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Epistemological Beliefs, Digital Literacy, and Cultural Attitudes in Shaping Students Entrepreneurial Knowledge

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Abstract

The development of higher education in the digital era presents new challenges for students, particularly in developing entrepreneurial competencies that are relevant to global needs while also rooted in local cultural values. The integration of cognitive aspects, digital skills, and cultural attitudes is becoming increasingly important in producing a young generation capable of innovating and competing in the face of globalization. Although various previous studies have highlighted the role of epistemological beliefs, digital literacy, and cultural attitudes separately, studies that integrate all three within the framework of strengthening entrepreneurial knowledge are still limited, especially in Indonesia. This study investigates the impact of epistemological beliefs and digital literacy on shaping students' cultural attitudes and entrepreneurial knowledge within the context of higher education in Indonesia. Using a quantitative approach and an explanatory survey method, data were collected from 398 students and analyzed using Structural Equation Modelling with Partial Least Squares (SEM-PLS). The results indicate that epistemological beliefs have a significant and positive impact on digital literacy, cultural attitudes, and entrepreneurial knowledge, thereby confirming their pivotal role in the development of entrepreneurial competencies. Digital literacy also has a significant, albeit relatively weaker, influence on cultural attitudes and entrepreneurial knowledge. Furthermore, cultural attitudes proved to be a significant mediator, strengthening the relationship between cognitive and digital factors and entrepreneurial achievement. This research model demonstrated high predictive power, accounting for 69.0% of the variance in entrepreneurial knowledge. These findings enrich the literature by integrating cognitive, technological, and cultural dimensions into a comprehensive framework for entrepreneurship education.

Keywords:

Epistemological Beliefs;
Digital Literacy;
Cultural Attitudes;
Students' Entrepreneurial Knowledge;
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1- Introduction

The changing landscape of higher education in the digital era has created new challenges and opportunities for students. These rapid and dynamic changes require students to no longer master academic theory; they are also required to have the capacity to adapt to complex, rapid, and uncertain global dynamics [1, 2]. Higher education must develop skills to address economic and sustainability issues [3]. In this context, entrepreneurial knowledge is becoming an increasingly important key competency for the younger generation, especially students. They must understand basic business concepts and apply them contextually, innovatively, and sustainably to survive, thrive, and create value in real life. This ability helps them face workplace challenges and develop solutions to various social and economic problems by developing new products, building businesses, selling products/services, and evaluating their business environment

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[4]. However, one major challenge is the entrepreneurship approach, which is still dominated by global models that are not necessarily appropriate or relevant to Indonesian society's local conditions, culture, and characteristics. This gap drives the need for an entrepreneurial approach that is not solely based on technical knowledge but also considers epistemological, digital, and cultural aspects. It is where the role of epistemological beliefs, digital literacy, and cultural attitudes becomes strategic in shaping a comprehensive and contextual understanding of entrepreneurship.

Digital literacy is a 21st-century competency that is inseparable from the process of learning and developing entrepreneurship. Digital literacy uses technological devices and involves critical skills in accessing, evaluating, and utilizing information to support business decision-making [5, 6]. In entrepreneurship, digital literacy enables students to reach a wider market, capitalize on digital trends, and develop marketing strategies more relevant to consumer needs [7, 8]. Moreover, digitalization opens up opportunities to elevate local cultural values to the global stage through creative products, brand storytelling, and innovations based on local wisdom [9]. In the business world, digital literacy is a crucial factor contributing to business growth, not only related to entrepreneurial intentions but also implicitly reflecting entrepreneurial knowledge and competency [10]. It is reinforced by the findings of Azizan & Loh Rahim [11] through a bibliometric analysis of more than 5,000 Scopus-indexed publications, which showed that digital competencies, including digital literacy, have high relevance in the context of entrepreneurship, indicating a close relationship between digital capabilities and knowledge, skills, and success in today's entrepreneurial world.

Epistemological beliefs are crucial for shaping students' readiness to face 21st-century challenges. It is because epistemological beliefs are crucial in shaping how students understand, evaluate, and use knowledge. These beliefs encourage students to employ a more in-depth learning approach to problem-solving [12]. A study by Lonka et al. [13] of 1.515 students from five faculties showed that epistemic profiles are closely related to students' conceptions of learning and academic achievement. Bahcivan et al. [14] also emphasized that epistemological beliefs are an important predictor of digital literacy mastery. Students with mature epistemological beliefs tend to think reflectively, critically, and are open to various approaches to knowledge [15, 16]. This attitude is highly relevant in entrepreneurship's dynamic, complex, and uncertain world. Belief in the non-absolute and constantly evolving nature of knowledge encourages students to learn independently, develop cognitive flexibility, and adaptively integrate learning strategies and technology [17, 18], including in entrepreneurship knowledge.

As an individual's attitude toward culture, cultural attitudes act as a bridge between epistemological beliefs, digital literacy, and entrepreneurial knowledge. Strong cultural attitudes help students remain grounded in their local identity when developing products or services, reducing the risk of adopting foreign business models incompatible with local values [19, 20]. Conversely, an appreciation for one's own culture can inspire the creation of authentic products with a competitive advantage. Studies in Indonesia and other countries confirm that cultural values of entrepreneurship influence entrepreneurial attitudes and the effectiveness of entrepreneurship education [21]. For example, internalizing family and community cultural values influences the development of students' entrepreneurial knowledge and skills [22]. Another study at the University of Ibadan showed that cultural support significantly predicts students' entrepreneurial intentions. Although it does not directly influence entrepreneurial knowledge, it does strengthen attitudes and motivations related to entrepreneurship [23]. Other researchers have also confirmed that culturally based entrepreneurial practices that combine local crafts, traditional values, and modern digital approaches have proven harmonious and innovative [24-26].

This study presents a new approach to developing entrepreneurship knowledge by integrating three main dimensions: digital literacy, epistemological beliefs, and cultural attitudes. This approach offers a more comprehensive and contextual framework than previous studies, which tended to be fragmented. First, this study emphasizes the importance of locally based entrepreneurial knowledge as a critical response to the dominance of global models less relevant to the Indonesian context. Second, epistemological beliefs are positioned as cognitive mediators that bridge digital literacy with adaptive capabilities in entrepreneurship. Third, digital literacy is seen as a catalyst for culture-based innovation, not merely a technical skill, but a strategic tool for packaging local values in a globally competitive form. Thus, this study introduces a new conceptual framework that unites cognitive, digital, and cultural aspects to form more relevant, adaptive, and sustainable entrepreneurial knowledge. Ultimately, this study aims to fill this gap by developing and testing a model that integrates epistemological beliefs, digital literacy, and cultural attitudes to strengthen students' entrepreneurial knowledge. This model is expected to make a tangible contribution to developing culture-based entrepreneurship in the digital era.

2- Conceptual Framework of Study

2-1- Epistemological Beliefs

Epistemological beliefs play a crucial role in learning, especially in the ever-evolving digital era. The belief that knowledge is complex, contextual, and dynamic, always open to revision and renewal, encourages students to develop a reflective and critical learning approach, rather than passively receiving information [27]. Students with mature epistemological beliefs tend to be more active in questioning, analyzing, and evaluating the information they receive,

especially from diverse digital sources [28, 29]. It has important implications for digital literacy, as this critical and reflective attitude forms the basis for assessing the credibility of information, avoiding hoaxes, and understanding the social and cultural context of the technology used [30, 31]. Furthermore, developed epistemological beliefs also help students use digital devices more strategically and meaningfully, not only as technical tools but also as a means to build new understanding and knowledge. Thus, epistemological maturity strengthens learning strategies and provides a crucial cognitive foundation for developing sustainable and adaptive digital literacy.

