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RESEARCH ARTICLE

Exposing the Technological Acceptance Model in Blended Learning for Undergraduate Agricultural Entrepreneurs

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Abstract: Blended learning is advantageous not just in the student education system, but it is also well-suited to entrepreneurship education. The technological acceptance model is a valuable tool for determining the impact of external factors on technology intention. This study aims to identify the factors influencing undergraduate entrepreneurs' intentions to adopt blended learning technology. By analyzing these factors through the lens of the Technology Acceptance Model (TAM), we can gain a deeper understanding of how entrepreneurs perceive, and approach blended learning. The study commenced at the University of Colombo Institute for Agro Technology and Rural Sciences in Hambantota, Sri Lanka as the survey research method. All undergraduate entrepreneurs in the institute who work in Sri Lanka's agriculture industry were considered for the study as a population. Data was obtained from the entire population using a structured, pre-tested questionnaire. Regarding perceived usefulness of blended learning technology, job relevance demonstrated the strongest association, followed by result demonstrability, output quality, image, subjective norm, relative advantage, trialability, compatibility, and observability. Perceived ease of use in blended learning technology showed a strong positive correlation with perceived enjoyment, as well as with factors such as instructor assistance, computer literacy, language proficiency, trialability, self-efficacy, independence, and interaction. Both perceived ease of use and perceived usefulness of blended learning technologies were significant predictors of blended learning intention among undergraduate entrepreneurs, with a substantial positive relationship observed between the two. Additionally, blended learning intention was positively correlated with blended learning usage. This helps to design blended learning programmes that are not only successful but also easily adopted by agricultural entrepreneurs.

***Keywords**: Blended learning, Perceived usefulness, Perceived ease of use, Technological acceptance model and Undergraduate entrepreneurs.*

Introduction

The wide scope of information technology (IT) has significantly changed how we approach and perform through every part of work across professions. From communication and collaboration to data management and automation, IT has become an essential component of almost every concept and process, increasing efficiency and effectiveness in a variety of fields, particularly enterprise development (Wang, 2020, Wang, 2021). Blended learning is an important milestone in education, employing the power of information technology (IT) in order to effectively combine traditional teaching approaches with novel digital tools and resources (Fannakhosrow and Nourabadi, 2020). According to Vásquez Astudillo, (2020), this combination results in a varied and dynamic learning environment that maximizes the characteristics of both systems, particularly in higher education.

In Sri Lanka, new technologies are constantly emerging, yet many fail to survive over time. Prior to

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widespread deployment of a new technology, it is critical to determine its acceptance. However, research on the implementation of blended learning technology is very scarce, specially in Sri Lanka. Technological acceptance is critical for the successful adoption and implementation of new technologies such as virtual reality applications inside specific industries (Castiblanco Jimenez et al., 2021). This acceptance is determined by a variety of factors, including how individuals and organizations perceive, accept, and integrate new technology into their operations. Entrepreneur graduates have a critical role in driving a country's development, going beyond typical ideas of economic progress. These individuals, with an entrepreneurial attitude and skill set, make substantial contributions to social advancement, innovation, and long-term development (Jemal, 2020). While acknowledging the substantial benefits of blended learning in transforming undergraduate entrepreneurial education, there is a noticeable gap in understanding its acceptance, particularly among entrepreneurs in developing countries such as Sri Lanka. A study proved that blended learning presents issues in developing countries due to higher student and teacher populations and uneven technology use (Gaol and Hutagalung, 2020). For example, students studying law prefer social media and smartphone applications in blended learning technology (Selvaras, 2020). Given these considerations, the study aims to determine the amount of technological acceptability within the framework of blended learning among Sri Lankan undergraduate entrepreneurs. This emphasizes the necessity of incorporating blended learning into higher education pedagogy, particularly for entrepreneurs in the Sri Lankan industry sector.

Literature and hypothesis

Blended Learning

Blended learning is an educational strategy that combines traditional in-person teaching with digital learning (Kapur, 2020), bringing together various learning modalities such as physical lectures, web-based materials, online conversations, and multimedia content (Wahyuddin et al., 2020) This technique allows for a more adaptive and personalized learning path (Lin et al., 2020), leveraging the benefits of both physical teaching and digital resources to enhance the educational process (Abuhassna et al., 2022). Blended learning provides undergraduate entrepreneurs with a dynamic and flexible environment in which they may engage with course content both in regular classroom settings and online platforms (Almeida et al., 2020). It caters to their entrepreneurial needs by offering access to specialized resources (Graham, 2013), encouraging hands-on experiences (Poon, 2013), and building a collaborative learning environment (Al-Samarraie and Saeed, 2018). Blended learning in higher education establishments improves student engagement and retention, which leads to better job placements and the sustainability of higher education (Samuel, 2023).

Technological Acceptance Model (TAM)

TAM concentrates on fundamental concepts that are simpler to comprehend and apply, such as usefulness and ease of use. Because of TAM's robust research foundation, studies can be compared and benchmarked against one another. If the study concentrates on the opinions of specific users and does not require a comprehensive spectrum of factors influencing technology adoption, TAM might be adequate. However, context is important as well as UTAUT Models for more complex scenarios. As a result, TAM is the primary focus of the study rather than other models (Al-Qaysi et al., 2020, Blut et al., 2022).

The Technology Acceptance Model (TAM) is an empirical model used to explain and determine user acceptance and acceptance of technology (Davis, 1989). TAM seeks to explain individuals' behavioural intentions to use technology based on their perceptions (Hong et al., 2006). TAM has evolved over time to suit diverse contexts and technologies, resulting in modifications such as TAM2 (Venkatesh and Davis, 2000), TAM3 (Venkatesh and Bala, 2008), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), and many. TAM and its variations have helped to guide research, recognize user behaviour, and inform the development and execution of technology in a variety of fields and sectors. Figure 1 represents the final version of Technological Acceptance Model (TAM) by Venkatesh and Davis, (1996).

