients highlight their significance in shaping the design dimension and subsequently influencing student satisfaction in blended learning. Previous study emphasizes the significance of digital competence for successful implementation of blended learning, with areas such as information literacy, communication, and problem-solving being crucial (Bykova *et al.* 2021).

Influence of environmental dimension to undergraduate entrepreneur satisfaction towards blended learning

The positive and significant correlation (0.313) between the environmental dimensions and undergraduate entrepreneur satisfaction in blended learning signifies the crucial role that a supportive and conducive learning environment plays in enhancing students' overall contentment with their educational experience. This emphasizes the

significance of cultivating an environment that encourages student engagement and facilitates success in blended learning programs, confirming the acceptance of Hypothesis 6.

The study primarily focused on exploring key factors within the environmental dimensions that impact the satisfaction of entrepreneur undergraduates in blended learning. These factors, including perceived interaction with others, assessment diversity, interactivity of blended learning activities, and access to updated subject information, were carefully selected and examined to understand their influence on the overall learning experience. The strong positive correlation of 0.794 between learners' perceived interaction with others and the environmental dimension suggests that students who feel engaged and connected with their peers and instructors tend to perceive the learning environment as supportive and conducive. A study explored a blended synchronous learning environment and found that interactions between instructors and students in both online and face-to-face settings contributed to social presence experiences, which can enhance learning (Szeto and Cheng, 2014).

Next the strong positive correlation coefficient of 0.728 between diversity in assessment and the environmental dimension underscores the significance of providing a variety of assessment methods. This diversity reflects a dynamic and inclusive learning environment. Research examines the effectiveness of diverse blended learning setups in reaching learning goals, conducting assessments effectively, and employing formative assessments with teacher guidance to boost student engagement and enhance learning outcomes (Viegas *et al.* 2015).

Further, the substantial positive correlation of 0.845 between the interactivity of blended learning activities and the environmental dimension emphasizes the crucial role of interactive activities in shaping the learning environment. High interactivity in learning activities correlates with increased student engagement with course content and peers. Nguyen (2017) also highlighted the

significant influence of interactive activities on the dimensions of blended learning environments.

Finally, the strong positive correlation coefficient of 0.834 between access to updated subject information and the environmental dimension underscores the importance of maintaining current and relevant course content. Students who have access to the latest insights perceive the learning environment as progressive and attentive to their educational requirements. This aligns with previous studies emphasizing the necessity of using digital technologies to upgrade courses, enhancing accessibility, flexibility, and inclusivity in blended learning (Popescu, 2020).

Influence of opportunity dimension to undergraduate entrepreneur satisfaction towards blended learning

The positive and significant correlation (0.174) between opportunity dimensions and blended learning satisfaction among undergraduate entrepreneurs underscores the importance of providing students with a rich and diverse array of entrepreneurial opportunities within the learning environment. These opportunities not only enrich the educational experience but also contribute to the overall satisfaction of students, ultimately fostering their growth as entrepreneurs. This confirms the acceptance of Hypothesis 7.

The study focused on specific factors within the opportunity dimensions crucial to the satisfaction of undergraduate entrepreneurs. It investigated the impact of factors like external linkages, availability of financial resources, and opportunities for promoting higher education on the satisfaction levels of undergraduate entrepreneurs in blended learning settings. These aspects were deemed essential for understanding their influence on student satisfaction regarding blended learning.

The significantly strong positive correlation of 0.910 between the establishment of external linkages and the opportunity dimension highlights the crucial role of external connections in enriching the educational

experience of undergraduate entrepreneurs. These connections expand students' access to entrepreneurial opportunities and contribute to their development and satisfaction within blended learning environments. Tynan's (2013) findings align with this study, emphasizing the importance of external linkages in shaping the opportunity dimension in blended learning.