H1: *Epistemological beliefs have a positive effect on digital literacy.*

Mature epistemological beliefs also foster openness to diverse cultural perspectives, as students recognize that knowledge is not absolute but rather influenced by the social, historical, and cultural contexts in which it develops [32]. This awareness fosters a more inclusive, flexible, and tolerant perspective on differences in academic settings and social life. Students with an open epistemological understanding are more able to interact productively in multicultural environments and appreciate diverse ways of thinking. Conversely, rigid epistemological beliefs often correlate with exclusive, ethnocentric attitudes and a tendency to reject information or perspectives that disagree with their beliefs. A study in South Africa showed that although entrepreneurship is viewed positively, the local culture's low tolerance for risk is a hindering factor in encouraging innovation and business development on a large scale [33]. It suggests that culture significantly influences how individuals make decisions, whether they are more effectual (based on available resources) or causal (based on specific goals). These cultural values ultimately shape an entrepreneurial social identity that influences overall business behavior [34].

H2: *Epistemological beliefs have a positive effect on cultural attitudes.*

Other research also shows that entrepreneurial knowledge is not solely dependent on mastery of business concepts but also requires the ability to think critically, adapt to change, and respond constructively to feedback to improve business strategies [35, 36]. In this context, individuals with mature epistemological beliefs, who view knowledge as complex, dynamic, and evolving, are more open to continuous learning. They tend to absorb information from the market environment actively, analyze emerging trends, and process data reflectively to transform it into practical knowledge that can be applied in business decision-making [32]. This attitude is crucial in entrepreneurship, which is uncertain and demands high flexibility. Students with a strong epistemological foundation can better navigate business challenges adaptively and innovatively. Therefore, epistemological beliefs are not only related to how individuals understand and interpret knowledge but also serve as a key foundation for developing entrepreneurial knowledge that is relevant, contextual, and oriented towards sustainable development in the business world.

H3: *Epistemological beliefs have a positive effect on entrepreneurial knowledge.*

2-2- Digital Literacy

Strong digital literacy skills are crucial for students in tracking and inventorying various cross-cultural information through digital media. By mastering the skills of critically evaluating, interpreting, and producing information, students can understand content in depth and develop stronger cultural empathy. This enables them to appreciate the differences in values, traditions, and perspectives across communities worldwide, broadening and enriching their multicultural perspectives [37]. Mature digital literacy not only expands students' access to diverse cultural narratives that were previously difficult to access but also leverages the convenience and usefulness of digital technology to foster more open and reflective cultural attitudes. Through intense digital interactions, students are encouraged to think critically about cultural stereotypes and prejudices and can develop an inclusive and tolerant understanding [38, 39]. Thus, digital literacy is crucial in developing adaptive and sensitive individuals to increasingly complex global sociocultural dynamics.

H4: *Digital literacy has a positive effect on cultural attitudes.*

Digital literacy plays a highly strategic role in helping students face the challenges and opportunities of today's digital era. Through digital literacy, students can access market information more quickly and accurately, learn about ever-changing global trends, and build a broad and diverse entrepreneurial network [40]. Strong digital skills enable students to recognize new business opportunities from market dynamics and develop effective marketing strategies utilizing digital technologies, such as social media and e-commerce platforms. Furthermore, digital literacy helps students generate innovations based on valid and reliable information, resulting in more informed and sustainable business decisions [41]. It makes digital literacy a crucial factor in enhancing students' entrepreneurial knowledge and skills, not only in the local context but also in a more competitive global context. Thus, developing digital literacy supports students' ability to survive and thrive in the business world and equips them to adapt to rapid technological and market changes. Digital literacy is a key foundation for future entrepreneurial success.

H5: *Digital literacy has a positive effect on entrepreneurial knowledge.*

2-3- Cultural Attitudes

Cultural attitudes enable students to integrate cultural values into their entrepreneurial knowledge more in-depth and meaningfully [42, 43]. Through understanding and appreciating local culture, students can identify local potential and wisdom as sources of authentic business ideas rooted in community identity. Furthermore, openness to global culture enables students to absorb modern entrepreneurial practices, technological innovations, and relevant international market trends. This combination creates products or services that are not unique and authentic but also competitive in the broader market [25, 44, 45]. Furthermore, cultural attitudes serve as an interpretive framework for interpreting market dynamics and consumer behavior. Students with cultural awareness will be more sensitive to the values, norms, and needs of the local community, thus developing more contextual, relevant, and applicable entrepreneurial knowledge. Thus, integrating cultural attitudes into the learning process and entrepreneurial practice enriches knowledge and improves the business's competitiveness and sustainability.

H6: *Cultural attitudes have a positive effect on entrepreneurial knowledge.*

Students with mature epistemological beliefs can better appreciate the complexity and diversity of cultures because they recognize that knowledge does not arise in a vacuum but is formed through diverse social and cultural interactions [32, 46]. This open cultural attitude enables students to be more adaptive in responding to various social dynamics, including in cross-cultural business contexts. In entrepreneurial situations, understanding local and global cultural values is crucial for interpreting market information, building strong business relationships, and tailoring products or services to diverse consumer needs. Business information can be transformed into more contextual, relevant, and applicable entrepreneurial knowledge through an inclusive and flexible cultural perspective. In other words, cultural attitudes mediate and strengthen the relationship between epistemological beliefs and entrepreneurial knowledge [21, 47]. When students possess positive cultural attitudes, their epistemological beliefs will be more effective in fostering the understanding and application of entrepreneurial knowledge responsive to social diversity and global market dynamics.

H7: *Cultural attitudes mediate the relationship between epistemological beliefs and entrepreneurial knowledge.*

Digital literacy skills are crucial in broadening students' exposure to cross-cultural information from various digital platforms, from social media and business articles to international forums. This exposure has significant potential to enrich students' entrepreneurial perspectives and knowledge. However, ensuring that this information is not merely passively received but processed into meaningful insights requires an open and adaptive cultural attitude as an interpretive filter [48-50]. This cultural attitude helps students assess, sort, and internalize information based on relevant socio-cultural contexts, transforming digital information into entrepreneurial knowledge that is contextual, applicable, and sensitive to cultural differences. Thus, cultural attitudes not only strengthen individual adaptive capacity but also act as a significant mediator in the relationship between digital literacy and entrepreneurial knowledge. Without a positive cultural attitude, digital literacy risks consuming information without an in-depth understanding. Therefore, combining digital skills and cultural competencies is key to developing meaningful and competitive entrepreneurial knowledge.

H8: *Cultural attitudes mediate the relationship between digital literacy and entrepreneurial knowledge.*

3- Method

3-1- Research Design

This study employed a quantitative approach with an explanatory survey method [51]. This approach was chosen because it enables the explanation of causal relationships between variables through measurable hypothesis testing. The research model employs Structural Equation Modelling (SEM) analysis, which enables researchers to examine direct and indirect relationships between variables, including the mediating role of cultural attitudes in relation to epistemological beliefs, digital literacy, and entrepreneurial knowledge.

3-2- Research Subject

The research subjects were second, fourth-, and sixth-semester students in the Social Sciences study program at Universitas PGRI Sumatera Barat and Universitas Negeri Padang. The sampling technique used was purposive sampling with the following criteria: 1) active students at least in their second semester, 2) have taken courses related to entrepreneurship, and 3) have experience using digital media as a learning resource. The sample size was determined using the SEM rule of thumb, which recommends a minimum of 5–10 times the number of indicators. With a total of 32 indicators, the sample size of this study was 398 respondents, exceeding the standard (minimum 160), so that the test results are more robust.

3-3- Instrument

The research instrument was a questionnaire structured on a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree). The instrument was modified from several previous studies (Table 1). All instruments underwent content

validation by three experts and were declared valid with an average score of 3.25. Before being widely distributed, the instrument was piloted on 30 university students to determine whether it exhibited multiple interpretations.