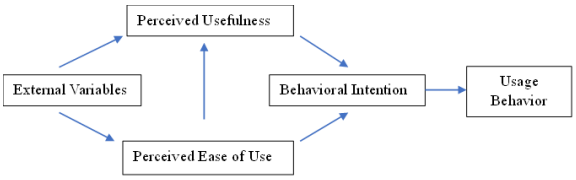

Figure 1. Final version of Technology Acceptance Model (TAM) Source: Venkatesh and Davis, (1996)

Research Model

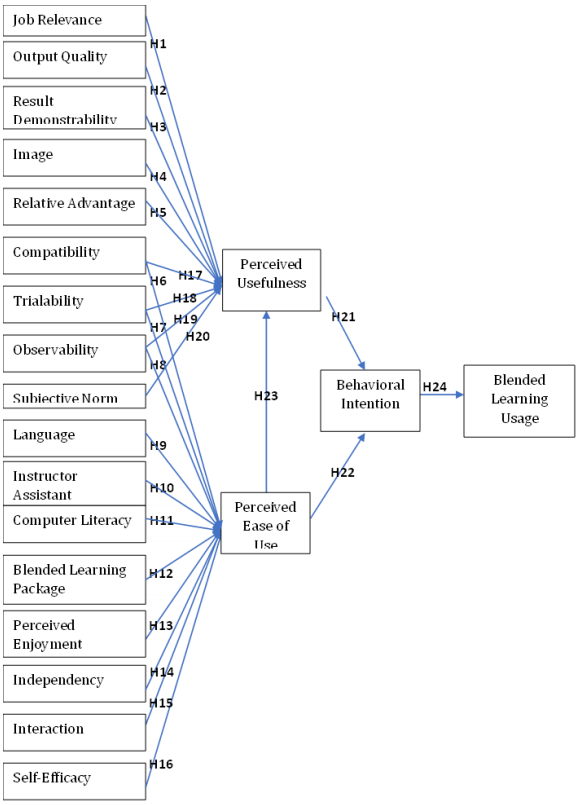

Figure 2. Research Model; External variables on Blended Learning Technological Acceptance Model (BLTAM) for undergraduate entrepreneurs

The Technology Acceptance Model (TAM) acknowledges that various external factors can significantly influence both perceived usefulness and perceived ease of use, as detailed in the following sections. This study adopted a framework that integrates the Technology Acceptance Model (TAM) with insights from external variables drawn from established theories. These theories include the Diffusion of Innovation (DOI) with its focus on factors like relative advantage, compatibility, observability, and trialability, and the Theory of Planned Behavior (TPB) with its emphasis on subjective norm (Al-Rahmi et al., 2019, Nadlifatin et al., 2020).

As mentioned in Figure 02, the following external variables can be discussed in the Blended Learning Technological Acceptance Model (BLTAM).

Job Relevance

Job relevance is the degree to which an individual considers technology as relevant or useful to their job or work responsibilities (Son et al., 2012). It is a factor that determines their assessment of the technology's effectiveness in their professional setting (Burleson et al., 2021). Individuals are more likely to regard technology as effective in increasing their job performance or achieving work-related goals when it is perceived to be job-relevant (Shamsi et al., 2021). Considering these factors, job relevance plays an important role in the perceived usefulness within the Technological Acceptance Model.

Hypothesis 1 (H1). Job relevance has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Output Quality

Output quality is one component that can influence the perception of usefulness. According to Wilkin, (2007), output quality relates to a user's belief that the output or results provided by a system are reliable, precise, and meet their expectations. When a system continuously produces high-quality outputs that meet or exceed user expectations, it improves perceived usefulness (Alkhawaja et al., 2022). Considering these factors, output quality is another variable determining perceived usefulness within the Technological Acceptance Model.

Hypothesis 2 (H2). Output quality has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Result Demonstrability

Result demonstrability refers to the degree to which the consequences or benefits of adopting technology are visible, observable, or easily proven to other individuals (Wang, 2022). When users can see or exhibit the favourable effects and benefits of utilizing technology, it improves their opinion of its usefulness (Soodan et al., 2024). According to Tabata and Johnsrud, (2008), result demonstrability plays a role in developing user attitudes and acceptance of technology by providing physical evidence of its worth and usefulness. The key consideration with result demonstrability is that the user feels comfortable sharing the benefits of the BL system with others and that the outcomes are recognizable. Thus, educators can raise the perceived value of blended learning and eventually raise student engagement and outcomes by emphasizing result demonstrability.

Hypothesis 3 (H3). Result demonstrability has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Image

The extent to which the adoption of an innovation is seen to elevate one's social status within their society or social system is referred to as its image (Marikyan and Papagiannidis, 2023). Image as a status on perceived usefulness emphasizes the social dimension in how people assess the utility or usefulness of a product or technology (Yi et al., 2006), taking into account not just its practical benefits but also how its use affects their social image or standing. This means that if students, instructors, or other stakeholders believe the blended learning system is reputable, trustworthy, and effective, they are more likely to find it beneficial and motivated to use it.

Hypothesis 4 (H4). Image has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Relative Advantage

Relative advantage influences perceived usefulness by emphasizing the benefits and advantages that the new technology provides over existing options (Kalumendo, 2022). Users are more likely to accept a technology that they believe to be much superior or more advantageous (Oliveira et al., 2014). Thus, highlighting the relative benefits of blended learning can improve entrepreneurs' perceptions of its utility.

Hypothesis 5 (H5). Relative advantage has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Compatibility

Compatibility has a significant impact on perceived ease of use by lowering cognitive load, aligning with user goals and expectations, and integrating easily into current systems (Hariyanto et al., 2022). Technologies that are tailored to user preferences and environments are more likely to be regarded as user-friendly and simple to utilize. Compatibility influences perceived usefulness in determining how well new technology integrates into the current setting, both in terms of technical characteristics and user preferences (Alamri, 2022). When technology seamlessly integrates with existing systems, requirements, and values, consumers perceive it as more valuable and are more likely to accept it (Shahid et al., 2021). Furthermore, Ullah et al., (2021) state that compatibility has a substantial impact on the ease of adoption and integration, eventually influencing users' judgments of the technology's utility and usefulness. As such, the acceptance and usefulness of blended learning systems are greatly influenced by compatibility.

Hypothesis 6 (H6). Compatibility has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM).

Hypothesis 17 (H17). Compatibility has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Trialability

Trialability indicates perceived usefulness and simplicity of use by allowing consumers to explore and try the technology before fully committing (Jiao et al., 2020). This hands-on experience reduces anxiety about risks (Weerakkody et al., 2017), promotes learning, and enables users to make more informed decisions about the usefulness of technology in their particular setting (Jiao et al., 2020). Through this practical experience, users can evaluate how well the system fits their needs and how simple it is to incorporate into their teaching or learning processes.

