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Research Article

The Role Of Financial Literacy On Technopreneurial Self-Efficacy And Technopreneurship Intention Of Non-Business Students: A Test Of Moderation

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ABSTRACT

This study explored the moderating role of financial literacy (FL) on the relationship between technopreneurial self-efficacy (TSE) and technopreneurship intention (TI) among non-business students from four State Universities and Colleges in the Caraga Region. Using a descriptive, quantitative, non-experimental, and correlational research design, a sample of four hundred randomly selected respondents was surveyed using standardized questionnaires. Frequency, percentage, mean, Pearson correlation, and hierarchical multiple regression analysis were used to analyze the data. Results indicated that students exhibited consistently high levels of TSE, TI, and FL. Significant positive correlations were found among the three variables, with TSE showing a strong positive relationship with TI. FL likewise exhibited strong correlations with TSE and moderate correlations with TI. Regression analysis confirmed that TSE remained the primary direct predictor of TI, while FL contributed additional explanatory power. Although FL was initially examined as a potential moderating variable, the statistical analysis revealed that it did not have a significant moderating effect. Instead, it functioned as a direct independent predictor of TI. These findings highlight the need for integrated educational strategies that build both entrepreneurial confidence and financial competence to better equip students for future technology-driven ventures.

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INTRODUCTION

As the Philippines strives to unlock its potential for sustainable economic growth, it is important to encourage new-age entrepreneurs to embark on an evolving breed of entrepreneurship called technopreneurship, which combines entrepreneurial mindset and technological ideas and skills. However, despite efforts to integrate technopreneurship into university curricula, there still persist several challenges, especially in the development of competitive technopreneurs. Though many students are digitally literate and creative, they find it difficult to turn innovative ideas into viable technology-based businesses.

Educational institutions continue to face difficulties in bridging the gap between theoretical knowledge and practical application. This challenge is particularly evident in regions like Caraga, where entrepreneurial activity is notably low. According to the Department of Trade and Industry (DTI, 2023), Caraga Region accounts for only 2.19% of the country's MSMEs, despite MSMEs making up 99.63% of all businesses. Similarly, a study by Rivera and Gozun (2019) found that 86.12% of 5,953 surveyed youth preferred permanent, short-term, or unclassified jobs over self-employment (9.71%), indicating a preference among young Filipinos for traditional employment rather than entrepreneurship.

This trend is mirrored in technopreneurship as well, as Koe, Alias, Marmaya, Majid, and Mohamad (2020) find that students from non-business backgrounds are less likely to choose technopreneurship as a career, with a majority (36.11%) of all respondents rating their intention to pursue technopreneurship as neutral. Even business graduates show a similar reluctance, with Valenzuela (2022) reporting that 47.06% of business graduates enter private employment, and only 8.82% venture into technopreneurship, even after exposure to university business incubators. This lack of technopreneurial intention hinders the country’s ability to cultivate future leaders in technology-driven industries, despite the growing need for innovation to remain competitive in the global market.

In light of the evolving virtual world, superior technopreneurship is critical in generating more advanced technology, bridging barriers between countries, cultures, and civilizations, and reshaping the world (Abbas, 2018). To meet this demand, developing students into future leaders who value the necessity of technopreneurship is vital in today's ever-changing global business landscape (Okorie, Kwa, Olusunle, Akinyanmi, & Momoh, 2014). However, as Abbas (2018) points out, developing technopreneurs is not as simple as producing a commodity because it requires extraordinary intelligence, proficiency, and advanced programs to produce "strategic thinkers" in a competitive dynamic environment.

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To begin this process, understanding entrepreneurial intention plays a foundational role, because a person shows a certain level of intention before embarking on entrepreneurship (Koe, Mahphoth, Alias, Krishnan, & Arham, 2021). Research by Krueger Jr, Reilly, and Carsrud (2000) further supports this, indicating that intention is a reliable predictor of human behavior in a variety of situations, and many consider it to be the most successful predictor of human attitudes and action. In fact, studies suggest that the stronger the entrepreneurial intention, the more likely individuals are to pursue entrepreneurial activities (Hisrich, Peters, & Shepherd, 2017), a concept that directly applies to technopreneurship as well (Koe et al., 2021).

