
Supporting aspects of entrepreneurial interest: an empirical study reviewing creative, strategic, and digital competencies (EI-CSDC)

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ABSTRACT

Entrepreneurship is a crucial pathway to support future livelihoods, but there are obstacles, such as a lack of interest in entrepreneurship. Despite the growing and highly promising potential of digitalization in entrepreneurship, creativity remains a critical factor, and a strategic approach is essential. However, there is still limited information linking creative thinking, strategic thinking, digital competence, and a person's interest in entrepreneurship. To address these gaps, research was conducted to explore the relationships between entrepreneurial interest, digital competence, creative thinking, and strategic thinking. The subjects of this study were students from the Bachelor of Culinary Education Study Program. An ex-post facto model was applied as the research instrument, and path analysis was used for data analysis.

The results revealed that three aspect relationships and two sub-aspects needed to be removed for the proposed model to fit the goodness-of-fit (GOF) criteria. The GOF values include an SRMR of 0.089 and an NFI of 0.710, both indicating a good fit. Additionally, it was found that digital competence (DC) has a significant direct impact on interest in entrepreneurship (IE), with a p-value of 0.000 and an R-squared value of 0.281. Creative thinking (CT) significantly influences digital competence, with a p-value of 0.004 and an R-squared value of 0.381. Strategic thinking (ST) also has a significant direct effect on digital competence, with a p-value of 0.037 and an R-squared value of 0.381. Furthermore, creative thinking indirectly affects digital competence through interest in entrepreneurship, with a significant p-value of 0.044. Similarly, strategic thinking indirectly impacts digital competence through interest in entrepreneurship, with a significant p-value of 0.048. In conclusion, this study empirically demonstrates that aspects of entrepreneurial interest, when supported by digital competence, creative thinking, and strategic thinking, are significantly related.

Keywords: Creative, strategic, digital competency, entrepreneurial interest

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INTRODUCTION

Entrepreneurship is a breakthrough in various sectors, but several challenges arise, such as limited funds, interest, and others. These issues are further complicated by the growth and development of digitalization in Indonesia (Daradkeh, 2023; Prihandono et al., 2024). Digitalization is widely discussed across different fields, including education, and has become a hot topic in many formal and non-formal discussions (Kumar & Nanda, 2022; Meyer et al., 2023; Sampson et al., 2014). References indicate that technological advances can simplify daily

activities and have the potential to significantly impact society in a positive way (Mandala et al., 2023; Oberländer et al., 2020). This is emphasized (Lopez-Brown, 2023) who states that 65.6% of technology influences the social life of its users. However, despite its benefits, the rapid pace of technological advancement raises concerns about how to utilize technology effectively and what knowledge must be mastered, both in education and beyond (Haleem et al., 2022). One essential factor for individuals in entrepreneurship is interest. Interest drives desire, motivation, or ambition, and is closely linked to various aspects such as learning and psychological concepts, as well as to scientific knowledge (Chervet, 2022). This means that interest, when associated with entrepreneurship and digital knowledge or skills (competencies), is highly relevant. This is confirmed by (Bachmann et al., 2024; Setiawati et al., 2022) who state that digital competence is positively and significantly related to entrepreneurial interest, both directly and indirectly, with a p-value of $0.000 < 0.05$.