Hypothesis 7 (H7). Trialability has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Hypothesis 18 (H18). Trialability has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Observability

Observability has a major impact on perceived ease of use since it provides observable, tangible, and confirmable outcomes when utilizing technology (Arkorful et al., 2022). Observability refers to the degree to which the outcomes or benefits of employing a technology are noticeable or easily observed by others (Aizstrauta et al., 2015). Observability increases its perceived usefulness by demonstrating the technology's benefits (Singh et al., 2020). The study focuses on aspects such as outcomes visibility and easily observable results under the observability category. When others can easily observe and appreciate the beneficial effects or results of employing technology, the impression of its usefulness improves, which leads to its acceptance and adoption.

Hypothesis 8 (H8). Observability has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Hypothesis 19 (H19). Observability has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Subjective Norm

When perceived usefulness focuses on an individual's view of the technological practical benefit (Eze et al., 2021), subjective norm emphasizes the social forces that impact this opinion (Wan et al., 2017). When significant individuals convey good judgments about the usefulness of technology, it can have an indirect impact on an individual's perception of its usefulness, adding to the overall assessment of its usefulness (Liu et al., 2020) So, social pressure and encouragement have the power to profoundly alter people's perspectives and raise their inclination to accept and use the blended learning model.

Hypothesis 20 (H20). Subjective norm has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Language

Language has a significant impact on perceived ease of use by impacting understanding, accessibility, advice, and overall user experience (Lu et al., 2022). Clear, comprehensive, and consistent terminology can help users observe a system as straightforward and comfortable to use. Unfamiliar or complicated language might cause obstacles and make the system seem more difficult to use.

Hypothesis 9 (H9). Language has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Instructor Assistant

Instructor assistants contribute to perceived ease of use by offering personalized, adaptable, and supportive advice (Morra et al., 2022). Their capacity to expedite interactions, automate activities, and provide rapid support helps consumers see the technology as simple and natural to use (Winkler et al., 2021). Because of this, the availability of encouraging teachers can have a significant impact on how well users engage with and gain from the blended learning environment.

Hypothesis 10 (H10). Instructor assistant has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Computer Literacy

Computer literacy has a considerable impact on perceived ease of use (Jameel et al., 2022), as it improves users' capacity to interact with and adapt to various technologies. According to Katsarou, (2021), people with higher levels of computer literacy are better able to understand new systems and technologies. On the other hand, people with less computer literacy can find it harder to operate the technology components of the blended learning system, which could give the impression that it is more difficult.

Hypothesis 11 (H11). Computer literacy has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Blended Learning Package

A well-constructed blended learning package that integrates various materials, allows flexibility, and user-friendly technology (Li et al., 2022) and noted that blended learning (Huang, 2021) packages serve individual learning needs and can have a major impact on perceived ease of use. Thus, the quality and usability of the blended learning package are critical in determining how easily users can interact with and benefit from the system.

Hypothesis 12 (H12). Blended learning package has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Perceived Enjoyment

Perceived enjoyment has a significant impact on perceived ease of use by encouraging positive reactions (Li et al., 2021), increasing willingness to participate, lowering learning barriers, and improving overall user satisfaction (Moreira et al., 2022). Furthermore, Jo, (2022) stated that when consumers discover a system engaging, they are more likely to perceive it as easy and comfortable to use, regardless of potential complications or learning curves. If the blended learning environment includes components that users enjoy or value, such as interactive activities, gamification, or interesting content, it can improve their overall experience and make the system appear more user-friendly.

Hypothesis 13 (H13). Perceived enjoyment has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Independency

Independence in using a system or technology has a substantial impact on perceived ease of use (Gefen and Straub, 2000). Whenever users perceive that they are capable and encouraged to use technology despite frequent external support, their impression of the system's usability improves (Istiqomah and Suminar, 2019). So, when a system is structured to allow users to accomplish activities and access resources on their own, their perception of ease of use improves.

Hypothesis 14 (H14). Independency has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Interaction

Interaction is critical in determining the perceived ease of use of a system or technology (Ojeda-Castelo (Ojeda-Castelo et al., 2021). A carefully constructed interaction design meets users' expectations, gives direction, and timely feedback, and empowers users to control their interactions, all of which contribute to a more positive opinion of the ease of use by the system (Sun, 2022). Thus, strong and user-friendly interaction elements play an important role in determining perceived ease of use in blended learning environments.

Hypothesis 15 (H15). Interaction has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Self-Efficacy

Self-efficacy has a significant impact on perceived ease of use (Malureanu et al., 2021), as it influences users' confidence, approach to learning, desire to invest effort, and adaptability to new technologies (Xu et al., 2022). Individuals with greater levels of self-efficacy regard technologies as more user-friendly and simpler to operate because they believe they can effectively interact alongside and manage these systems (Henkens et al., 2021). Fostering a sense of self-efficacy among users can improve their perceived ease of use in blended learning environments.
Hypothesis 16 (H16). Self-efficacy has a significant effect on perceived ease of use in Blended Learning Technological Acceptance Model (BLTAM)

Perceived Usefulness

Perceived usefulness is an individual's subjective assessment or perception that employing a specific technology, system, or innovation will improve job performance, productivity, and effectiveness, or make activities easier to complete (Van Nhi and Lam, 2019), 2020). It is an important idea in technology acceptance theories, such as the Technology Acceptance Model (TAM). Perceived usefulness has a substantial impact on users' attitudes and intentions to accept and use technology (Karunarathne and Abeyratne, 2020). If consumers believe that a technology will improve their performance or make activities easier, they are more inclined to adopt and use it.
Hypothesis 21 (H21). Perceived usefulness has a significant effect on behavioral intention in the Blended Learning Technological Acceptance Model (BLTAM)

Perceived ease of use

Perceived ease of use reflects a person's subjective estimate of how simple or easy to use a technology or system should appear when they interact with it (Kim et al., 2021). A system that is considered simple to use is more likely to be adopted and used by users, resulting in favourable user experiences and overall technology acceptance (Baby and Kannammal, 2020) . Thus, a major determinant of user intents to integrate blended learning into their regular academic routines is perceived ease of use.
Hypothesis 22 (H22). Perceived ease of use has a significant effect on behavioral intention in Blended Learning Technological Acceptance Model (BLTAM)
Hypothesis 23 (H23). Perceived ease of use has a significant effect on perceived usefulness in Blended Learning Technological Acceptance Model (BLTAM)

Behavioural Intention

Behavioural intention has a considerable influence on the actual use of blended learning tools. A favourable intention to use these resources is a strong predictor of individuals' behaviour in utilizing the accessible learning modalities within the blended learning framework (Anthony et al., 2023). A high level of behavioural intention frequently translates into real usage, as users are encouraged to carry out their goals and incorporate the blended learning system into their daily routine.Hypothesis 24 (H24). Behavioral intention has a significant effect on blended learning usage in Blended Learning Technological Acceptance Model (BLTAM)