Based on the issues identified, there appears to be a mismatch between students' technical potential and their entrepreneurial action. This underscores the need to understand what drives or hinders technopreneurial intention among non-business students particularly whether technopreneurial self-efficacy plays a significant role, and whether financial literacy enhances this intention. Building on this gap, the study aims to contribute meaningful insights that can guide education, policy, and practice in designing more targeted and responsive interventions. Without addressing these psychological and financial readiness gaps, efforts to develop competitive technopreneurs at the community and institutional levels may remain ineffective.

To boost technopreneurship, it is necessary to examine predictors such as technopreneurial self-efficacy, which may influence an individual's intention for a new business venture, particularly among young people (Soomro & Shah, 2021). Individual self-efficacy has a significant and positive effect on one's intention to become a technopreneur. Technopreneurial self-efficacy and technopreneurial learning, in particular, have a significant direct and positive influence on technopreneurial intention (Hoque, Awang, & Siddiqui, 2017). Moreover, a high level of technopreneurial self-efficacy strengthens beliefs, capabilities, and skills needed to initiate a business and helps address societal issues (Soomro & Shah, 2021).

Entrepreneurs and technopreneurs alike must have strong beliefs in their skills and abilities in order to launch a new venture (Urban 2010). If an entrepreneur believes in his ability to complete the tasks of launching a new project, he will most likely push himself to take on and overcome new challenges until he succeeds (Al Issa, Abdelsalam, & Omar, 2019). The study of Çankır (2017), also discovers that students with higher self-efficacy have higher entrepreneurship aspirations and that self-efficacy positively influences entrepreneurship desire.

In universities and other educational settings, cultivating financial knowledge, numeracy skills, and self-confidence is crucial to encourage business startups (Rodriguez, 2022). A study conducted by Ruiz-Dotras and Lladós-Masllorens (2022) indicates that self-efficacy, alongside financial and numeracy skills, positively influences entrepreneurial

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intentions. While lower financial literacy may reduce the inclination to start a new venture, simply possessing high financial literacy is not enough to drive entrepreneurial intentions. Instead, perceived entrepreneurial competence is the primary determinant for pursuing a new business endeavor. These findings support the hypothesis of their study that greater entrepreneurial self-efficacy leads to higher entrepreneurial intentions, with financial and numeracy skills also playing a significant role.

The study of Aprilia, Surjanti, and Susanti (2024) further highlights that financial literacy alone does not guarantee entrepreneurial success, as students with high financial literacy but low self-confidence are less likely to exhibit strong entrepreneurial behavior. This is supported by Rehman, Arif, Gul, and Raza (2022), who assert that self-efficacy also drives positive entrepreneurial behavior. While limited studies explore the link between financial literacy and entrepreneurial self-efficacy, some findings reveal a positive relationship. Anggraini and Handayati (2023) report that the interaction between financial literacy and self-efficacy enhances entrepreneurial interest. Similarly, financial literacy is found to significantly relate to general self-efficacy (Sarsale, 2021) and has a moderate, positive, and significant effect on entrepreneurial self-efficacy, accounting for 47.3% of its variance (Tekin & Asar, 2021).

Because all economic behavior has financial implications, entrepreneurs must be financially literate to make economic decisions. A lack of financial literacy and limited access to financial resources can hinder entrepreneurial motivation (Korutaro Nkundabanyanga, Kasozi, Nalukenge, & Tauringana, 2014). Operating a technology-based firm entails higher costs, requiring founders to possess financial literacy, negotiation skills, and strategic planning to secure funding (Atherton, 2012). Financial literacy is critical, especially given evidence that a lack of funds is a barrier to starting new businesses (Li & Qian, 2020). It also supports the development of entrepreneurial skills, such as recognizing and seizing on market opportunities (Evans & Jovanovic, 1989), and improves financial decision-making, including investment choices and the use of financial products (Gilenko & Chernova, 2021; Hogarth & Hilgert, 2002).