The concept of digital competency encompasses a broad range of knowledge, skills, and experience (Budai et al., 2023), making it highly suitable for teaching in various formal and non-formal educational institutions. The success of education is an indicator of a country's progress (Syaiful et al., 2021), as stated in the Sustainable Development Goals (SDGs), specifically Goal 4 (Quality Education) (Bappenas, 2023). The 21st century requires every individual to be skilled in the 4Cs and even the 6Cs (Critical Thinking and Problem Solving, Communication, Collaboration, Creativity and Innovation, Character, and Citizenship) (Anggraeni et al., 2022; Khoiri et al., 2021). In relation to entrepreneurship, creativity is a key factor because, in today's world, many people are eager to try new things or products (Kusumaningsih et al., 2024; Nakata et al., 2018; Park & Suzuki, 2021). This is closely tied to ideas, as creativity is the ability to create or discover something new, often involving innovation (Malik et al., 2019). This is confirmed through (Bahri et al., 2023; Lucas, 2020) who find that digital skills and creativity are related and have a positive and significant impact on entrepreneurial interest, with a p-value of $0.000 < 0.05$. Not only creative thinking, but there is also a more complex approach that can contribute to entrepreneurial interest: strategic thinking. This concept is still seldom discussed, though researchers provide examples that adopt this thinking (Wormell et al., 2011). According to them, strategic thinking involves overcoming amateurism and improving the quality of our work by collaborating with other professionals who are passionate about what they do and excel in their fields. Further findings (Williams, 2006) suggest that strategic thinking can benefit users, as it is closely related to the assessment of macro and archival values at the organizational level—whether in government, business, or a department or unit. A new perspective adopted from (Asobee, 2021) reveals that strategic thinking is a continuous process that allows individuals or organizations to gain a competitive advantage and create added value. This is particularly relevant when linked to entrepreneurial interest, as it helps individuals or organizations design effective

strategies to seize opportunities and achieve success. This notion is supported by (Henriquez-Calvo & Díaz-Martínez, 2023) who assert that strategic thinking includes the ability to analyze and assess information to identify or anticipate opportunities and challenges in decision-making. This suggests that creative thinking, digital competence, and entrepreneurial interest are closely interconnected. Although statistical data on the relationship between strategic thinking and these three aspects is limited, the previous discussion indicates that they should indeed be linked to strategic thinking.

There are numerous references to aspects to be studied, such as creative thinking, digital competence, and entrepreneurial motivation. However, specifically in the case of strategic thinking, there are still limited references, and it is crucial to explore several variables, aspects, or indicators related to strategic thinking, rather than focusing solely on strategic thinking itself. Therefore, this research is exploratory and adopts several indicators, resulting in reflective measurement indicators.

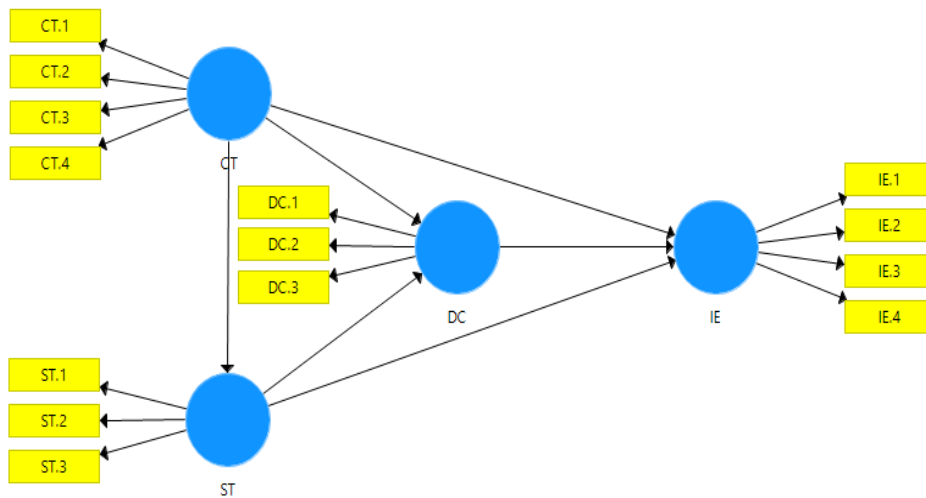
Based on the explanation above, this study aims to analyze various factors related to entrepreneurial interest, such as creative thinking, strategic thinking, and digital competence. The urgency of this research lies in understanding the role these three factors play in determining or influencing an individual's entrepreneurial interest. It is hoped that this research will identify and demonstrate which aspects and sub-aspects are relevant to the study and how they contribute to the final model of entrepreneurial interest within the context of empirical studies.

The key questions in this study are: 1. What is the model of entrepreneurial interest that is empirically validated from the aspects and sub-aspects? 2. What are the influential aspects that determine entrepreneurial interest, as empirically proven?