Methodology

Survey research is a suitable method to test the Technology Acceptance Model (TAM) adoptability by undergraduate entrepreneurs regarding blended learning technology for several reasons such as cost-effectiveness, scalability, standardization, anonymity and focus on specific constructs (Alsharida et al., 2021). The research was carried out at the University of Colombo Institute for Agro Technology and Rural Sciences in Hambantota, Sri Lanka. This institute is well-known for its bachelor's degree programme in Agro Technology, which is targeted to the agricultural entrepreneurs in Sri Lanka. The program's notable characteristic is its use of blended learning. The institute successfully employs a Learning Management System (LMS), which allows undergraduate entrepreneurs to participate in a virtual

Table 1. Mean and standard deviation of blended learning technological acceptance model

Variable	No of Items	Mean	Std. Dev.
Job Relevance	3	1.13	0.577
Output Quality	2	0.69	0.724
Result Demonstrability	4	0.75	0.509
Image	3	0.75	0.628
Relative Advantage	4	0.80	0.642
Compatibility	2	0.87	0.655
Trialability	2	0.76	0.612
Observability	2	0.72	0.705
Computer Literacy	3	0.47	0.560
Language	3	0.16	0.767
Instructor Assistant	3	0.79	0.582
Subjective Norm	2	0.40	0.671
Blended Learning Package	3	0.66	0.845
Perceived Enjoyment	4	0.89	0.567
Independency	3	0.80	0.687
Interaction	3	0.79	0.789
Self-efficacy	4	0.29	0.700
Perceived Usefulness	4	0.89	0.551
Perceived Ease of Use	4	0.74	0.494
Behavioral Intention on Blended Learning	3	1.18	1.066
Blended Learning Usage	4	0.54	0.529

component in addition to traditional in person teaching techniques, and these entrepreneur undergraduates were included in the study population. Their role goes beyond the usual educational paradigm, as they generate job producers rather than job seekers. This differentiation is critical in agricultural development inside a country. By fostering agricultural entrepreneurs, this institute serves as a basis for driving the nation's advancement in agriculture. These people are prepared not just to seek possibilities, but also to create them, supporting growth, innovation, and sustainability in the agricultural sector, and therefore significantly influencing the country's overall development and advancement. Using Google forms, the data collection technique included all members of the population, resulting in an extensive and effective study. Data collecting may be extremely crucial and demand the highest level of accuracy therefore we used the entire population and obtained 204 respondents. This study used the deductive survey research strategy, collecting primary data via a pre-tested structured questionnaire. The actual questionnaire was changed after addressing the comments from preliminary questionnaire. Along with this primary data, additional information was gathered from published literature, increasing the study's completeness and scope. In addition to collecting the information on respondent's overall status, the questionnaire was created with some close ended questions into the theoretical framework of the research to include a variety of characteristics such as the perceived usefulness and perceived ease of use by the entrepreneurs to determine intention on blended learning. Originally the questionnaire was designed in English language and then it was translated to local language of Sinhala with help from a translator. Data were carefully collected using a five-point Likert Scale, which provided a range of responses from strongly disagreed (-2) to strongly agreed (+2). This scale (-2: Strongly Disagree; -1: Disagree; 0: Neutral; +1: Agree; +2: Strongly Agree) provides respondents with enough distinct options to accurately reflect the intensity of their agreement or disagreement with each statement. The data was analyzed using the Statistical Package for Social Science (SPSS) version 26.

A statistical technique called structural equation modelling (SEM) is used to evaluate and calculate causal correlations between variables. Factor analysis and multiple regression analysis components are combined in this multivariate statistical technique. Researchers can examine intricate connections between observable and latent (unobserved) variables using SEM. It can be applied to verify hypotheses, test theoretical models, and investigate the direct and indirect effects of one variable on another. Structural Equation Modelling (SEM) analysis is commonly performed using the software programme Analysis of Moment Structures (AMOS). Model definition, estimation, assessment, and interpretation are all supported by AMOS, which also has an intuitive user interface for SEM analysis and a number of features.

Results and discussion

Demographic characteristics

The ages of the survey participants were divided into five categories: less than 20 years (0%), 21-30 years (61%), 31-40 years (31%), 41-50 years (8%), and over 50 years (0%). Males accounted for 50.49% of undergraduate entrepreneurs, while females made up 49.51%. The respondents were divided into five entrepreneurship categories such as crops and livestock farming (25%), agro processing and food industry (8%), agriculture consultancy (49%), agriculture education and training (15%), and "Other" (3%).

Measurement model

Covariance-Based SEM (CB-SEM) examines the covariance matrix of observed data to estimate the associations between variables. It anticipates that the relationships between variables are linear and regularly distributed. Confirmatory factor analysis is a statistical method based on theoretical expectations or prior assumptions that is used to evaluate and validate the structure of a measurement model by analyzing the links between latent variables (factors) and observed variables (indicators) (Afandi et al., 2023).When assessing how well the model fits the observed data, model misfit indices and goodness-of-fit indices are used to evaluate the overall fit of the model. Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) are considered as the model misfit indices. Additionally, $\chi 2$/df, Normed Fit Index (NFI) and Comparative Fit Index (CFI) were considered as the goodness of fit indices of the model (Goretzko et al., 2024).

Data screening and normality test

Participants were requested to provide feedback using a five-point Likert scale, with responses ranging from -2 (strongly disagree) to +2 (strongly agree). Table 1 displays the mean values of all items, which fell within a response range of 0.29 to 1.18, indicating general agreement with the statements. Additionally, the standard deviations of the responses varied from 0.494 to 1.066. In summary, the average response from undergraduate entrepreneurs suggests a positive attitude towards technological acceptance statements.

Reliability and convergent validity

IBM SPSS AMOS 26 was used to assess the study model, and a confirmatory factor analysis was used to validate all construct reliability, discriminant validity, and convergent validity. Table 2 illustrates that the Cronbach's alpha (ranging from 0.712 to 0.958), Composite reliability (from 0.750 to 0.968), factor loading (from 0.490 to 0.968), and Average variance extracted (AVE) values (from 0.376 to 0.883) for each construct used in the study model are all within an acceptable range (Lessa et al., 2021, Utami and Siswanto, 2021). As a result, there is significant internal consistency and reliability in the research model.