However, a study conducted by Alshebami and Al Marri (2022) discovers an intriguing result. It is reported that the financial literacy does not always translate into entrepreneurial intention among potential entrepreneurs, an unexpected finding not commonly reported in previous literature. While some may intend to start small ventures, external barriers such as weak institutional support or lack of financial assistance may discourage them. This highlights the importance of financial support and fostering a culture of saving. The finding may also be attributed to their limited financial literacy, which may be insufficient to shift their mindset and behavior. According to their study, there is no correlation between financial literacy and entrepreneurial intention.

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The notion of being an entrepreneur is becoming increasingly appealing to students as a viable pathway into the labor market (Ainul, Norida, Sudirman, & Mahfuz, 2012). Majority of new venture possibilities exist across nearly all academic fields; however the majority of entrepreneurship initiatives continue to be concentrated in business schools and designed primarily for business students (Hisrich, 1988; Roebuck & Brawley, 1996). In fact, most research on entrepreneurial intention among university students focuses solely on business students (Teixeira, 2008), reinforcing the perception that entrepreneurship is best suited for those with formal business training.

This narrow focus presents a critical gap in understanding how non-business students engage with emerging forms of entrepreneurship, such as technopreneurship, which require not only technical knowledge but also the confidence and financial capability to turn innovative ideas into viable ventures. Addressing this gap is especially relevant in regions like Caraga, where encouraging inclusive and interdisciplinary approaches to entrepreneurship could help boost local economic development. Understanding the influencing factors for non-business students enables universities to create inclusive programs that empower all students to pursue technopreneurship, ultimately contributing to the broader entrepreneurial agenda of establishing and sustaining new business while advancing institutional objectives.

The study investigates the moderating role of financial literacy on the relationship between technopreneurial self-efficacy and technopreneurship intention among non-business students at State Universities and Colleges (SUCs) in the Caraga Region. Specifically, it aims to: (1) measure the level of technopreneurial self-efficacy among non-business students at SUCs in the Caraga Region; (2) assess the level of technopreneurship intention among non-business students at SUCs in the Caraga Region; (3) identify the level of financial literacy among non-business students at SUCs in the Caraga Region; (4) examine the significant direct relationships among technopreneurial self-efficacy, technopreneurship intention, and financial literacy; and (5) explore whether financial literacy moderates the relationship between technopreneurial self-efficacy and technopreneurship intention.

The hypothesis of the study is tested at 0.01 level of significance stating that: (1) technopreneurial self-efficacy does not significantly relate to technopreneurship intention of non-business students at SUCs in the Caraga Region; (2) financial literacy does not significantly relate to technopreneurial self-efficacy of non-business students at SUCs in the Caraga Region; and (3) financial literacy does not significantly relate to technopreneurship intention of non-business students at SUCs in the Caraga Region.

The theoretical underpinning of this study is the Theory of Planned Behavior (TPB) of Icek Ajzen (1985). The theory is an extension of the Theory of Reasoned Action (TRA) and is more applicable when the likelihood of success and actual control over the

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performance of a behavior are suboptimal. In addition to attitudes and subjective norms, which compose the TRA, the main contribution of the TPB is the concept of Perceived Behavioral Control, which is described as an individual's perception of the ease or difficulty of doing a certain behavior (Ajzen, 1987).

The TPB emphasizes that perceived behavioral control is one of the factors influencing behavioral intention. According to Fishbein and Capella (2006), perceived behavioral control is the same as self-efficacy. The attitude, subjective norms, and perceived behavioral control all influence the level of intention of an individual. The more entrepreneurial intention a person has, the greater the likelihood that he or she will become an entrepreneur (Hisrich et al., 2017). The theory helps justify how intention, not just education, is a key step toward developing competitive technopreneurs.

To further support the framework, this study draws from Social Cognitive Theory (SCT) by Albert Bandura (1986), which explains that self-efficacy, or a person's confidence in their ability to succeed, greatly influences behavioral control and future actions (Praswati, Sari, & Murwanti, 2022). Simply put, people with high self-efficacy are more likely to perform tasks, while those with low self-efficacy are less likely to act (McGee, Peterson, Mueller, & Sequeira, 2009; Newman, Obschonka, Schwarz, Cohen, & Nielsen, 2019). This suggests that even if individuals possess the required skills or knowledge, they may not act unless they believe they are capable of succeeding. This is especially relevant for non-business students who, despite having technical skills, often lack the entrepreneurial confidence to transform their ideas into viable ventures.