The positive correlation of 0.617 between the availability of financial resources and the opportunity dimension in blended learning indicates that students with access to financial resources in their program can better utilize the diverse opportunities offered by the institution. This enhances their learning experience, enabling engagement in a broader range of activities and initiatives, ultimately contributing to their satisfaction with the educational program. Financial resources serve as an enabler, expanding students' access to opportunities and advancing their educational journey. Previous research suggests that individuals with limited financial resources have restricted access to blended learning (Caird and Roy, 2019).

The significant positive correlation of 0.699 between the prospects for promoting higher education and the opportunity dimension in blended learning emphasizes the impact of educational pathways on the satisfaction of undergraduate entrepreneurs. Students' confidence in their program leading to future educational opportunities serves as motivation and contributes to their overall satisfaction with the learning experience. Garrison and Kanuka (2004) highlighted how blended learning holds the potential to bring transformative changes to higher education.

CONCLUSIONS

The study evaluated undergraduate entrepreneurs' satisfaction with blended learning across seven dimensions. Reliability analysis confirmed a strong measurement tool, with Cronbach's alpha values ranging from 0.788 to 0.951. Correlation analysis revealed significant positive links between instructors, course design, learning environment, and opportunities with

satisfaction. However, the learner and technology dimensions showed non-significant correlations. This suggests a need for a more balanced focus across all dimensions to enhance the blended learning program effectively.

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AUTHOR CONTRIBUTION

BPS conceptualized and designed the study, performed the experiment. BPS and LMA analyzed the data. LMA, ALS and NPV supervised the study. BPS and NPV drafted the manuscript and ALS critically revised the manuscript.

REFERENCES

- Abduh M, D'Souza C, Quazi A and Burley HT 2007 Investigating and classifying clients' satisfaction with business incubator services. *Managing Service Quality: An International Journal*, 17 (1), 74-91. <https://doi.org/10.1108/09604520710720683>
- Al-Busaidi KA 2012 Learners' perspective on critical factors to LMS success in blended learning: An empirical investigation. *Communications of the Association for Information Systems*, 30, 2. <https://doi.org/10.17705/1cais.03002>
- Ali W 2018 Transforming higher education landscape with hybrid/blended approach as an evolving paradigm. *Journal of Advances in Social Science and Humanities*, 3(7), 143-169. <https://doi.org/10.15520/jassh47334>
- Arora P 2019 Tech entrepreneurship: An experiential journey. *CUNY Academic Works*, 1-9. https://academicworks.cuny.edu/cc_oers/207/
- Aškerc Zadavec K 2021 Developing intercultural and entrepreneurship competences among students – the case of business, IT, and services disciplines. *SHS Web of Conferences*,