Table 1. Research instrument grid

Variable/ Construct	Indicator/ Item Variable	Statement	Source
Epistemological beliefs	EBS1	I believe that knowledge can continuously evolve based on new evidence and information.	[51-54]
	EBS2	I believe that effective learning requires effort and time to understand a topic deeply.	
	EBS3	I believe that everyone can develop their own understanding through learning experiences.	
	EBS4	I believe that knowledge comes not only from lecturers or books, but also from experience and discussions with others.	
	EBS5	I believe that the answer to a problem is not always a single one, but can have multiple perspectives.	
	EBS6	I believe that understanding a concept is more important than simply memorizing information.	
Digital literacy	DLC1	I can search for and find relevant academic information through digital sources.	[55-58]
	DLC2	I can evaluate the reliability and credibility of information obtained from digital media.	
	DLC3	I am familiar with using digital applications or platforms to support the learning process.	
	DLC4	I can manage digital data and information systematically, making it easily accessible.	
	DLC5	I understand the importance of ethics in using digital media, such as avoiding plagiarism and maintaining privacy.	
	DLC6	I can communicate and collaborate effectively using various digital platforms.	
Cultural attitudes	CAS1	I respect the cultural diversity that exists on campus and in the community.	[59-61]
	CAS2	I strive to maintain and preserve local cultural values in my daily life.	
	CAS3	I am open to learning about cultures from other regions and countries as a means of fostering tolerance.	
	CAS4	I believe it is important to practice cooperation, courtesy, and respect as part of our national cultural identity.	
	CAS5	I can adapt to differences in cultural values and norms without losing my identity.	
	CAS6	I believe that cultural understanding can improve the quality of social interactions and collaboration with others.	
Entrepreneurial knowledge	EKG1	I understand the basics of entrepreneurship, including how to identify business opportunities.	[36, 62, 63]
	EKG2	I am familiar with the key steps in developing a business plan.	
	EKG3	I understand the simple management concepts necessary for running a business.	
	EKG4	I am familiar with the marketing strategies that can be employed to promote products/services.	
	EKG5	I know business financial management, including basic record-keeping.	
	EKG6	I understand the importance of innovation and creativity in driving business growth.	

Data were collected through the distribution of an online questionnaire using the Google forms platform. This method was chosen to facilitate respondent reach and minimize location bias. Prior to completion, respondents were provided with an explanation of the research objectives and guaranteed data confidentiality. Informed consent was also obtained to ensure voluntary participation. The collected data were then screened to avoid incomplete responses or outliers.

3-4- Data Analysis

The SEM-PLS analysis was conducted in two main stages: measurement model analysis (outer model) and structural model analysis (inner model). The primary objective of the outer model analysis was to assess construct validity and reliability. Convergent validity was evaluated using outer loading values, with indicators considered valid if their loadings were at least 0.70. Indicators with loadings between 0.50 and 0.70 could still be retained provided that the Average Variance Extracted (AVE) and overall construct reliability met the required criteria [64, 65]. An AVE value greater than 0.50 indicates that a construct is capable of explaining more than 50% of the variance in its indicators [66, 67]. Discriminant validity was examined using the Heterotrait-Monotrait Ratio (HTMT) and cross-loadings. Specifically, the square root of AVE should exceed inter construct correlations, indicator loadings should be higher on their associated construct than on others, and HTMT values should remain below 0.90. Construct reliability was assessed through Composite Reliability (CR), with ideal values ranging from 0.70 to 0.90, and Cronbach's alpha, which is acceptable at 0.60 and preferable above 0.80 [64, 68].

The inner model analysis aimed to evaluate relationships among constructs. These relationships were assessed using path coefficients, with significance tested through bootstrapping. Results were deemed significant when t-statistics exceeded 1.96 ($p < 0.05$) at the 5% significance level. Model strength was further assessed using the coefficient of determination (R^2), with thresholds of 0.75 (substantial), 0.50 (moderate), and 0.25 (weak) [69].

The flowchart of the research methodology that was used to achieve the study's aims is shown in Figure 1.

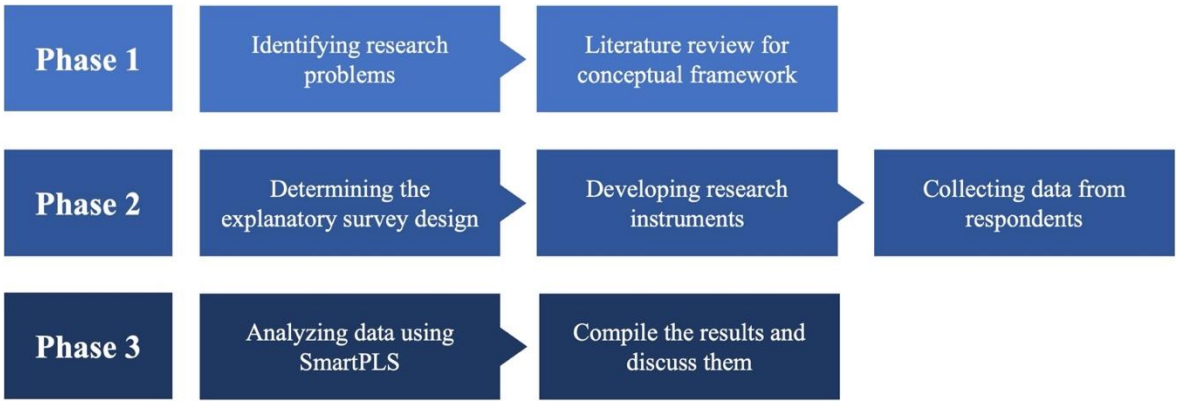

Figure 1. Research flowchart

4- Results and Discussion

Table 2 shows that all indicators have outer loadings above 0.70, indicating satisfactory indicator validity. The Cronbach's alpha values for all constructs range from 0.868 to 0.918, exceeding the threshold of 0.70 and demonstrating excellent internal consistency. Composite Reliability values, ranging from 0.901 to 0.937, further reinforce the reliability of the constructs. In addition, the AVE values for all constructs (0.603-0.713) surpass the minimum standard of 0.50, confirming strong convergent validity. Taken together, these findings indicate that the research instrument possesses a high level of measurement quality.

Table 2. Reliability and validity tests of research constructs

	Outer loadings	Cronbach's alpha	Composite reliability	AVE
EBS1	0.816	0.918	0.937	0.713
EBS2	0.809			
EBS3	0.758			
EBS4	0.909			
EBS5	0.896			
EBS6	0.868			
DLC1	0.806	0.868	0.901	0.603
DLC2	0.818			
DLC3	0.790			
DLC4	0.766			
DLC5	0.760			
DLC6	0.716			
CAS1	0.784	0.899	0.922	0.664
CAS2	0.823			
CAS3	0.839			
CAS4	0.806			
CAS5	0.812			
CAS6	0.825			
EKG1	0.744	0.879	0.908	0.624
EKG2	0.824			
EKG3	0.797			
EKG4	0.721			
EKG5	0.808			
EKG6	0.839			

Table 3 shows that all HTMT values range between 0.713 and 0.871, remaining below the recommended threshold of 0.90, thereby satisfying the criterion for discriminant validity. The highest value was observed in the relationship between epistemological beliefs and entrepreneurial knowledge (0.871), suggesting a relatively strong correlation that nevertheless falls within acceptable limits. These findings demonstrate that each construct in the model maintains sufficient conceptual distinctiveness, with no evidence of discriminant validity concerns across the constructs.

Table 3. Validity discriminant test with HTMT criteria

	Epistemological beliefs	Digital literacy	Cultural attitudes	Entrepreneurial knowledge
Epistemological beliefs				
Digital literacy	0.798			
Cultural attitudes	0.833	0.713		
Entrepreneurial knowledge	0.871	0.749	0.846	

Table 4 shows that all indicators meet the required criteria. The indicator EBS4 shows the highest loading on the construct epistemological beliefs (0.909) compared to other constructs, while CAS3 exhibits the highest loading on cultural attitudes (0.839). A similar pattern is observed across all other constructs, indicating that each indicator is more strongly associated with its designated construct than with any alternative construct. Accordingly, these findings confirm the presence of sound discriminant validity within the measurement model.