Discriminate validity

According to the criteria established by Fornell and Larcker, (1981), this study supports good discriminant validity (AVEs of individual constructs > correlations between variables), as shown in table 3.

Model fit

As mentioned in Table 4, model fit indices are used to estimate the research model. Different indices were used as mentioned below and all indices were in the acceptable range on this research model. Thus, results indicate a good model fit of the study.

Tests of hypotheses

Perceived Usefulness

Various blended learning parameters influenced the perceived usefulness in the proposed technological acceptance paradigm. The positive association (regression coefficient = 0.501; $p < 0.001$) between job relevance and perceived usefulness fosters a more committed and inspired learner, enables the practical use of information and abilities, and eventually adds to career success and progress a (Almulla, 2022), . A study also found that job relevance increases acceptance of the E-learning system (Siriwardena et al., 2018). Furthermore, Samuel, (2023) acknowledged, recognized, and emphasized the link between blended learning and employment relevance, which increases the perceived usefulness of the educational program. Hypothesis 1 was accepted.

There was a direct and positive association (regression coefficient = 0.291; $p < 0.01$) between output quality and how users view the system's usefulness and value in the field of entrepreneurship. This information can help decision-makers allocate resources to improve output quality, resulting in higher user satisfaction and perceived usefulness (Xu et al., 2022). Hypothesis 2 was accepted. The positive association between result demonstrability and perceived usefulness (regression coefficient = 0.412; $p < 0.001$) is critical for entrepreneurs in blended learning, such as product designers and developers (Fu, 2022). Hypothesis 3 was accepted, as emphasizing clear, accessible, and user-friendly examples of demonstratable positive outcomes can considerably contribute to user satisfaction and system success (Wen et al., 2016). Image on blended learning correlates strongly with perceived usefulness (regression coefficient = 0.281; $p < 0.01$). Image is a multifaceted, interdisciplinary notion that society uses to identify individuals, including reputation (Karbovska, 2023).

Table 2: Reliability and convergent validity statistics of technological acceptance model

Construct	Item	α Cronbach's alpha	Composite Reliability (CR)	Factor loading	AVE
Job Relevance	JR1	0.867	0.940	0.790	0.685
	JR3			0.879	
	JR2			0.811	
Output Quality	OQ1	0.760	0.841	0.868	0.629
	OQ2			0.711	
Result Demonstrability	RD1	0.863	0.946	0.797	0.611
	RD4			0.770	
	RD2			0.730	
	RD3			0.826	
Image	IM1	0.869	0.931	0.842	0.692
	IM3			0.774	
	IM2			0.877	
Relative Advantage	RA1	0.712	0.750	0.503	0.376
	RA4			0.668	
	RA3			0.686	
	RA2			0.578	
Compatibility	CO1	0.820	0.906	0.781	0.703
	CO2			0.892	
Trialability	TR1	0.816	0.911	0.835	0.694
	TR2			0.831	
Observability	OB1	0.849	0.908	0.865	0.738
	OB2			0.853	
Subjective Norm	SN1	0.758	0.929	0.725	0.589
	SN2			0.808	
Language	LA1	0.817	0.851	0.672	0.603
	LA3			0.773	
	LA2			0.871	
Instructor Assistant	IA1	0.821	0.914	0.567	0.628
	IA3			0.901	
	IA2			0.867	
Computer Literacy	CL1	0.742	0.877	0.593	0.518
	CL3			0.830	
	CL2			0.717	
Blended Learning Package	BP1	0.863	0.877	0.831	0.683
	BP3			0.774	
	BP2			0.871	
Perceived Enjoyment	PE1	0.845	0.928	0.647	0.595
	PE4			0.761	
	PE2			0.781	
	PE3			0.879	
Independency	IND1	0.853	0.896	0.957	0.644
	IND3			0.795	
	IND2			0.619	
Interaction	INT1	0.809	0.830	0.686	0.588
	INT3			0.833	
	INT2			0.775	
Self-efficacy	SE1	0.816	0.858	0.669	0.532
	SE4			0.678	
	SE3			0.812	
	SE2			0.748	
Perceived Usefulness	PU1	0.937	0.940	0.891	0.790
	PU4			0.838	
	PU3			0.904	
	PU2			0.920	
Perceived Ease of Use	PEU1	0.831	0.968	0.670	0.576
	PEU4			0.874	
	PEU3			0.838	
	PEU2			0.623	
Behavioral Intention	BI1	0.958	0.948	0.968	0.883
	BI3			0.925	
	BI2			0.926	
Blended Learning Usage	BLU2	0.812	0.929	0.865	0.543
	BLU3			0.708	
	BLU4			0.490	
	BLU1			0.827	

Table 3. Discriminate validity of the Technological Acceptance Model

	JR	OQ	RD	IM	RA	CO	TR	OB	CL	LA	IA	SN	BP	PE	IND	INT	SE	PU	PEU	BI	BLU
Job Relevance (JR)	**(.83)**																				
Output Quality (OQ)	.47**	**(.79)**																			
Result Demonstrability (RD)	.36**	.45**	**(.78)**																		
Image (IM)	.38**	.27**	.48**	**(.83)**																	
Relative Advantage (RA)	.32**	.33**	.43**	.32**	**(.61)**																
Compatibility (CO)	.40**	.44**	.44**	.36**	.42**	**(.84)**															
Trialability (TR)	.29**	.37**	.49**	.35**	.32**	.48**	**(.83)**														
Observability (OB)	.24**	.42**	.44**	.31**	.31**	.40**	.36**	**(.86)**													
Computer Literacy (CL)	.19**	.12	.20**	.16*	.16*	.11	.11	.22**	**(.77)**												
Language (LA)	-.01	-.01	-.05	.05	-.04	.00	-.09	.06	.43**	**(.78)**											
Instructor Assistant (IA)	.30**	.24**	.43**	.43**	.18*	.36**	.32**	.34**	.41**	.14*	**(.79)**										
Subjective Norm (SN)	.27**	.32**	.37**	.45**	.24**	.26**	.26**	.48**	.26**	.26**	.46**	**(.72)**									
Blended Learning Package (BP)	.11	.32**	.39**	.32**	.18*	.28**	.33**	.27**	.19**	.10	.36**	.36**	**(.83)**								
Perceived Enjoyment (PE)	.44**	.58**	.58**	.52**	.41**	.66**	.61**	.46**	.18**	.08	.57**	.43**	.45**	**(.77)**							
Independency (IND)	.31**	.34**	.37**	.45**	.26**	.49**	.42**	.37**	.18*	-.05	.41**	.39**	.22**	.60**	**(.80)**						
Interaction (INT)	.12	.13	.15*	.11	.08	.18*	.06	.16*	.08	-.02	.11	.11	-.02	.22**	.10	**(.77)**					
Self-Efficacy (SE)	.08	.10	.15*	.31**	.10	.17*	.20**	.33**	.29**	.23**	.17*	.51**	.29**	.15*	.26**	.10	**(.73)**				
Perceived Usefulness (PU)	.62**	.40**	.51**	.48**	.41**	.51**	.38**	.33**	.29**	.12	.49**	.40**	.33**	.63**	.49**	.19**	.24**	**(.89)**			
Perceived Ease of Use (PEU)	.42**	.50**	.51**	.58**	.54**	.55**	.54**	.44**	.21**	.04	.36**	.40**	.35**	.72**	.51**	.10	.29**	.66**	**(.76)**		
Behavioral Intention (BI)	.43**	.39**	.41**	.38**	.35**	.44**	.32**	.37**	.18*	.00	.27**	.28**	.17*	.50**	.36**	.19**	.25**	.56**	.63**	**(.94)**	
Blended Learning Use (BLU)	.24**	.43**	.43**	.47**	.31**	.44**	.44**	.52**	.18*	.09	.36**	.51**	.42**	.59**	.48**	.15*	.34**	.45**	.62**	.39**	**(.74)**