METHOD

Research Design

This research is a quantitative exploration. Quantitative exploration involves statistical or numerical data that is assigned a number or score (Sugiyono, 2015). Based on data collection methods, this research follows an ex-post facto research design because it aims to identify causes that may lead to changes in behavior, symptoms, or phenomena resulting from an event or behavior, without manipulation by the researchers (Lord, 1973). The following framework or initial research model is described.



Note: CT = Creative Thinking; ST = Strategic Thinking; DC = Digital Competence; IE = Interest Entrepreneurship

Figure 1. Initial model of Proposed Research

Research Procedure

The procedures in this research include three stages: preparation, process, and output/result. First, the preparation stage involves three steps: 1) formulating the problem, 2) formulating hypotheses, and 3) designing the research and questionnaires. Second, the process stage encompasses three steps: 1) distributing the questionnaires, 2) processing the data, and 3) analyzing the data. Third, the output/result stage consists of two steps: 1) drawing conclusions and 2) reporting the research results. Specifically, in the process stage, the steps of data processing and analysis are repeated multiple times until they meet certain criteria. The following is a visualization of the research procedure.

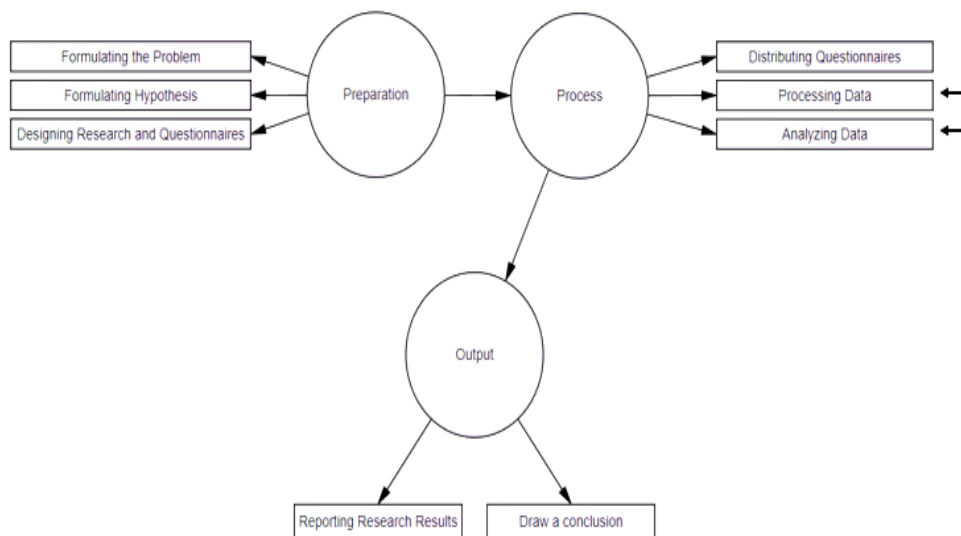


Figure 2. Research procedure

Research Respondents

The sampling technique used in this study was non-probability accidental sampling. This method involves selecting a target population that meets specific criteria, such as ease of accessibility, geographical proximity, availability at a particular time, or willingness to participate (Etikan & Bala, 2017). The criteria for the sample in this study included: 1) the university being located in Yogyakarta, Indonesia; 2) respondents sharing the same major; 3) minimal age differences among participants; 4) availability and willingness to participate; and 5) ease of access for the researchers. As a result, the study included 51 respondents from the Bachelor of Culinary Education Study Program at Yogyakarta State University, all aged between 20 and 24 years. The total population consisted of approximately 200 students from the 2020-2021 cohort, but only 51 participants met the criteria, so all were included as the sample for this study. The following sections provide respondent data based on gender and age.

Table 1. Data of Research Respondents

Respondent's Gender	n	%	Respondent's Age	n	%
Man	4	8%	20-21	40	78%
Woman	47	92%	22-24	11	22%
Total	51	100%	Total	51	100%

Research Instruments

The questionnaire used in this study was distributed via Google Forms and conducted from January 17 to 31, 2024. This study examines four variables: 1) creative thinking, 2) strategic thinking, 3) digital competency, and 4) entrepreneurial interest. The research instruments are described in detail as follows.