Interestingly, a recent study by Kampumure (2023) found a strong positive relationship between self-efficacy and financial literacy, supporting the view of Bandura (1999) that individuals equipped with the right tools and knowledge are better at identifying opportunities and achieving favorable outcomes. In this context, financial literacy enhances perceived behavioral control, enabling students to manage risks, make informed decisions, and handle the complexities of running a business. Conversely, a lack of financial literacy may hinder entrepreneurial intention, even in the presence of high self-efficacy.

The independent variable of the study is technopreneurial self-efficacy with the following six theoretical dimensions (De Noble, Jung, & Ehrlich, 1999): developing new product or market opportunities, building an innovative environment, initiating investor relationships, defining core purpose, coping with unexpected challenges, and developing critical human resources. Due to the scarcity of studies focusing on technopreneurial self-efficacy (Ainul et al., 2012), the entrepreneurial self-efficacy construct is adapted incorporating attributes related to innovation, new ideas, and technology to reflect technopreneurs' perceived ability to perform entrepreneurial tasks in a technology-oriented context and is referred to as technopreneurial self-efficacy (TSE).

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Meanwhile, the dependent variable is technopreneurship intention. Technopreneurship intention is a subset of entrepreneurship intention (Lee, Wong, Der Foo, & Leung, 2011); both involve a person's belief in his or her determination and planning to launch a business at some point (Molino, Dolce, Cortese, & Ghislieri, 2018; Ozaralli & Rivenburgh, 2016). The entrepreneurial intention of a person can be viewed from four dimensions (Handaru, Parimita, & Mufdhalifah, 2015): desires, preferences, plans, and behavior expectancies.

Another variable, namely the financial literacy, is used as a moderating variable in this study. Financial literacy refers to the blend of awareness, knowledge, skills, attitudes, and behaviors essential for making informed financial choices and ultimately attaining personal financial well-being (Atkinson & Messy, 2011). This definition is utilized by the OECD-INFE in creating an assessment tool that centers on three key dimensions of financial literacy: financial knowledge, financial attitude, and financial behavior (Atkinson & Messy, 2012).

At the global level, this study contributes to several United Nations Sustainable Development Goals (SDGs), including SDG 1 (No Poverty), SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), and SDG 17 (Partnerships for the Goals). It supports SDG 4 by promoting inclusive, future-ready education that builds entrepreneurial and financial skills, which in turn advances SDG 8 by fostering youth employment and innovation-driven businesses. The focus on technopreneurship aligns with SDG 9 through its emphasis on innovation and infrastructure, particularly in underserved regions like Caraga. By enabling income generation and job creation, the study also indirectly supports SDG 1 in reducing poverty. Lastly, it contributes to SDG 17 by encouraging collaboration among educational institutions, government agencies, and industry stakeholders to achieve sustainable development.

These global implications translate meaningfully into local action, especially for institutions shaping education, economic development, and entrepreneurial ecosystems. In the Philippines, the study provides valuable feedback for program coordinators and curriculum developers in integrating technopreneurship subjects into the current curriculum of various programs in SUCs across the Caraga Region, specifically on non-business courses. Government agencies such as DTI, DOST, CHED, and DICT may also use the findings when planning entrepreneurship development programs and youth training initiatives.

Local government units and youth organizations may also benefit from the study in creating projects that promote youth engagement in tech-driven startups. Moreover, it serves as a reference for startup incubators, accelerators, and mentorship programs that

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support student ventures. Lastly, the study contributes to the growing body of knowledge in the field of entrepreneurship education and serves as a guide for future researchers who wish to explore similar topics, expand the study to other regions, or test additional factors that may influence technopreneurial intention.

METHODS

This section provided a detailed outline of how the study was conducted. It consisted of the following components: research respondent; materials and instrument; and design and procedure.