- 111, 01002. <https://doi.org/10.1051/shsconf/202111101002>
- Banerjee G 2011 Blended environments: Learning effectiveness and student satisfaction at a small college in transition. *Online Learning*, 15(1), 8-19. <https://doi.org/10.24059/olj.v15i1.190>
- BAYYAT M, ABU MUAILI ZH, and ALDABBAS L 2021 Online component challenges of a blended learning experience: A comprehensive approach. *Turkish Online Journal of Distance Education*, 277-294. <https://doi.org/10.17718/tojde.1002881>
- Butcher J and Curry G 2022 Digital poverty as a barrier to access. *Widening Participation and Lifelong Learning*, 24(2), 180-194. <https://doi.org/10.5456/wpll.24.2.180>
- Bykova TB, Ivashchenko MV, Kassim DA, and Kovalchuk VI 2021 Blended learning in the context of digitalization informatization. *CTE Workshop Proceedings*, 8, 247-260. <https://doi.org/10.55056/cte.236>
- Caird S and Roy R 2019 Blended learning and sustainable development. *Encyclopedia of Sustainability in Higher Education*, 107-116. https://doi.org/10.1007/978-3-030-11352-0_197
- Casanova D and Moreira A 2018 A model for discussing the quality of technology-enhanced learning in blended learning programmes. *Online Course Management*, 184-204. <https://doi.org/10.4018/978-1-5225-5472-1.ch010>
- Cassinadane A, Sivaramalingam J, Rajendiran K, Mohan M, Premlal K, Yadhav S, Satyamurthy, GV, Rangasamy S, Diravyaseelan M, Jamir L, Pandey DK, and Mohan S 2022 Effect of webinars in teaching-learning process in medical and allied health science students during COVID-19 pandemic: A cross-sectional study. *Journal of Education and Health Promotion*, 11(1), 274. https://doi.org/10.4103/jehp.jehp_1450_21
- Chaw LY and Tang CM 2023 Learner characteristics and learners' inclination towards particular learning environments. *Electronic Journal of e-Learning*, 21(1), 1-12. <https://doi.org/10.34190/ejel.21.1.2537>
- Chen WS and Tat Yao AY 2016 An empirical evaluation of critical factors influencing learner satisfaction in blended learning: A pilot study. *Universal Journal of Educational Research*, 4(7), 1667-1671. <https://doi.org/10.13189/ujer.2016.040719>
- De Waal GA and Maritz A 2022 A disruptive model for delivering higher education programs within the context of entrepreneurship education. *Education + Training*, 64(1), 126-140. <https://doi.org/10.1108/et-03-2021-0102>
- Dhanushka TGB, Siriwardena BP and Vidanapathirana NP 2018 Evaluation of e-Learning effectiveness for farmers: The relationship between user characteristics, design features and user satisfaction. *EDULEARN 18 Proceedings*, 6510-6515. <https://doi.org/10.21125/edulearn.2018.1552>
- Dimitriadis S and Koning R 2022 Social skills improve business performance: Evidence from a randomized control trial with entrepreneurs in Togo. *Management Science*, 68(12), 8635-8657. <https://doi.org/10.1287/mnsc.2022.4334>
- Garrison D and Kanuka H 2004 Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, 7(2), 95-105. <https://doi.org/10.1016/j.iheduc.2004.02.001>
- Gavia CC 2023 Curriculum and Instructional Assessment of the Bachelor of Technology and Livelihood Education Major in Home Economics Program. *European Journal of Innovation in Nonformal Education*, 3(7), 265-294. <https://www.inovatus.es/index.php/ejine/article/download/1909/1894>
- Gounopoulos E, Kontogiannis S, Valsamidis S and Kazanidis I 2017 Blended learning evaluation in higher education