Table 2. Research instruments

Variables or Aspects	Indicators or Sub-Aspects	Measurement Scale
Creative Thinking (CT)	Current (CT.1)	Likert Scale (4 - 1)
	Original (CT.2)	
	Fluent (CT.3)	
	Detailed (CT.4)	
Strategic Thinking (ST)	Selection (ST.1)	Likert Scale (4 - 1)
	Assessment (ST.2)	
	Acquisition (ST.3)	
Digital Competence (DC)	Knowledge (DC.1)	Likert Scale (4 - 1)
	Skills (DC.2)	
	Attitude (DC.3)	
Interest Entrepreneurship (IE)	Motivation (IE.1)	Likert Scale (4 - 1)
	Interested (IE.2)	
	Pleased (IE.3)	
	Desire (IE.4)	

Analysis Technique

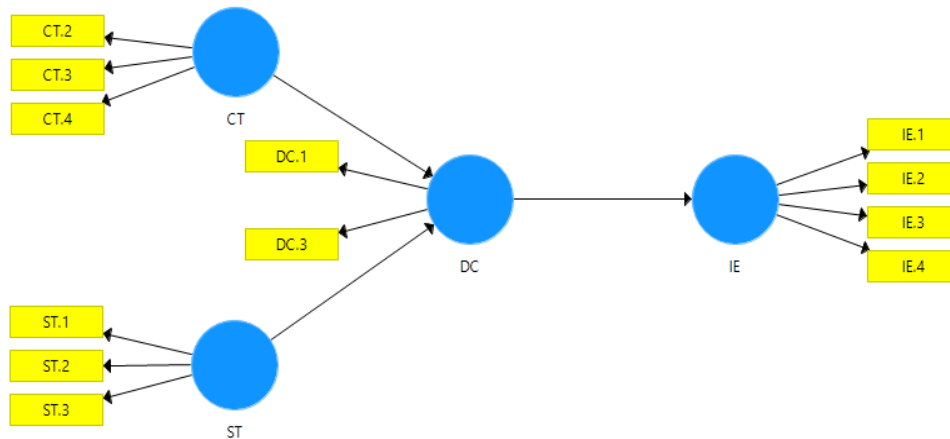
This study utilizes the SmartPLS application for data analysis, as SmartPLS is primarily designed to discover new theories in non-parametric statistics rather than to confirm existing theories (PLS-

SEM). The data analysis employed in this research is path analysis, a statistical technique that determines the influence between variables or aspects within a complex model (Lleras, 2005; Streiner, 2005). To address several questions posed in this study, the researchers will first test multiple variables or aspects using SmartPLS 3 software. Given that this research is exploratory and employs reflective indicators, the decision to determine values in the PLS Algorithm within SmartPLS is based on outer loading, where a parameter value of 0.7 or higher is typically regarded as very satisfactory. However, in exploratory research involving new scales and dimensions, an outer loading above 0.5 is considered acceptable (Chin, 1998). After testing several variables/aspects or indicators/sub-aspects, researchers will look at the value of good of fitness and the R value in this study. SRMR (0 - 0.08) and NFI (0 - 1) values are good of fitness (GOF) (Hu & Bentler, 1999) or the SRMR value should not be above 0.10 (Schermelleh-Engel et al., 2003) and the estimated R value refers to (Hair et al., 2013) with values of 0.75 (substantial), 0.50 (moderate), and 0.25 (weak).

RESULTS AND DISCUSSION

Results

What an Empirically Proven Model of Entrepreneurial Interest Looks Like Looking at Its Aspects and Sub-Aspects



Note: CT = Creative Thinking; ST = Strategic Thinking; DC = Digital Competence; IE = Interest Entrepreneurship

Figure 3. EI-CSDC model

After testing the PLS Algorithm on SmartPLS 70 times. The model is found as shown above because the value of good of fitness (GOF) is adequate, the following findings are described.