Study Participants/Research Subject

Mueller (2004) noted that university students had a high potential to become future entrepreneurs. However, most studies have focused on business students (Teixeira, 2008), despite arguments that entrepreneurship education could and should also target non-business students (Hynes, 1996). As a result, the respondents of this study were non-business students who were pursuing their undergraduate studies at four SUCs in the Caraga Region, namely Agusan del Sur State College of Agriculture and Technology (ASSCAT), Caraga State University (CSU), North Eastern Mindanao State University (NEMSU), and Surigao del Norte State University (SNSU).

Based on the official data gathered from the Office of the Registrar of the four identified SUCs, the total population of potential respondents for this study was 1,632 students. According to Te, Castro, Lelis, and Sabanal (2019), a sample size of at least 100 respondents was recommended, but this study followed Andrew Fisher's formula, utilizing 400 non-business students. This sample was prorated across the identified SUCs based on their respective populations and selected randomly to ensure objectivity and representation.

The majority of respondents were aged 21 to 23 and were predominantly male, reflecting the common demographic profile of students enrolled in technical fields. Most participants came from CSU, while NEMSU had the fewest, due to limited programs in its main campus offering the Technopreneurship subject. In terms of academic programs, the highest proportion were enrolled in Engineering, followed by Industrial Technology and Information Technology. A large number of respondents were already in their third or fourth year of study and had taken the Technopreneurship course, indicating sufficient academic exposure to entrepreneurial concepts.

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Interestingly, over 70% had prior entrepreneurial exposure; 79 students (19.75%) had previously run a business, while 204 (51.00%) had participated in entrepreneurship-related activities. These experiences likely enhanced their confidence and interest in exploring technology-based ventures, providing essential context for analyzing their technopreneurial intentions. All the participants were required to provide informed consent and could withdraw at any point for personal reasons, discomfort, or unwillingness, without academic consequences.

Materials/Instruments

To elicit responses from the selected participants, a standardized survey questionnaire was used consisting of four sections: demographics, technopreneurial self-efficacy (independent variable), technopreneurship intention (dependent variable), and financial literacy (moderating variable). Section A included questions about demographic information such as age, gender, educational institution, degree program, academic year or level, technopreneurship course status, and prior entrepreneurial exposure.

All of the items used in this study were adapted from previous studies, with some modified to fit the needs of the current study. Section B assessed technopreneurial self-efficacy using a modified version of the instrument of De Noble et al. (1999). It included seven items on developing new product and market opportunities, five on building an innovative environment, four on coping with unexpected challenges, and three each on initiating investor relations, defining core purpose, and developing critical human resources.

Section C measured technopreneurship intention using the Entrepreneurial Intention Questionnaire (Liñán & Chen, 2009), adapted to reflect the four dimensions of technopreneurial intentions outlined by Van Gelderen, Brand, Van Praag, Bodewes, Poutsma, and Van Gils (2008): desires, preferences, plans, and behavior expectancies, with three items per dimension. Section D measured financial literacy using constructs from Banthia and Dey (2022), based on the OECD/INFE Toolkit (Organisation for Economic Co-operation and Development [OECD], 2022), comprising seven items each for financial knowledge, financial behavior, and financial attitude. All items across Sections B, C, and D were rated using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

To analyze responses, mean scores were interpreted following the mean interpretation scale of Pimentel (2010): 1.00–1.79 (Very Low), 1.80–2.59 (Low), 2.60–3.39 (Moderate), 3.40–4.19 (High), and 4.20–5.00 (Very High).

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The instrument was validated by expert validators, receiving an average rating of 4.71 indicating that the instrument was deemed highly acceptable and appropriate for data collection. Pilot testing was then conducted with 30 non-business students who had taken or were enrolled in the Technopreneurship course. The instrument, comprising 58 items, yielded a Cronbach's Alpha of 0.938, exceeding the acceptable threshold of 0.70 (George & Mallery, 2003), indicating strong internal consistency. Thus, the instrument was deemed highly reliable and that all the items in the questionnaire were appropriate to be retained for the continuation of the study.