- courses. *KnE Social Sciences*, 1(2), 385-389. <https://doi.org/10.18502/kss.v1i2.674>
- Graham CR 2006 Blended learning systems. In C. J. Bonk & C. R. Graham (Eds.), *The handbook of blended learning: Global perspectives, local designs* (Vol. 1, pp. 3-21). <https://media.kenanaonline.com/files/0036/36463/BLENDED%20LEARNING%20SYSTEMS.pdf>
- Hapuarachchi M 2016 Critical evaluation of existing theories and models in blended learning in higher education. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2909692>
- James G, Witten D, Hastie T and Tibshirani R 2013 *Statistical learning*. Springer Texts in Statistics, 15-57. https://doi.org/10.1007/978-1-4614-7138-7_2
- Kilic S 2016 Cronbach's Alpha reliability coefficient. *Journal of Mood Disorders*, 6(1), 47. <https://doi.org/10.5455/jmood.20160307122823>
- Kim Y 2022 A study on factors influencing University students' entrepreneurship intention: Focusing on experiential entrepreneurship education, information technology acceptance, and digital literacy. *The Korean Career, Entrepreneurship & Business Association*, 6(3), 133-160. <https://doi.org/10.48206/2022.6.3.133>
- Kumar A, Krishnamurthi R, Bhatia S, Kaushik K, Ahuja NJ, Nayyar A and Masud M 2021 Blended learning tools and practices: A comprehensive analysis. *IEEE Access*, 9, 85151-85197. <https://doi.org/10.1109/access.2021.3085844>
- Kundu A, Bej T and Rice M 2020 Time to engage: Implementing math and literacy blended learning routines in an Indian elementary classroom. *Education and Information Technologies*, 26(1), 1201-1220. <https://doi.org/10.1007/s10639-020-10306-0>
- Lai S, Lee C, Yeh Y and Ho C 2005 A study of satisfaction in blended learning for small and medium enterprises. *International Journal of Innovation and Learning*, 2(3), 319-334. <https://doi.org/10.1504/ijil.2005.006373>
- Levy D and Rehm M 2016 Blended learning: Best of both worlds. 25th Annual European Real Estate Society Conference. https://doi.org/10.15396/eres2016_edu_107
- Liotsios K and Demetriadis S 2010 'Going blended': Experiences from the implementation of blended learning design and the perspective of a model. *International Journal of Web Based Communities*, 6(1), 128-142. <https://doi.org/10.1504/ijwbc.2010.030021>
- Lorenzo AR 2017 Comparative study on the performance of Bachelor of Secondary Education (BSE) students in educational technology using blended learning strategy and traditional face-to-face instruction. *Turkish Online Journal of Educational Technology-TOJET*, 16(3), 36-46. <https://files.eric.ed.gov/fulltext/EJ1152658.pdf>
- Madleňák R, D'Alessandro SP, Marengo A, Pange J and Neszmélyi GI 2021 Building on strategic eLearning initiatives of hybrid graduate education a case study approach: MHEI-ME Erasmus+ project. *Sustainability*, 13(14), 7675. <https://doi.org/10.3390/su13147675>
- Mcmullan W and Long WA 1987 Entrepreneurship education in the Nineties. *Journal of Business Venturing*, 2(3), 261-275. [https://doi.org/10.1016/0883-9026\(87\)90013-9](https://doi.org/10.1016/0883-9026(87)90013-9)
- Naidu S 2017 Openness and flexibility are the norm, but what are the challenges? *Distance Education*, 38(1), 1-4. <https://doi.org/10.1080/01587919.2017.1297185>
- Ngoc NT 2022 How to make a virtual classroom more interactive. *Proceedings of the 4th Conference on Language Teaching and Learning*, 86-93. <https://doi.org/10.21467/proceedings.132.10>
- Nguyen VA 2017 The impact of online learning activities on student learning