Table 4. Discriminant validity test through cross loadings

	Epistemological beliefs	Digital literacy	Cultural attitudes	Entrepreneurial knowledge
EBS1	0.816	0.531	0.565	0.609
EBS2	0.809	0.586	0.620	0,638
EBS3	0.758	0.555	0.542	0.622
EBS4	0.909	0.656	0.701	0.704
EBS5	0.896	0.681	0.760	0.721
EBS6	0.868	0.609	0.666	0.707
DLC1	0.528	0.806	0.438	0.517
DLC2	0.564	0.818	0.459	0.525
DLC3	0.632	0.790	0.545	0.532
DLC4	0.558	0.766	0.476	0.489
DLC5	0.542	0.760	0.600	0.556
DLC6	0.506	0.716	0.435	0.444
CAS1	0.590	0.575	0.784	0.595
CAS2	0.575	0.426	0.823	0.600
CAS3	0.583	0.487	0.839	0.593
CAS4	0.741	0.603	0.806	0.625
CAS5	0.669	0.553	0.812	0.653
CAS6	0.562	0.457	0.825	0.631
EKG1	0.482	0.449	0.512	0.744
EKG2	0.695	0.582	0.545	0.824
EKG3	0.594	0.505	0.628	0.797
EKG4	0.528	0.466	0.548	0.721
EKG5	0.734	0.604	0.612	0.808
EKG6	0.677	0.506	0.724	0.839

Table 5 shows the mean and standard deviation values for each construct indicator in the study. The mean scores range from 2.992 (EBS6) to 3.369 (EKG1), indicating that, overall, respondents tended to provide favorable evaluations across all indicators. The standard deviation values are relatively low, ranging from 0.630 to 0.807, suggesting consistency in respondents' answers and a moderate level of data dispersion. The indicator with the highest mean, EKG1 (3.369), reflects the most positive perception of a specific aspect of entrepreneurial knowledge, whereas EBS6 (2.992) demonstrates a relatively lower perception compared to other indicators. These findings provide an initial overview of respondent tendencies and perceptions toward each research variable prior to conducting structural analysis.

Table 5. Descriptive statistics of research indicators

	Mean	Standard deviation
CAS1	3.101	0.716
CAS2	3.244	0.648
CAS3	3.221	0.670
CAS4	3.196	0.685
CAS5	3.156	0.761
CAS6	3.307	0.692
DLC1	3.214	0.647
DLC2	3.259	0.666
DLC3	3.188	0.703
DLC4	3.178	0.692
DLC5	3.173	0.721
DLC6	3.236	0.719
EBS1	3.005	0.805
EBS2	3.028	0.781
EBS3	3.181	0.778
EBS4	3.015	0.753
EBS5	3.025	0.760
EBS6	2.992	0.807
EKG1	3.369	0.639
EKG2	3.173	0.725
EKG3	3.266	0.630
EKG4	3.339	0.636
EKG5	3.141	0.737
EKG6	3.296	0.652

Table 6 shows that all hypothesized relationships yielded positive and statistically significant results at the 0.05 significance level, as indicated by p-values below 0.05 and t-statistics well above the critical threshold of 1.96. The strongest relationship was observed between epistemological beliefs and digital literacy ($\beta = 0.717$; $T = 26.066$; $p < 0.001$), underscoring the substantial role of epistemological beliefs in enhancing digital literacy. In addition, epistemological beliefs exerted significant effects on cultural attitudes ($\beta = 0.635$) and entrepreneurial knowledge ($\beta = 0.443$), highlighting their dominant influence in shaping both cognitive and affective constructs.

Table 6. Hypothesis test on structural model

	Original sample (β)	Standard deviation	T statistics (|O/STDEV|)	P values	Decision
Epistemological beliefs → Digital literacy	0.717	0.028	26.066	0.000	Positive and significant
Epistemological beliefs → Cultural attitudes	0.635	0.055	11.588	0.000	Positive and significant
Epistemological beliefs → Entrepreneurial knowledge	0.443	0.065	6.839	0.000	Positive and significant
Digital literacy → Cultural attitudes	0.183	0.060	3.049	0.002	Positive and significant
Digital literacy → Entrepreneurial knowledge	0.127	0.045	2.819	0.005	Positive and significant
Cultural attitudes → Entrepreneurial knowledge	0.337	0.059	5.675	0.000	Positive and significant
Epistemological beliefs → Cultural attitudes → Entrepreneurial knowledge	0.214	0.046	4.683	0.000	Positive and significant
Digital literacy → Cultural attitudes → Entrepreneurial knowledge	0.062	0.021	2.910	0.004	Positive and significant

The findings further reveal that digital literacy significantly, albeit more modestly, influenced cultural attitudes ($\beta = 0.183$) and entrepreneurial knowledge ($\beta = 0.127$). Meanwhile, cultural attitudes emerged as a critical predictor of entrepreneurial knowledge ($\beta = 0.337$) and served as a mediator in two tested mediation pathways. Specifically, cultural attitudes strengthened the impact of epistemological beliefs on entrepreneurial knowledge ($\beta = 0.214$) and the effect of digital literacy on entrepreneurial knowledge ($\beta = 0.062$), both of which were statistically significant. Collectively, these results affirm that reinforcing epistemological beliefs and digital literacy either directly or through the enhancement of cultural attitudes contributes significantly to advancing entrepreneurial knowledge.

Based on the R^2 values presented in Figure 2, epistemological beliefs and digital literacy collectively account for 51.4% of the variance in digital Literacy, indicating a moderately strong predictive contribution. Similarly, epistemological beliefs and digital literacy explain 60.3% of the variance in cultural attitudes, which can be classified as a strong effect. Meanwhile, the combined influence of epistemological beliefs, digital literacy, and cultural attitudes explains 69.0% of the variance in entrepreneurial knowledge, reflecting a very high predictive capacity.

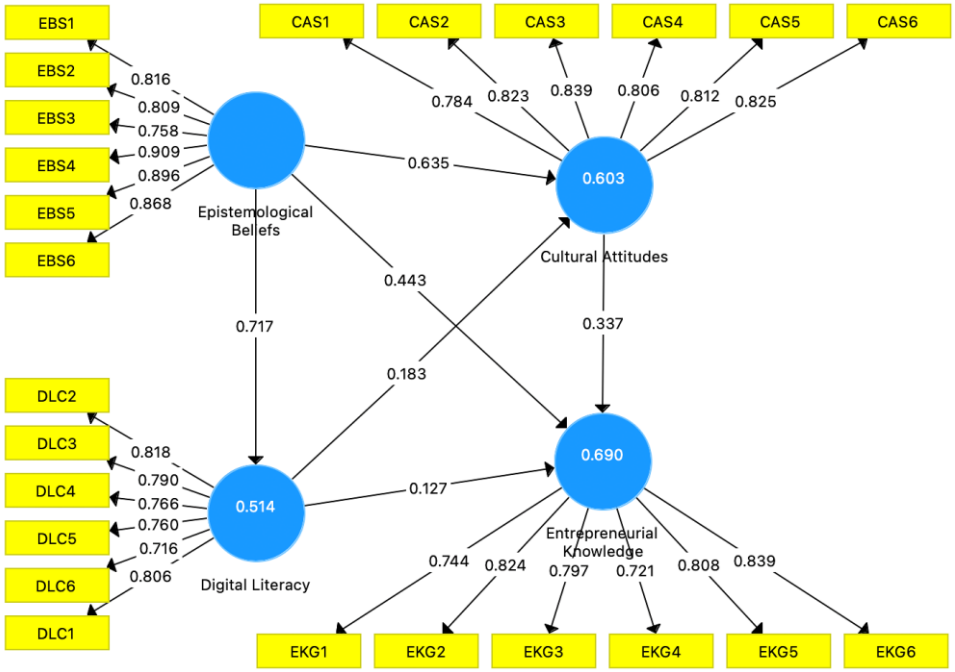

Figure 2. Analysis result of PLS-SEM R^2

From a practical standpoint, these findings highlight the model's robust explanatory power, particularly with respect to entrepreneurial knowledge. This underscores the strategic importance of strengthening cognitive factors (epistemological beliefs) and digital competencies, as both serve as critical levers for enhancing entrepreneurial knowledge particularly when mediated through the reinforcement of cultural attitudes.