Design and Procedure

This study employed a descriptive, quantitative, non-experimental, and correlational research design. A descriptive approach enabled the researcher to gather data directly from respondents on the variables of interest (Te et al., 2019). Quantitative methods were selected for their effectiveness in measuring independent and dependent variables with the highest efficiency and variety (Matveev, 2002), while the non-experimental nature suited the study since no conditions experienced by the participants were manipulated (Frey, 2018). Furthermore, a correlational technique was employed to examine the relationships among technopreneurial self-efficacy, technopreneurship intention, and financial literacy.

To collect data, a formal letter of request was sent to SUC Presidents in the Caraga Region for approval to conduct the survey. Once granted, the researcher personally distributed and retrieved the questionnaires. Ethical protocols were observed throughout the process. Accomplished survey questionnaires were securely collected and subjected to statistical analysis under the supervision of a qualified statistician endorsed by the university. Finally, the statistical results were carefully analyzed and interpreted, and the conclusions and recommendations were developed based on the findings of the study.

To address the objectives of the study, appropriate statistical tools were employed for the analysis and interpretation of data including mean (M) and standard deviation (SD), Pearson (r), and Multiple Regression Analysis (MRA), specifically hierarchical (stepwise) regression approach. While the study initially intended to test the moderating effect of financial literacy, the results of the statistical testing did not support this. As a result, moderation testing was not pursued in the final model and recommended for future research. The regression analysis focused solely on the predictive strength of technopreneurial self-efficacy and financial literacy.

Before data collection, ethical approval was secured from the University of Mindanao Ethics Review Committee (UMERC-2024-417). Informed consent was obtained through a clear written form outlining the study's purpose, procedures, and participants' rights. Recruitment focused on non-business students who had taken the

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Technopreneurship subject, with proper approvals from SUC Presidents, Deans, and instructors. Privacy and confidentiality were strictly observed in compliance with the Data Privacy Act of 2012, with data securely stored and accessed only by authorized personnel. The study also ensured proper authorship credit, avoided fabrication, and declared any potential conflict of interest in the COI Statement submitted to UMERC.

RESULTS AND DISCUSSION

This section presents the results of the study and provides a comprehensive discussion of the findings aligned with the research objectives.

Table 1
Descriptive Statistics for Technopreneurial Self-Efficacy (TSE)

Dimension	Mean (M)	SD	Interpretation
1. Developing New Product and Market Opportunities	3.530	0.626	High
2. Building an Innovative Environment	3.649	0.663	High
3. Initiating Investor Relationships	3.489	0.664	High
4. Defining Core Purpose	3.618	0.692	High
5. Coping with Unexpected Challenges	3.523	0.691	High
6. Developing Critical Human Resources	3.410	0.749	High
Overall Technopreneurial Self-Efficacy	**3.536**	**0.564**	**High**

Table 1 showed that non-business students at SUCs in the Caraga Region exhibited high TSE across all six dimensions, with an overall mean of 3.536. This suggests that, in general, non-business students have a strong sense of self-efficacy regarding their ability to engage in technopreneurial activities. The dimension with the highest mean score was Building an Innovative Environment (M = 3.649), while Developing Critical Human Resources (M = 3.410) had the lowest mean score. However, it is important to note that the small gap between the highest and lowest scores indicates a consistently strong belief in their technopreneurial abilities.

The high self-efficacy observed in Building an Innovative Environment reflected students' strong confidence in their ability to foster creativity and collaboration within teams, a crucial skill in technopreneurship. This confidence may stem from their exposure to collaborative design projects and problem-solving activities common in engineering and technology-related courses, especially among upper-year students. Such experiences help build mastery and leadership, boosting self-efficacy in creating an innovative climate (Bandura, 1997). This supports the finding of Wei, Chen, Zhang, and Zhang (2020) that entrepreneurial self-efficacy positively influences innovation behavior. Consequently,

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students likely view themselves as future innovation leaders, particularly in technology-driven ventures.

The lowest mean score among the six high-rated TSE dimensions was Developing Critical Human Resources, which involves skills like recruiting, training, and retaining talent. This indicates students felt less confident in managing human resource-related tasks compared to other technopreneurial activities, likely due to their limited exposure to formal HR training, especially in non-business programs like engineering. SCT asserts that self-efficacy is shaped through mastery experiences (Bandura, 1997); thus, limited experience in HR may explain the lower self-efficacy in this area. Similarly, Naktiyok, Nur Karabey, and Caglar Gulluce (2010) found that people-related tasks like initiating investor relations and developing critical human resources had less influence on entrepreneurial intention compared to more technical and creative domains. This implies that HR skills may develop more slowly for students new to entrepreneurship.