Table 3. Good of Fitness (GOF) Value

GOF	Evaluation and Information
SRMR	0.089 (Fit)
NFI	0.710 (Fit)

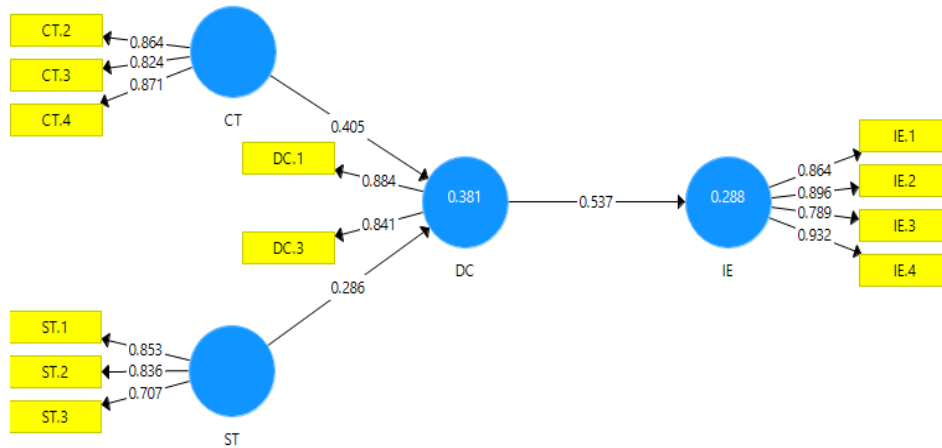
All aspects and sub-aspects, or variables and indicators, based on the outer loading values from the SmartPLS 3 testing, showed values greater than 0.5. However, maintaining these values led to a GOF value that did not meet the required standards. As a result, certain relationships between aspects and sub-aspects need to be eliminated. Specifically, the following relationships are removed: 1) between the aspects of CT and ST, CT and IE, and ST and IE; and 2) among the sub-aspects, specifically from the CT aspect with sub-aspect CT.1 (fluency) and from the DC aspect with sub-aspect DC.2 (skill). This results in the removal of three relationships between aspects and two missing sub-aspects. Below are some of the remaining sub-aspects based on their corresponding GOF values.

Table 4. Outer Loading Values that Match GOF

Variables or Aspects	Indicators/Sub-Aspects and Values
CT	CT.2 (0.864)
	CT.3 (0.824)
	CT.4 (0.871)
ST	ST.1 (0.853)
	ST.2 (0.836)
	ST.3 (0.707)
DC	DC.1 (0.884)
	DC.3 (0.841)
IE	IE.1 (0.864)
	IE.2 (0.896)
	IE.3 (0.789)
	IE.4 (0.932)

Note: CT = Creative Thinking; ST = Strategic Thinking; DC = Digital Competence; IE = Interest Entrepreneurship

As explained earlier, the model has been tested 70 times, and the findings indicate the following: 1) The creative thinking (CT) aspect consists of three sub-aspects: CT.2, CT.3, and CT.4; 2) The strategic thinking (ST) aspect includes three sub-aspects: ST.1, ST.2, and ST.3; 3) The digital competence (DC) aspect has two sub-aspects: DC.1 and DC.3; and 4) The entrepreneurial interest (IE) aspect comprises four sub-aspects: IE.1, IE.2, IE.3, and IE.4. Furthermore, the researcher presents a visualization of the outer loading values from the SmartPLS 3 test results.



Note: CT = Creative Thinking; ST = Strategic Thinking; DC = Digital Competence; IE = Interest Entrepreneurship

Figure 4. Visualization of Outer Loading Value of Smartpls 3 Testing

What are the influences of several aspects to determine entrepreneurial interest that are empirically proven

After identifying the appropriate model and values based on several goodness-of-fit (GOF) categories, we conducted a hypothesis test. This test was performed using bootstrapping in Smart PLS 3, executed 20 times, and the results are summarized in the description below.