The results of the study indicate that all proposed hypotheses are significantly supported. Epistemological beliefs were found to have a significant influence on digital literacy ($\beta = 0.717$; $p < 0.001$), while also contributing substantially to the formation of cultural attitudes ($\beta = 0.635$; $p < 0.001$) and entrepreneurial knowledge ($\beta = 0.443$; $p < 0.001$). Digital literacy also had a positive effect on cultural attitudes ($\beta = 0.183$; $p = 0.002$) and entrepreneurial knowledge ($\beta = 0.127$; $p = 0.005$), albeit with a relatively weaker relationship. Cultural attitudes themselves played a significant role as a predictor of entrepreneurial knowledge ($\beta = 0.337$; $p < 0.001$) and as a mediator that strengthened the influence pathway from epistemological beliefs and digital literacy on entrepreneurial knowledge. Analysis of the R^2 value revealed that the combination of the three independent variables effectively explained 69.0% of the variance in entrepreneurial knowledge, indicating the model's extreme predictive power.

The findings of this study indicate that epistemological beliefs are a dominant factor influencing digital literacy, cultural attitudes, and entrepreneurial knowledge. These results emphasize that mature epistemological beliefs encourage students to think critically and reflectively, and be more open to diverse perspectives [36, 70, 71]. This characteristic is an important foundation for developing digital literacy, as the ability to evaluate the credibility of information and manage data requires a critical attitude towards knowledge. Compared to Xu [72], who identified digital literacy as a core 21st-century competence, this study asserts that epistemological foundations play a more decisive role in shaping students' digital competencies. In doing so, the study adds nuance to existing scholarship by positioning epistemological beliefs not merely as a supporting factor, but as a central construct in the integration of digital literacy and cultural attitudes that enhance entrepreneurial knowledge.

Conceptually and empirically, digital literacy does not always lead to positive entrepreneurial outcomes. While digital literacy enhances the ability of students or entrepreneurs to access, process, and utilize information [73], its impact on innovation is highly dependent on the quality of its use and the underlying epistemological framework. Numerous studies have shown that digital literacy strengthens entrepreneurial opportunity recognition and operational efficiency [74, 75]. However, if individuals only use technology to imitate viral market trends without critical reflection, digital literacy can encourage imitation, not innovation. It often occurs when users focus more on benchmarking or copying and pasting strategies from successful business models on social media without understanding the local context and the unique added

value. Therefore, digital literacy needs to be balanced with mature epistemological beliefs, namely the ability to think critically, be skeptical of information sources, and be aware that knowledge is contextual and subject to change. When these elements are present, digital literacy facilitates access to information and fosters creativity and innovation that is contextual and rooted in local cultural identity.

The role of cultural attitudes as a mediator in the relationship between variables also enriches the literature on culture-based entrepreneurship. Research by Prabowo et al. [76] previously emphasized that cultural values serve as an interpretive framework for interpreting information, and this finding supports this view with empirical evidence that cultural attitudes can strengthen the influence of epistemological beliefs and digital literacy on entrepreneurial knowledge. Other studies by Valencia-Arias et al. [77] and Hoang et al. [78] also emphasize digital literacy as a key pathway to improving 21st-century competencies; however, the results of this study indicate that digital literacy becomes significant only when accompanied by an open and adaptive cultural attitude. It highlights the superiority of the current research model over previous studies, as it effectively integrates cognitive, digital, and cultural factors simultaneously in shaping entrepreneurial knowledge. Thus, this study not only confirms previous results but also broadens the scope of academic discussion by presenting a more comprehensive, integrative perspective.

Therefore, the study's findings indicate that epistemological beliefs positively influence digital literacy, cultural attitudes, and entrepreneurial knowledge, confirming the role of epistemic cognition in developing entrepreneurial competencies. This finding aligns with previous research suggesting that students with mature epistemological beliefs are more critical in evaluating digital information [28, 29], thus enabling them to assess source credibility and avoid misinformation [30, 31]. Furthermore, awareness that knowledge is contextual fosters openness to cultural diversity [32], fostering an inclusive and tolerant attitude in multicultural interactions. In the entrepreneurial context, individuals with mature epistemological beliefs are more reflective, adaptive, and open to continuous learning [35, 36]. Thus, the results of this study extend previous findings by showing an empirical relationship that epistemological beliefs are an important foundation for the formation of digital literacy, positive cultural attitudes, and dynamic and contextual entrepreneurial knowledge.

The results of this study yield significant theoretical and practical implications. Theoretically, this model emphasizes the importance of a multidimensional approach in understanding the formation of entrepreneurial knowledge, which relies not only on cognitive and technological aspects but also on cultural attitudes as a mediating mechanism. Practically, these findings provide strategic direction for universities in designing culture-based entrepreneurship curricula by strengthening students' epistemological beliefs and digital literacy, and building adaptive cultural awareness. Thus, students are not only able to access and utilize digital information effectively but also instill local cultural values in their business innovations [2, 79]. On a broader level, this model can serve as a reference for developing a generation of young entrepreneurs who are intellectually competent, digitally proficient, and rooted in their cultural identity, thereby becoming more competitive both locally and globally.

5- Conclusion

This research demonstrates that the development of students' entrepreneurial knowledge is the outcome of a dynamic synergy among epistemological beliefs, digital literacy, and cultural attitudes. Of these, digital literacy stands out as a crucial element in facing entrepreneurial challenges in the era of digital transformation. Students' ability to effectively access, evaluate, and utilize information is key to responding to market changes, capturing business opportunities, and developing data-driven business strategies. While epistemological beliefs remain the foundation for critical and reflective thinking, and cultural attitudes enhance the local relevance of the knowledge developed, digital literacy plays a crucial role in operationalizing entrepreneurial knowledge.

Digital literacy enables students to bridge the gap between current theory and empirical practice, thereby expanding the reach of innovation through the effective use of digital technology. Therefore, entrepreneurship education in higher education needs to place greater emphasis on strengthening digital literacy integrated with epistemological understanding and cultural awareness. With this approach, graduates will not only be intellectually competent but also responsive to technological developments and capable of producing innovations that are contextual, globally competitive, and rooted in local values. Ultimately, these findings provide an important contribution to the development of an entrepreneurship education model that is adaptive, sustainable, and relevant to the demands of the times.

Cultural education initiatives that support this include integrating local wisdom into digital materials, such as modules or case studies based on traditional products and practices, so students learn to utilize technology without losing their cultural roots. Collaborative programs between students and local communities can strengthen practice-based learning while fostering cultural sensitivity. A critical epistemological approach is also important to encourage students to evaluate digital information reflectively, identify biases, and consider cultural impacts. Furthermore, digital storytelling activities based on local culture can hone digital skills while promoting traditional values. With this strategy, entrepreneurship education not only develops digital literacy but also produces graduates who are innovative, globally competent, and remain rooted in local identity, so that technology becomes a means of strengthening culture, not a threat to the sustainability of local values.

6- Declarations

6-1- Author Contributions

Conceptualization, M., D., H.M., and N.R.; methodology, M., D., H.M., and N.R.; software, M., S.S., and S.F.; validation, D., H.M., and N.R.; formal analysis, M., S.S., and S.F.; investigation, D., H.M., and N.R.; resources, M., C.M., and S.K.; data curation, M., S.S., and S.F.; writing—original draft preparation, M.; writing—review and editing, M., D., H.M., and N.R.; visualization, M., C.M., S.S., S.F., and S.T.; supervision, D., H.M., and N.R.; project administration, M., C.M., and S.F.; funding acquisition, M., C.M., S.S., S.F., and S.K. All authors have read and agreed to the published version of the manuscript.