- outcome in blended learning course. *Journal of Information & Knowledge Management*, 16(04), 1750040. <https://doi.org/10.1142/s021964921750040x>
- Nitecki DA 2011 Space assessment as a venue for defining the academic library. *The Library Quarterly*, 81(1), 27-59. <https://doi.org/10.1086/657446>
- Oliveira J and Cassandre M 2023 Learning to be an entrepreneur: Outlining aspects of social entrepreneurial learning at the university. *Contextus – Revista Contemporânea de Economia e Gestão*, 21, e81463. <https://doi.org/10.19094/contextus.2023.81463>
- Oyewale Akintunde M, Oludayo Olawale A, Simeon Amusan A and Ismail Abdul Azeez A 2021 Comparing two classical methods of detecting multicollinearity in financial and economic time series data. *International Journal of Applied Mathematics and Theoretical Physics*, 7(3), 62-67. <https://doi.org/10.11648/j.ijamtp.20210703.11>
- Ozkan S and Koseler R 2009 Multi-dimensional students' evaluation of E-learning systems in the higher education context: An empirical investigation. *Computers & Education*, 53(4), 1285-1296. <https://doi.org/10.1016/j.compedu.2009.06.011>
- Pan J, Cho TY, Sun M, Debnath R, Lonsdale N, Wilcox C and Bardhan R 2023 Future workspace needs flexibility and diversity: A machine learning-driven behavioural analysis of Co-working space. *PLOS ONE*, 18(10), e0292370. <https://doi.org/10.1371/journal.pone.0292370>
- Popescu A 2020 Essential aspects of blended learning. *Ovidius University Annals, Economic Sciences Series*, 20(1), 457-462. <https://stec.univ-ovidius.ro/html/anale/RO/2020/Section%203/33.pdf>
- Ratten V and Usmanij P 2021 Entrepreneurship education: Time for a change in research direction? *The International Journal of Management Education*, 19(1), 100367. <https://doi.org/10.1016/j.ijme.2020.100367>
- Roff KA 2018 Student satisfaction and/or dissatisfaction in blended learning environments. *Frontiers in Education Technology*, 1(2), 149. <https://doi.org/10.22158/fet.v1n2p149>
- Salehi Omran E and Salari Z 2012 Blended learning: A new approach in developing the teaching and learning process. *Education Strategies in Medical Sciences*, 5(1), 69-75. http://www.edcbmj.ir/browse.php?a_code=A-10-294-1&slc_lang=fa&sid=1&ftxt=1
- Siriwardena BP, Abeywickrama LM, Sandika AL and Vidanapathirana NP 2022 Freshmen's perceptions of blended learning in higher education: A case of University of Colombo Institute for Agro-Technology and Rural Sciences. <http://repository.kln.ac.lk/handle/123456789/25840>
- Siriwardena BP, Abeywickrama LM, Sandika AL and Vidanapathirana NP 2023 Freshmen's perspectives towards blended learning in Higher Education - A case study of the University of Colombo Institute for Agro-Technology and Rural Sciences. *AGRIEAST: Journal of Agricultural Sciences*, 17(2), 31-38. <https://doi.org/10.4038/agrieast.v17i2.125>
- Stefanic I, Campbell RK, Russ JS and Stefanic E 2019 Evaluation of a blended learning approach for cross-cultural entrepreneurial education. *Innovations in Education and Teaching International*, 57(2), 242-254. <https://doi.org/10.1080/14703297.2019.1568901>
- Suprabha K and Subramonian G 2020 Higher secondary school students' attitude towards blended learning instructional strategy. *International Journal of Indian Psychology*, 8(4). <https://ijip.co.in/index.php/ijip/article/view/2541>
- Szeto E and Cheng AY 2014 Towards a framework of interactions in a blended synchronous learning environment: What effects are there on students'

- social presence experience? *Interactive Learning Environments*, 24 (3), 487-503. <https://doi.org/10.1080/10494820.2014.881391>
- Tennakoon T, Gunawardena K and Premaratne S 2020 Challenges and constraints to enhance the entrepreneurship education in higher educational institutions of a developing country: Evidence from Sri Lanka. *Australian Journal of Business and Management Research*, 5(12), 13-26. <https://doi.org/10.52283/nswrca.ajbmr.20210512a02>
- Viegas C, Alves G and Lima N 2015 Formative assessment diversity to foster students engagement. 2015 International Conference on Interactive Collaborative Learning (ICL), 927-935. <https://doi.org/10.1109/icl.2015.7318152>
- Vithanapathirana M 2021 Blended learning as an emerging approach to teacher education in higher education in Sri Lanka: Lessons from a state-of-the-Art review. *University of Colombo Review*, 2(1), 61. <https://doi.org/10.4038/ucr.v2i1.39>
- Wut T and Xu J 2021 Person-to-person interactions in online classroom settings under the impact of COVID-19: A social presence theory perspective. *Asia Pacific Education Review*, 22(3), 371-383. <https://doi.org/10.1007/s12564-021-09673-1>
- Yang H, Ma M, Dong J, Chen Y, Li Q and Peng X 2023 A study of undergraduate students' learning satisfaction and influencing factors in blended learning. *Proceedings of the 2023 14th International Conference on E-Education, E-Business, E-Management and E-Learning*, 32-39. <https://doi.org/10.1145/3588243.3588262>
- Ying AN and Yang I 2016 Academics and learners' perceptions on blended learning as a strategic initiative to improve student learning experience. *MATEC Web of Conferences*, 87, 04005. <https://doi.org/10.1051/mateconf/20178704005>
- Zabramny M 2010 Designing digital experiences in an analog world. *Electronic Workshops in Computing*, 1-2. <https://doi.org/10.14236/ewic/create2010.18>