Table 5. Hypothesis Test Results

Hypothesis	Direct	Indirect	P-Values and Informations	R ² and Informations
Hypothesis 1	DC → IE	-	0.000 < 0.5 (sig)	0.288 (moderate)
Hypothesis 2	CT → DC	-	0.004 < 0.5 (sig)	0.381 moderate)
Hypothesis 3	ST → DC	-	0.037 < 0.5 (sig)	0.381 (moderate)
Hypothesis 4	-	CT → DC → IE	0.044 < 0.5 (sig)	-
Hypothesis 5	-	ST → DC → IE	0.048 < 0.5 (sig)	-

Note: CT = Creative Thinking; ST = Strategic Thinking; DC = Digital Competence; IE = Interest Entrepreneurship

Based on the table above, the findings can be summarized as follows: The relationship between Digital Competence (DC) and Entrepreneurial Interest (IE) is significant at 0.000 (sig), indicating that the first hypothesis is accepted. The R-squared value is 0.288 (moderate), suggesting that other factors contributing to this value are not addressed in this study. Similarly, the relationship between Creative Thinking (CT) and Digital Competence (DC) is significant at 0.004 (sig), meaning the second hypothesis is accepted. The R-squared value is 0.381 (moderate), indicating that other factors may explain this value beyond the scope of this study. The relationship between Strategic Thinking (ST) and Digital Competence (DC) is significant at 0.037 (sig), confirming the acceptance of the third hypothesis. The R-squared value is again 0.381 (moderate), which implies that additional factors may influence this value but are not explored in this research. The

indirect effect of Creative Thinking (CT) on Digital Competence (DC) through Entrepreneurial Interest (IE) is significant at 0.044, indicating that the fourth hypothesis is accepted. This suggests that digital competence mediates the relationship between creative thinking and entrepreneurial interest. Similarly, the indirect effect of Strategic Thinking (ST) on Digital Competence (DC) through Entrepreneurial Interest (IE) is significant at 0.048, meaning that the fifth hypothesis is accepted. This finding indicates that digital competence also mediates the relationship between strategic thinking and entrepreneurial interest.

Discussion

Based on the findings above, it can be concluded that three variables or aspects—Creative Thinking (CT), Strategic Thinking (ST), and Digital Competence (DC)—support a person's Entrepreneurial Interest (IE). However, it is important to highlight that these supporting aspects and sub-aspects cannot fully measure IE. For instance, the relationships between the variables/aspects, such as CT to ST, CT to IE, and ST to IE, show variability. Additionally, specific indicators or sub-aspects, such as CT.1 (fluency) under the CT aspect and DC.2 (skills) under the DC aspect, fail to meet the Goodness-of-Fit (GOF) criteria. While the relationships among the three aspects and the two sub-aspects have Outer Loadings above 0.5, maintaining these relationships could hinder the model's interpretability, as they do not align with the GOF value. Therefore, this discrepancy is intriguing and warrants further discussion.

Creative Thinking (CT) is closely related to ideas and innovation. The novel and motivating elements of ideas make creative and innovative thinking interlinked, as both focus on product development (Avcı & Yildiz Durak, 2023). Indicators or measurements of creative thinking typically encompass four dimensions: fluency, originality, flexibility, and elaboration (Trisnayanti et al., 2020). Fluency refers to a person's thought process, specifically the ability to generate a large number of ideas in response to open-ended questions. Originality involves the capacity to create new and unusual concepts, often linked to generating uncommon or rare options and forming unique combinations of elements that others may not have considered. Flexibility denotes the ability to shift one's thinking or perspective, while elaboration pertains to developing richer, more engaging, and more comprehensive ideas by integrating details and expanding concepts. However, the fluency sub-aspect (CT.1) did not meet the Goodness-of-Fit (GOF) criteria, which raises questions about its contribution to the model. One potential reason is that the respondents may not be accustomed to generating multiple ideas under pressure. Supporting this, (Megawan & Istiyono, 2019), suggest that fluency can be divided into three aspects within the C5 (evaluate) and C6 (create) levels of Bloom's Taxonomy: summarizing answers, generating ideas, and critiquing objects or situations. Thus, based on these findings, it appears that the respondents have not fully met these criteria.