6-2- Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6-3- Funding and Acknowledgments

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6-4- Institutional Review Board Statement

Not applicable.

6-5- Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

6-6- Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

7- References

[1] Haddade, H., Nur, A., Rasyid, M. N. A., & Abd Raviq, R. (2024). Quality assurance strategies of higher education in digital era: an Anthropology of education study in Islamic higher education institution. Quality Assurance in Education, 32(1), 46–63. doi:10.1108/QAE-05-2023-0084.

[2] Hadi Pradana, P., Ketut Agustini, Gede Rasben Dantes, & I Gde Wawan Sudatha. (2024). The Urgency of Digital Literacy Learning in Educational Units: Systematic Literature Review. Child Education Journal, 6(1), 25–33. doi:10.33086/cej.v6i1.6100.

[3] Aver, B., Fošner, A., & Alfirević, N. (2021). Higher education challenges: Developing skills to address contemporary economic and sustainability issues. Sustainability (Switzerland), 13(22), 12567. doi:10.3390/su132212567.

[4] Pham, M., Nguyen, A. T. T., Tran, D. T., Mai, T. T., & Nguyen, V. T. (2023). The impact of entrepreneurship knowledge on students' e-entrepreneurial intention formation and the moderating role of technological innovativeness. Journal of Innovation and Entrepreneurship, 12(1), 80. doi:10.1186/s13731-023-00351-7.

[5] Quraishi, T., Ulusi, H., Muhid, A., Hakimi, M., & Olusi, M. R. (2024). Empowering students through digital literacy: A case study of successful integration in a higher education curriculum. Journal of Digital Learning and Distance Education, 2(9), 667-681. doi:10.56778/jdlde.v2i8.208.

[6] Tian, X., Park, K. H., & Liu, Q. (2023). Deep Learning Influences on Higher Education Students' Digital Literacy: The Meditating Role of Higher-order Thinking. International Journal of Engineering Pedagogy, 13(6), 33–49. doi:10.3991/ijep.v13i6.38177.

[7] Sapta Rini, A. (2024). Determinants of Financial Literacy, Digital Literacy, Internet Penetration and Consumer Confidence Level Mediated by Fintech Growth on Retail Industry Growth in Indonesia. International Journal of Educational Research & Social Sciences, 5(6), 943–952. doi:10.51601/ijersc.v5i6.928.

[8] Guo, S. (2023). Mechanisms of Consumer Purchase Intent Formation in the Context of Live Streaming E-commerce. Journal of Applied Economics and Policy Studies, 1(1), 37–48. doi:10.54254/2977-5701/1/2023004.

[9] Park, K. C., & Lee, S. (2022). Investigating Consumer Innovativeness for New Media Infusion: Role of Literacy in the Context of OTT Services in Korea. KSII Transactions on Internet and Information Systems, 16(6), 1935–1952. doi:10.3837/tiis.2022.06.009.

[10] Fauzi, F., Antoni, D., & Suwarni, E. (2020). Women entrepreneurship in the developing country: The effects of financial and digital literacy on SMEs' growth. Journal of Governance and Regulation, 9(4), 106–115. doi:10.22495/JGRV9I4ART9.

[11] Azizan, F., & Rahim, M. H. L. (2024). A bibliometric analysis on entrepreneurial digital competencies. Journal of Emerging Economies and Islamic Research, 12(2), 3655. doi:10.24191/jeeir.v12i2.3655.

[12] Yağan, S. A., & Parlar, H. (2023). Investigating the Relationships between University Students' Epistemological Beliefs and Learning Approaches: A Path Analysis Study. SAGE Open, 13(2), 1–12. doi:10.1177/21582440231184855.

[13] Lonka, K., Ketonen, E., & Vermunt, J. D. (2021). University students' epistemic profiles, conceptions of learning, and academic performance. Higher Education, 81(4), 775–793. doi:10.1007/s10734-020-00575-6.

[14] Bahcivan, E., Yavuzalp, N., & Kilic, M. (2024). Investigating structural relations among university students' self-efficacy beliefs, epistemological beliefs, and digital literacy skills. World Journal on Educational Technology: Current Issues, 16(3), 146–163. doi:10.18844/wjet.v16i3.8996.

[15] Chan, N. M., Ho, I. T., & Ku, K. Y. L. (2011). Epistemic beliefs and critical thinking of Chinese students. Learning and Individual Differences, 21(1), 67–77. doi:10.1016/j.lindif.2010.11.001.

[16] Kartal, O. Y., Yazgan, A. D., Temelli, D., & Yavuz Kartal, M. (2024). The Impact of Epistemological Beliefs and School Climate on the Sustainability of Critical Thinking Dispositions in Middle School Students. Sustainability (Switzerland), 16(20), 8786. doi:10.3390/su16208786.

[17] Fatma Alkan. (2021). Investigation of Epistemological Beliefs and Creativity Fostering Behaviours of Prospective Teachers' in Terms of Various Variables. MIER Journal of Educational Studies Trends & Practices, 212–226. doi:10.52634/mier/2019/v9/i2/1371.

[18] Metallidou, P. (2013). Epistemological beliefs as predictors of self-regulated learning strategies in middle school students. School Psychology International, 34(3), 283–298. doi:10.1177/0143034312455857.

[19] Jun, F. (2020). Digital Literacy in Chinese Young People's Engagement on Weibo. Beijing International Review of Education, 2(3), 420–434. doi:10.1163/25902539-00203008.

[20] Gu, S., & Laoakka, S. (2024). Digital Innovation in Anhui Phoenix Painting Art: Transforming Educational Literacy in the New Era. International Journal of Education and Literacy Studies, 12(2), 152–160. doi:10.7575/aiac.ijels.v.12n.2p.152.

[21] Wardana, L. W., Narmaditya, B. S., Wibowo, A., Fitriana, Saraswati, T. T., & Indriani, R. (2021). Drivers of entrepreneurial intention among economics students in Indonesia. Entrepreneurial Business and Economics Review, 9(1), 61–74. doi:10.15678/EBER.2021.090104.

[22] Budiman, J. (2020). Entrepreneurial Attitudes and Skills Internalization of Chinese Students'. Jurnal Pendidikan Ekonomi Dan Bisnis (JPEB), 8(1), 43–53. doi:10.21009/jpeb.008.1.5.

[23] Owodunni, A. A. (2022). Entrepreneur education, entrepreneur confidence, cultural supports and gender as predictors of entrepreneurial intention among final-year students of the University of Ibadan. International Journal of Business and Economics Research, 11(3), 102–108. doi:10.11648/j.ijber.20221103.11.

[24] Kholifah, N., Kusumawaty, I., Nurtanto, M., Mutohhari, F., Isnantyo, F. D., & Subakti, H. (2022). Designing The Structural Model of Students' Entrepreneurial Personality in Vocational Education: An Empirical Study in Indonesia. Journal of Technical Education and Training, 14(3), 1–17. doi:10.30880/jtet.2022.14.03.001.

[25] Sun, X., & Usman, M. A. (2024). Pixels to Paychecks: Understanding the Determinant of Latent Entrepreneurial Transition in Digital Context. SAGE Open, 14(4), 21582440241288928. doi:10.1177/21582440241288928.

[26] Yiping, H., & Yongqiang, L. (2011). Notice of Retraction: Product innovation design based on local culture. 2011 International Conference on Product Innovation Management (ICPIM 2011), 363–366. doi:10.1109/ICPIM.2011.5983677.

[27] Sen, S. (2022). Devising A Structural Equation Model of Relations Between Teachers' Goal Orientations, Epistemological Beliefs and Self-Efficacy. MIER Journal of Educational Studies Trends and Practices, 12, 103–121. doi:10.52634/mier/2022/v12/i1/2200.