(The bold diagonal values are the square roots of the AVEs of the individual constructs and off diagonal values are the correlations between constructs)

Table 4 Fit indices for blended learning technological acceptance model

Fit index	Value	Recommended Value
χ 2/df	1.342	< 5.00 (Chaves et al., 2023)
Root Mean Square Error of Approximation (RMSEA)	0.041	< 0.08 (Chaves et al., 2023)
Comparative Fit Index (CFI)	0.808	< 0.90 (Chaves et al., 2023)
Tucker-Lewis Index (TLI)	0.927	Closer to 1 (Tucker and Lewis, 1973)
Standardized Root Mean Square Residual (SRMR)	0.048	< 0.08 (Chaves et al., 2023)
Normed Fit Index (NFI)	0.941	> 0.90 (Saylan and Cinaroglu, 2023)
Relative Fit Index (RFI)	0.763	Closer to 1 (Bollen, 2014)
Incremental Fit Index (IFI)	0.943	Closer to 1 (Bollen, 2014)

Using images to indicate people's status in blended learning can improve participants' opinions of the pedagogical strategy's usefulness. Hypothesis 4 was accepted. The positive association (regression coefficient = 0.243; $p < 0.05$) between the relative advantage of blended learning and perceived usefulness highlights the need of emphasizing blended learning's distinct characteristics. Highlighting the benefits of flexibility, personalization, technological integration, and various instructional materials can help to create a positive and effective blended learning experience (Abuhassna et al., 2022). Hypothesis 5 was accepted.

Butnariu, (2021) explained that preserving compatibility in blended learning requires knowing and adapting to learners' different requirements, preferences, and abilities. When blended learning has been tailored to fully align with these variables, learners have good perceptions of usefulness (regression coefficient = 0.215; $p < 0.05$), which contributes to a successful and effective learning experience. Hypothesis 17 was accepted.

The ability to try or experience blended learning before completely committing to it can have a beneficial impact on their assessment of its usefulness (regression coefficient = 0.236; $p < 0.05$). Trialability in blended learning can be a deliberate strategy to improving learners' perceptions of usefulness. Eventually enhancing the learning approach's effectiveness and success. Hypothesis 18 was accepted.

Observability in blended learning has a significant impact on learners' judgements of its utility (regression coefficient = 0.165; $p < 0.05$). Providing visual proof of beneficial outcomes, real-world applications, and success stories helps to create more accessible and relatable stories, creating a positive attitude towards blended learning (Ó Ceallaigh, 2021). Hypothesis 19 was accepted.

The positive relationship between subjective norm and perceived usefulness (regression coefficient = 0.270; $p < 0.01$) in blended learning emphasizes the importance of social impact in changing learners' attitudes and intents. According to Han and Ellis, (2019), creating a positive social environment in which instructors, peers, and institutional support express favourable views may lead to a more positive perception of the usefulness of blended learning, impacting the choices of students to embrace and benefit from the approach. Hypothesis 20 was accepted.

Perceived Ease of Use

In the suggested technology acceptance paradigm, many blended learning aspects influence perceived ease of use. The compatibility of the blended learning is not significantly associated ($p > 0.05$) with perceived ease of usage. Although (Butnariu, 2021)

emphasizes that recognizing and prioritizing compatibility in blended learning is critical for ensuring that learners perceive ease of use positively. When the system is aligned with their existing abilities, preferences, and processes, it provides a user-friendly experience and helps to the overall success of blended learning adoption (Ismaya et al., 2022). Therefore, the existing approach should think of improving these aspects as well. Hypothesis 6 was rejected.

Trialability in blended learning has a beneficial impact on learner views of system ease of use (regression coefficient = 0.282; $p < 0.05$). Educators and institutions provide a trial period to allow students to actively engage with the system, analyze its usability, and make informed opinions regarding its ease of use (Hariyanto et al., 2020). This strategy facilitates the adoption process and fosters good attitudes towards the blended learning system (Hypothesis 7 was accepted).

Observability is not significantly associated ($p > 0.05$) with the perceived ease of use of undergraduate entrepreneurs regarding blended learning (Hypothesis 8 was rejected). If a blended learning program isn't designed with the end user in mind, then observability becomes much less significant (Versteijlen et al., 2023).

Nevertheless, the visibility of advantages and features affects perceived ease of use, and it implies that because learners can easily look and recognize the benefits of blended learning, they have a more positive opinion of how easy it is to use the learning system i (Alamri, 2022). The specific language used in blended learning was directly correlate with perceived ease of use (regression coefficient = 0.343; $p < 0.01$), multiple factors such as interface design, visual elements, user support, and cultural sensitivity can have a significant impact on how learners understand the usability of their educational system (Tawfik et al., 2022). Hypothesis 9 was accepted.

The favourable link between the presence of an instructor assistant and perceived ease of use in blended learning emphasizes the need of offering additional support and guidance (regression coefficient = 0.495; $p < 0.01$). Developing an encouraging educational setting with responsive assistance increases learners' convenience, confidence, and favourable judgements of how easy it is to navigate (Mirmoghtadaie et al., 2020) use the blended learning system. Hypothesis 10 was accepted.