Digital competence (DC) involves using technology confidently and critically for work, leisure, and communication. It is underpinned by basic ICT skills, which include the use of computers to retrieve, assess, store, create, present, and exchange information, as well as to communicate and participate in collaborative networks over the Internet (Spante et al., 2018). Then most workplaces require at least basic digital competencies (Gallardo-Echenique et al., 2015). making it appropriate to associate DC with knowledge, skills, and attitudes. However, the skills sub-aspect (DC.2) did not meet the goodness-of-fit (GOF) criteria, and there are several reasons that might explain why it was unable to contribute to the model. One possibility is that while respondents may possess the knowledge and attitudes to embrace technological advances, they may still struggle with implementation due to stiffness and unfamiliarity, resulting in a gap in their skills application. One solution is to engage in regular activities related to technology, as skills can be honed through consistent practice (Indra et al., 2023).

Digital Competence (DC) has a significant impact on Entrepreneurial Interest (IE), with a medium R-square value. This indicates that digital competence can effectively support an individual's interest in entrepreneurship. Supporting this, (Singh & Dwivedi, 2022), confirm that Digital Entrepreneurship Competence (DEC) significantly influences Digital Entrepreneurial Intention (DEI), with Entrepreneurial Motivation (EM) mediating the relationship between DEC and DEI. Therefore, implementing practices or training related to this area would be highly relevant, considering the current trends. Further reinforcing this perspective, (Chen & Ifenthaler, 2023; Wang et al., 2021), highlight the need for schools and colleges to enhance the quality of entrepreneurship education and reshape their views on professional status and entrepreneurial practice. They suggest that online practice programs, for instance, can help improve various entrepreneurial and digital sub-competencies.

Creative Thinking (CT) has a significant impact on Digital Competence (DC), as indicated by a moderate R-squared value. This suggests that creative thinking supports an individual's digital competence. Previous studies have shown that, even when individuals possess sufficient digital skills, they often rely more on transversal skills such as entrepreneurship and creativity (Guillén-Gámez et al., 2023). Therefore, creativity plays a crucial role in enhancing an individual's digital competence. Moreover, creativity is one of the key aspects of the 21st century and is closely tied to innovation. By nurturing both of these skills, we can enhance human potential by fostering the positive attributes of individuals (Nakano & Wechsler, 2018).

The relationship between Strategic Thinking (ST) and Digital Competence (DC) is significant, with a moderate R-squared value. This indicates that strategic thinking can effectively support an individual's digital competence. These findings align with those of (Thahrim et al., 2023), who report a significance level of 0.000 between the variables, confirming their significance. Strategic thinking is closely related to company policies, with communication being a key component.

(Afridi et al., 2023) further highlight that user behavior regarding the adoption of digital communication tools falls into a high category, demonstrating that these tools positively impact project performance. Moreover, ease of use significantly moderates the relationship between digital communication tools and an individual's project performance within the company. (Lacarcel & Huete, 2023) illustrate that when considering technology, various aspects come into play, including social network relationships, digital marketing, virtual reality, and augmented reality.

Indirectly, Creative Thinking (CT) and Strategic Thinking (ST) significantly contribute to Digital Competence (DC) through Entrepreneurial Interest (EI). This suggests that when aspects of digital competence are paired with creative and strategic thinking, they can enhance an individual's interest in entrepreneurship. While many other factors support entrepreneurial interest, this study demonstrates that the presence of creative and strategic thinking, combined with adequate digital competence, strengthens an individual's entrepreneurial interest. This, in turn, serves as valuable preparation for working in various organizations and contexts.

CONCLUSION

The proposed model, named EI-CSDC, has undergone empirical testing; however, it remains statistical and requires further development to strengthen its contributions to scientific advancement. The findings indicate that an individual's entrepreneurial interest can be demonstrated through creative and strategic thinking, as well as possessing digital competencies, both directly and indirectly. Nevertheless, further research involving a larger population or sample is strongly recommended to address certain values that do not align with the goodness of fit (GOF). Additionally, incorporating more specific aspects and informants is advisable to enhance and expand these findings.

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