[28] Chiu, Y. L., Liang, J. C., & Tsai, C. C. (2013). Internet-specific epistemic beliefs and self-regulated learning in online academic information searching. Metacognition and Learning, 8(3), 235–260. doi:10.1007/s11409-013-9103-x.

[29] Ferguson, L. E., Bråten, I., Strømsø, H. I., & Anmarkrud, Ø. (2013). Epistemic beliefs and comprehension in the context of reading multiple documents: Examining the role of conflict. International Journal of Educational Research, 62, 100–114. doi:10.1016/j.ijer.2013.07.001.

[30] Alrubaishi, D., McAdam, M., & Harrison, R. (2021). Culture, Islamic capital and the entrepreneurial behaviour of family firms in Saudi Arabia. International Journal of Entrepreneurial Behaviour and Research, 27(6), 1476–1501. doi:10.1108/IJEBR-09-2020-0575.

[31] Xu, T., Park, K. H., & Tian, X. (2023). Structural Relationship on Factors Influencing Digital Literacy of College Students. International Journal of Emerging Technologies in Learning (IJET), 18(19), 147–159. doi:10.3991/ijet.v18i19.38319.

[32] Jiang, Y. H., Wang, J., Bonner, P., & Yau, J. (2021). A Cross-Cultural Study of Relationships between Epistemological Beliefs and Self-Regulated Learning Strategies. Electronic Journal of Research in Educational Psychology, 19(54), 369–392. doi:10.25115/ejrep.v19i54.3896.

[33] Boucher, S., Cullen, M., & Calitz, A. P. (2024). Culture, entrepreneurial intention and entrepreneurial ecosystems: evidence from Nelson Mandela Bay, South Africa. Journal of Entrepreneurship in Emerging Economies, 16(4), 1183–1211. doi:10.1108/JEEE-05-2022-0156.

[34] EstradaCruz, M., VerdúJover, A. J., & GómezGras, J. M. (2019). The influence of culture on the relationship between the entrepreneur's social identity and decision-making: Effectual and causal logic. BRQ Business Research Quarterly, 22(4), 226–244. doi:10.1016/j.brq.2018.10.002.

[35] Akter, P., Hossain, S., Siddique, M. T., Ayub, M. I., Nath, A., Nath, P. C., Rasel, M., & Hassan, M. M. (2025). Sentiment Analysis of Consumer Feedback and Its Impact on Business Strategies by Machine Learning. The American Journal of Applied Sciences, 07(01), 6–16. doi:10.37547/tajas/volume07issue01-02.

[36] Karyaningsih, R. P. D., Wibowo, A., Saptono, A., & Narmaditya, B. S. (2020). Does entrepreneurial knowledge influence vocational students' intention? Lessons from Indonesia. Entrepreneurial Business and Economics Review, 8(4), 138–155. doi:10.15678/EBER.2020.080408.

[37] Mega, I. R., Yuanita, Y., Arsisari, A., & Ulfah, W. A. (2022). Learners' Digital Literacy in the Online Learning during Covid-19. English Review: Journal of English Education, 10(2), 699–706. doi:10.25134/erjee.v10i2.6314.

[38] Windarto, W., & Martini, M. (2024). Enhancing Digital Literacy through Cultural Value Integration in Krendang Community. International Conference on Community Development (ICCD), 6(1), 208–214. doi:10.33068/iccd.v6i1.762.

[39] Zhou, L., Shafique, H. M., & Ahmad, K. (2025). The development and implementation of strategies for promoting cultural literacy among university students in the digital environment. Information Development, 02666669251314835. doi:10.1177/02666669251314835.

[40] Tinmaz, H., Lee, Y. T., Fanea-Ivanovici, M., & Baber, H. (2022). A systematic review on digital literacy. Smart Learning Environments, 9(1), 21. doi:10.1186/s40561-022-00204-y.

[41] Nazzal, A., Thoyib, A., Zain, D., & Hussein, A. S. (2022). The Effect of Digital Literacy and Website Quality on Purchase Intention in Internet Shopping through Mediating Variable: The Case of Internet Users in Palestine. Webology, 19(1), 2414–2434. doi:10.14704/web/v19i1/web19163.

[42] Kakouris, A., & Liargovas, P. (2021). On the About/For/Through Framework of Entrepreneurship Education: A Critical Analysis. Entrepreneurship Education and Pedagogy, 4(3), 396–421. doi:10.1177/2515127420916740.

[43] Mi'rajiatinnor, D., Abbas, E. W., Rusmaniah, R., Mutiani, M., & Jumriani, J. (2022). Factors Encouraging Entrepreneurship for Students of the Faculty of Teacher Training and Education, Lambung Mangkurat University. The Kalimantan Social Studies Journal, 4(1), 18. doi:10.20527/kss.v4i1.5297.

[44] Kirby, D. A., & El-Kaffass, I. (2021). Harmonious entrepreneurship – a new approach to the challenge of global sustainability. World Journal of Entrepreneurship, Management and Sustainable Development, 17(4), 846–855. doi:10.1108/WJEMSD-09-2020-0126.

[45] Maula, F. I., Murwani, F. D., Hermawan, A., Nasikh, & Wardana, L. W. (2023). Challenges of Business Success in Era of Disruption. Journal of Higher Education Theory and Practice, 23(6), 216–230. doi:10.33423/jhetp.v23i6.5979.

[46] Shultz, M., Nissen, J., Close, E., & Van Dusen, B. (2022). The role of epistemological beliefs in STEM faculty's decisions to use culturally relevant pedagogy at Hispanic-Serving Institutions. International Journal of STEM Education, 9(1), 32. doi:10.1186/s40594-022-00349-9.

[47] Alghamdi, E. (2023). The Explanatory Power of Individual-Level Motivators for Entrepreneurship in Predicting Entrepreneurial Activity: A Cross-Country Investigation. International Journal of Business & Management Studies, 4(1), 01–13. doi:10.56734/ijbms.v4n1a1.

[48] Abdul Rashid, I. M., Faisal, S. I., Nasir, N. M., Wan Husain, W. A. F., Razak, N. A., Abidin, N. Z., & Abu Samah, I. H. (2024). The Moderating of Technological Adoption on Financial Literacy and International Entrepreneur Intention. Journal of Human, Earth, and Future, 5(1), 62–71. doi:10.28991/HEF-2024-05-01-05.

[49] Alfia, N., Sumardi, S., & Kristina, D. (2020). Survival Skills in Digital Era: An Integration of Digital Literacy into EFL Classroom. Indonesian Journal of EFL and Linguistics, 5(2), 435. doi:10.21462/ijefl.v5i2.307.

[50] Okręglicka, M., Filipowicz, A., & Betáková, J. (2021). Students' Entrepreneurial Orientation and Plans of Setting up Business - the Importance of Educational System. Journal of Management, 37(1), 53–57. doi:10.38104/vadyba.2021.1.05.

[51] Mahande, R. D., Abdal, N. M., Nasir, N., & Rahmi, U. (2026). Design and effectiveness of the HyFlex-VR learning model for emancipated learning in higher education. Journal of Applied Research in Higher Education, 18(3), 951-972. doi:10.1108/JARHE-12-2024-0713.

[52] Daud, M. F., Ahmad Fuad Khoo, N. A. K. binti, Osman, S., Wan Hussin, W. N. B., Bin Hanafiah, K. A., & Sumeri, N. A. Z. (2022). The Pattern of Epistemological Belief in Design among Engineering Students. International Journal of Learning and Development, 12(2), 95. doi:10.5296/ijld.v12i2.19897.

[53] Vecaldo, R. T. (2020). Dimensionality and predictive validity of schommer epistemological questionnaire among Philippine pre-service teachers. International Journal of Instruction, 13(2), 767–782. doi:10.29333/iji.2020.13252a.