The learner's ability to operate computers, technology, and online resources correlates positively with their judgement of how easy it is to use blended learning systems (regression coefficient = 0.416; $p < 0.01$). Supporting learners with diverse levels of computer literacy and encouraging digital skill development can improve the general user experience while leading to favorable impressions of ease of use in blended learning (Bykova et al., 2021). Hypothesis 11 was accepted.

Cronje, (2020) defines a blended learning package as the complete combination of instructional content, resources, activities, and technologies used in a blended learning environment. Blended learning package is positively correlated to ease of use in blended learning system (regression coefficient = 0.138; $p < 0.05$). According to Chen et al., (2022), the quality and coherence of the blended learning package improves, learners are more likely to regard the system as easy to use (hypothesis 12 was accepted).

Perceived enjoyment is positively correlated with perceived ease of use in blended learning (regression coefficient = 2.032; $p < 0.001$). Alamri et al., (2020) emphasizes the necessity of designing learning experiences that are both efficient and enjoyable for students. Creating engaging and fulfilling learning environments improves not just learners' enjoyment but also their view of the system's ease of use (Humida et al., 2022). Hypothesis 13 was accepted.

According to Riwayani and Harahap, (2022), independence refers to the learner's ability to manage their own learning in a blended learning environment. A positive association indicates that as individuals demonstrate increased independence in their interactions with the blended learning environment (regression coefficient = 0.189; $p < 0.05$), they are more likely to regard the system as easy to use. Independence contributes to a positive overall user experience (Brata et al., 2020). Hypothesis 14 was accepted. Interaction in blended learning is referring to the engagement and communication that takes place among learners, instructors, and learning resources inside the blended learning environment (Mami et al., 2021). The encouraging association between interaction in blended learning and perceived ease of use (regression coefficient = 0.167; $p < 0.01$) emphasizes the necessity of designing engaging and

collaborative learning environments (Panigrahi et al., 2022).

Table 5. Summary of hypothesis of blended learning technological acceptance model by undergraduate entrepreneurs

Hypotheses	Relationship	Estimates	S.E.	C.R.	Sig. (p value)	Results
H24	Blended learning usage <--- Behavioural intention	0.190	0.038	5.010	P < 0.001	Supported
H21	Behavioural intention <--- perceived usefulness	0.447	0.183	2.439	p < 0.05	Supported
H22	Behavioural intention <--- perceived ease of use	1.496	0.295	5.080	p < 0.001	Supported
H23	Perceived usefulness <--- perceived ease of use	1.218	0.252	4.832	p < 0.001	Supported
H1	Perceived usefulness <--- job relevance	0.501	0.094	5.342	p < 0.001	Supported
H2	Perceived usefulness <--- output quality	0.291	0.094	3.095	p < 0.01	Supported
H3	Perceived usefulness <--- result demonstrability	0.412	0.119	3.448	p < 0.001	Supported
H4	Perceived usefulness <--- image	0.281	0.100	2.823	p < 0.01	Supported
H5	Perceived usefulness <--- relative advantage	0.243	0.121	2.005	p < 0.05	Supported
H17	Perceived usefulness <--- compatibility	0.215	0.100	2.141	p < 0.05	Supported
H18	Perceived usefulness <--- trialability	0.236	0.102	2.304	p < 0.05	Supported
H19	Perceived usefulness <--- observability	0.165	0.077	2.140	p < 0.05	Supported
H20	Perceived usefulness <--- subjective norm	0.270	0.090	2.998	p < 0.01	Supported
H6	Perceived ease of use <--- compatibility	0.191	0.118	1.615	p > 0.05	Not supported
H7	Perceived ease of use <--- trialability	0.282	0.135	2.091	p < 0.05	Supported
H8	Perceived ease of use <--- observability	0.029	0.062	0.466	p > 0.05	Not supported
H9	Perceived ease of use <--- language	0.343	0.116	2.963	p < 0.01	Supported
H16	Perceived ease of use <--- self efficacy	0.282	0.095	2.959	p < 0.01	Supported
H15	Perceived ease of use <--- interaction	0.167	0.063	2.674	p < 0.01	Supported
H14	Perceived ease of use <--- independency	0.189	0.094	2.015	p < 0.05	Supported
H13	Perceived ease of use <--- perceived enjoyment	2.032	0.478	4.254	p < 0.001	Supported
H11	Perceived ease of use <--- computer literacy	0.416	0.155	2.691	p < 0.01	Supported
H10	Perceived ease of use <--- instructor assistant	0.495	0.157	3.151	p < 0.01	Supported
H12	Perceived ease of use <--- blended learning package	0.138	0.061	2.259	p < 0.05	Supported