[54] Lee, S. W. Y., Luan, H., Lee, M. H., Chang, H. Y., Liang, J. C., Lee, Y. H., Lin, T. J., Wu, A. H., Chiu, Y. J., & Tsai, C. C. (2021). Measuring epistemologies in science learning and teaching: A systematic review of the literature. Science Education, 105(5), 880–907. doi:10.1002/sce.21663.

[55] Martins, S., Augusto, C., Martins, M. R. O., José Silva, M., Okan, O., Dadaczynski, K., Duarte, A., Fronteira, I., Ramos, N., & Rosário, R. (2022). Adaptation and validation of the Digital Health Literacy Instrument for Portuguese university students. Health Promotion Journal of Australia, 33(S1), 390–398. doi:10.1002/hpja.580.

[56] Rivadeneira, M. F., Miranda-Velasco, M. J., Arroyo, H. V., Caicedo-Gallardo, J. D., & Salvador-Pinos, C. (2022). Digital Health Literacy Related to COVID-19: Validation and Implementation of a Questionnaire in Hispanic University Students. International Journal of Environmental Research and Public Health, 19(7), 4092. doi:10.3390/ijerph19074092.

[57] Soundararajan, A., Lim, J. X., Ngiam, N. H. W., Tey, A. J. Y., Tang, A. K. W., Lim, H. A., Yow, K. S., Cheng, L. J., Ho, J., Teo, Q. X. N., Yee, W. Q., Yoon, S., Low, L. L., & Ng, K. Y. Y. (2023). Smartphone ownership, digital literacy, and the mediating role of social connectedness and loneliness in improving the wellbeing of community-dwelling older adults of low socioeconomic status in Singapore. PLoS ONE, 18(8), 290557. doi:10.1371/journal.pone.0290557.

[58] Atmojo, I. R. W., Ardiansyah, R., Nafisah, A., Matsuri, M., Saputri, D. Y., & Chumdari, C. (2022). The Effectiveness of Digital Literacy Indicators in Improving Students' Reading Interest. AL-ISHLAH: Jurnal Pendidikan, 14(3), 3007–3018. doi:10.35445/alishlah.v14i3.2123.

[59] Amunga, C. N. (2020). The Impact of Cultural Beliefs on Mental Health: A World View from Selected Communities in Western Kenya. East African Journal of Traditions, Culture and Religion, 2(1), 34–38. doi:10.37284/eajtcr.2.1.21.

[60] Hunt, B., Wilson, C. L., Fauzia, G., & Mazhar, F. (2020). The Muslimah Project: A Collaborative Inquiry into Discrimination and Muslim Women's Mental Health in a Canadian Context. American Journal of Community Psychology, 66(3–4), 358–369. doi:10.1002/ajcp.12450.

[61] Chen, R., & Chen, X. (2024). Cultural sustainability through social networks: a moderated mediation model exploring the psychological dimensions of cultural dissemination. Frontiers in Psychology, 15, 1514693. doi:10.3389/fpsyg.2024.1514693.

[62] Passaro, R., Quinto, I., Rippa, P., & Thomas, A. (2020). Evolution of Collaborative Networks Supporting Startup Sustainability: Evidences from Digital Firms. Sustainability, 12(22), 9437. doi:10.3390/su12229437.

[63] Saadat, S., Aliakbari, A., Alizadeh Majd, A., & Bell, R. (2022). The effect of entrepreneurship education on graduate students' entrepreneurial alertness and the mediating role of entrepreneurial mindset. Education and Training, 64(7), 892–909. doi:10.1108/ET-06-2021-0231.

[64] Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2–24. doi:10.1108/EBR-11-2018-0203.

[65] Syamsiah, Jamaluddin, A. Bin, & Pratiwi, A. C. (2024). Exploring the impact of educational background, spiritual beliefs, and media exposure on environmental knowledge and attitudes. Eurasia Journal of Mathematics, Science and Technology Education, 20(11), 2537. doi:10.29333/ejmste/15644.

[66] Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). Partial least squares structural equation modeling (PLS-SEM) using R: A workbook. Springer, Cham, Switzerland. doi:10.1007/978-3-030-80519-7_4.

[67] Blegur, J., Ma'mun, A., Berliana, Mahendra, A., Alif, M. N., Juliantine, T., & Lumba, A. J. F. (2024). Integrated Learning Models for Micro-Teaching Course. Emerging Science Journal, 8(6), 2480–2500. doi:10.28991/ESJ-2024-08-06-020.

[68] Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135. doi:10.1007/s11747-014-0403-8.

[69] Al-Maroof, R. A. S., & Al-Emran, M. (2018). Student's acceptance of google classroom: An exploratory study using PLS-SEM approach. International Journal of Emerging Technologies in Learning, 13(6), 112–123. doi:10.3991/ijet.v13i06.8275.

[70] Audretsch, D. B., & Belitski, M. (2021). Three-ring entrepreneurial university: in search of a new business model. Studies in Higher Education, 46(5), 977–987. doi:10.1080/03075079.2021.1896804.

[71] Nsereko, I., Mayanja, S. S., & Balunywa, W. (2020). Prior knowledge and social entrepreneurial venture creation: the mediating role of novelty ecosystem. World Journal of Entrepreneurship, Management and Sustainable Development, 17(2), 260–273. doi:10.1108/WJEMSD-04-2020-0031.

[72] Xu, Y. (2024). Research on the Construction Problems of Innovation and Entrepreneurship Education Programs in Higher Vocational Colleges and Universities under the Background of Digital Technology Era. Applied Mathematics and Nonlinear Sciences, 9(1). doi:10.2478/amns.2023.2.01540.

[73] Lu, F., Lu, Z., Luo, M., & Wei, C. (2025). The Influence of Digital Literacy on College Students' Entrepreneurial Opportunity Recognition: The Moderating Role of Innovation and Entrepreneurship Education. Journal of Contemporary Educational Research, 9(6), 243–249. doi:10.26689/jcer.v9i6.10954.

[74] Ji, S., & Zhuang, J. (2023). The Impact Path of Digital Literacy on Farmers' Entrepreneurial Performance: Based on Survey Data in Jiangsu Province. Sustainability (Switzerland), 15(14), 11159. doi:10.3390/su151411159.

[75] Ganefri, Kamdi, W., Makky, M., Hidayat, H., & Rahmawati, Y. (2024). Entrepreneurship Education and Entrepreneurial Intention among University Students: The Roles of Entrepreneurial Mindset, Digital Literacy, and Self-Efficacy. Journal of Social Studies Education Research, 15(4), 85–134. doi:10.3390/su18083985.

[76] Prabowo, H., Ikhsan, R. B., & Yuniarty, Y. (2022). Drivers of Green Entrepreneurial Intention: Why Does Sustainability Awareness Matter Among University Students? Frontiers in Psychology, 13, 873140. doi:10.3389/fpsyg.2022.873140.

[77] Valencia-Arias, A., Arango-Botero, D., & Sánchez-Torres, J. A. (2022). Promoting entrepreneurship based on university students' perceptions of entrepreneurial attitude, university environment, entrepreneurial culture and entrepreneurial training. Higher Education, Skills and Work-Based Learning, 12(2), 328–345. doi:10.1108/HESWBL-07-2020-0169.

[78] Hoang, G., Le, T. T. T., Tran, A. K. T., & Du, T. (2021). Entrepreneurship education and entrepreneurial intentions of university students in Vietnam: the mediating roles of self-efficacy and learning orientation. Education and Training, 63(1), 115–133. doi:10.1108/ET-05-2020-0142.

[79] Andry Echor Panergayo, A., Fajardo Gregana, C., Fe Dimaunahan Panoy, J., & Nocheseda Chua, E. (2023). Epistemological Beliefs and Academic Performance in Physics of Grade 12 Filipino STEM Learners. Jurnal Pendidikan Progresif, 13(1), 16–24. doi:10.23960/jpp.v13.i1.202302.