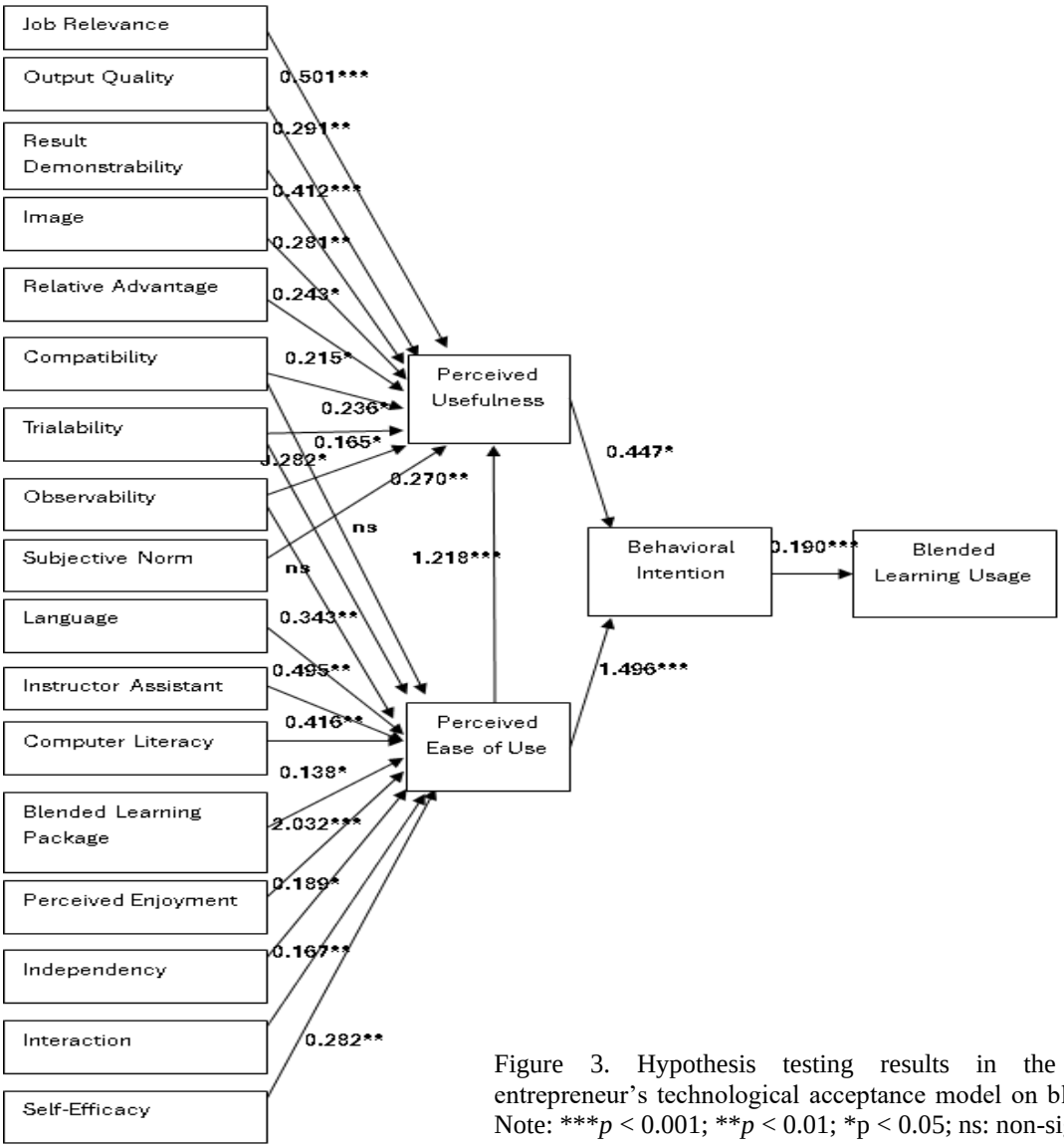

Figure 3. Hypothesis testing results in the undergraduate entrepreneur's technological acceptance model on blended learning. Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; ns: non-significant

A study found that student-instructor contact had an effect on learner satisfaction in blended learning (Siriwardena et al., 2023). This is learners' subjective judgement of how essential the system is in terms of ease of use (Hypothesis 15 was accepted).

Self-efficacy is a person's confidence in their ability to perform tasks or achieve objectives, and it is a crucial factor in learning achievement (Fidan and Tuncel, 2021). The positive link between self-efficacy and perceived ease of use (regression coefficient = 0.282; $p < 0.01$) in blended learning underlines the importance of building learner confidence and capacities (Yoon et al., 2020). Hypothesis 16 was accepted.

Perceived usefulness and Perceived Ease of Use

Perceived usefulness in blended learning is significantly positively influenced by perceived ease of use (regression coefficient = 1.218; $p < 0.001$). Huang, (2021) highlighted the same findings which are in line with the results from this study too. The association between perceived ease of use and perceived usefulness in the framework of blended learning is an important factor that influences the overall efficacy of this educational strategy (hypothesis 23 was accepted).

Behavioural intention

Perceived usefulness (PU) and perceived ease of use (PEU) can influence undergraduate entrepreneurs' inclinations to employ blended learning (Chen et al., 2022). Perceived usefulness (regression coefficient = 0.447; $p < 0.05$) and perceived ease of use (regression coefficient = 1.496; $p < 0.001$) have a significant impact on undergraduate entrepreneurs' intention to use blended learning. This highlights the importance of designing blended learning programs that meet entrepreneurs' practical needs and provide a user-friendly experience. According to Li and Zhu, (2022), recognizing the relevance of learning content to entrepreneurial activities and providing a consistent, user-friendly interface can positively influence entrepreneurs' intentions to incorporate blended learning into their educational system. Hypotheses 21 and 22 are accepted.

Blended learning usage

The encouraging influence (regression coefficient = 0.190; $p < 0.001$) of intention on undergraduate entrepreneurs' use of blended learning emphasizes the importance of knowing and implementing their motivation and willingness to interact with this learning strategy (Chen et al., 2022). Educational settings and instructional developers can increase this positive impact by coordinating blended learning programs with entrepreneurs' practical requirements, providing appropriate and interesting content and guaranteeing the learning experience is user-friendly and in favour of entrepreneurial objectives (hypothesis 24 was accepted). Table 5 and figure 3 represent the hypothesis testing results in the undergraduate entrepreneur's technological acceptance model on blended learning

Conclusion

When analyzing the perceived usefulness of blended learning technology, job relevance had the strongest significant association. In descending order, result demonstrability, output quality, image, subjective norm, relative advantage, trialability, compatibility, and observability all had substantial positive relationships with the perceived usefulness of blended learning technology. In perceived ease of use in blended learning technology, perceived enjoyment indicated a strong positive correlation. Likewise in descending order, instructor assistant, computer literacy, language, trialability, self-efficacy, independence, interaction, and blended learning package showcased the positive correlation with perceived ease of use in blended learning. However, the compatibility and observability in blended learning technology do not indicate a significant correlation for the perceived ease of use in blended learning. Perceived ease of use and perceived usefulness of blended learning technologies were found to be significantly positive predictors of blended learning intention among undergraduate entrepreneurs. Furthermore, there was a substantial positive relationship between perceived ease of use and perceived usefulness in blended learning technology. Furthermore, blended learning intention showed a significant beneficial correlation with blended learning usage among undergraduate entrepreneurs.

Understanding the theoretical and practical implications allows participants in agricultural development to design blended learning programmes that are not only successful but also easily adopted by agricultural entrepreneurs. This can help people gain access to knowledge, develop necessary skills, and contribute to a more robust agricultural sector. There are theoretical and practical implications to the programme. The main theoretical implication of the findings is that they provide support to Technology Acceptance Models (TAM). When taking into account the study's practical implications, the programme can help people develop the knowledge, acquire specialized skills, and have access to resources that will enable them to succeed. This can also entail offering local language choices, encouraging peer interaction, and including instances of actual agriculture. Then, while advancing digital literacy skills, personalizing content and delivery. Given the compatibility and observability for agricultural entrepreneurs, this finding provides opportunities for more research to examine the precise elements influencing the perceived usefulness and ease of use of blended learning for them. Though blended learning seems promising, more investigation is required to determine how best to tailor it to the unique requirements and difficulties faced by agricultural entrepreneurs.

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