The other four areas of TSE, which include Defining Core Purpose, Developing New Product and Market Opportunities, Coping with Unexpected Challenges, and Initiating Investor Relationships also received high ratings, indicating strong TSE among students. This is promising, as high self-efficacy is often associated with greater entrepreneurial intention (Zhao, Seibert, & Hills, 2005). These findings suggest that students are well-prepared to explore technopreneurial paths. To strengthen this potential, universities may consider offering leadership and team management training. Such programs could improve confidence in managing people-related tasks and further support students' readiness to pursue tech-based ventures.

Table 2
Descriptive Statistics for Technopreneurship Intention (TI)

Dimension	Mean (M)	SD	Interpretation
1. Preference	3.534	0.822	High
2. Plan	3.464	0.826	High
3. Desire	3.520	0.831	High
4. Behavior Expectation	3.471	0.764	High
Overall Technopreneurship Intention	**3.497**	**0.725**	**High**

Table 2 revealed that non-business students at SUCs in the Caraga Region demonstrated a high level of TI, with an overall mean score of 3.497, indicating strong entrepreneurial inclination despite their non-business backgrounds. All four dimensions of TI scored above 3.40, with Preference (M = 3.534) rated highest and Plan (M = 3.464) lowest. This is an encouraging finding, as intention is considered a key step toward actual entrepreneurial action under the Theory of Planned Behavior (Ajzen, 1991). According to Ajzen (1991), strong intentions predict actual behavior. Therefore, these high levels of TI

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may lead to real entrepreneurial action if students are equipped with adequate resources and support (Astiana, Malinda, Nurbasari, & Margaretha, 2022).

The preference for a technopreneurial career was very strong among respondents. This implies that many students view technology-based business as their preferred career path. The high ratings in the Desire dimension further reflect a deep personal aspiration to become technopreneurs, suggesting that this motivation is not merely academic but personally meaningful. These findings support the TPB, which emphasizes that favorable attitudes and perceived desirability strengthen entrepreneurial intention (Ajzen, 1991; Astiana et al., 2022). Similar studies also show that non-business students develop strong entrepreneurial intentions when they view business as fulfilling and aligned with their interests, especially those with innovation-driven academic exposure (Barba-Sánchez & Atienza-Sahuquillo, 2018; Dao, Bui, Doan, Dao, Le, & Le, 2021). Thus, students' regular engagement with technology and innovation likely fosters their preference and desire to pursue technopreneurship.

The Plan and Behavioral Expectation dimensions of TI were rated high but slightly lower than other areas of TI, indicating that while students are inclined toward technopreneurship, they may not yet be ready to act immediately. This suggests students are still forming ideas or awaiting the right resources and opportunities, which is understandable given their academic commitments. Creating a concrete business plan requires time, confidence, and support, which may still be developing. These findings imply that while students are psychologically prepared, they need institutional guidance to transition from intention to action. Therefore, educators and policymakers must provide experiential learning, mentorship, and supportive environments to convert strong intentions into actual ventures, boosting innovation and economic growth in the region.

Table 3
Descriptive Statistics for Financial Literacy (FL)

Dimension	Mean (M)	SD	Interpretation
1. Financial Knowledge	3.779	0.636	High
2. Financial Attitude	3.716	0.643	High
3. Financial Behavior	3.741	0.654	High
Overall Financial Literacy	**3.745**	**0.549**	**High**

Table 3 exhibited that non-business students in SUCs in the Caraga Region demonstrated a high level of FL, with an overall mean of 3.745. All three FL dimensions: financial knowledge, financial attitude, and financial behavior were rated high. Financial knowledge (M = 3.779) scored the highest, while financial attitude ((M = 3.716) was the lowest, though the differences were minimal. These closely aligned scores indicate that students not only understand financial concepts but also maintain responsible attitudes

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and behaviors toward money. This reflects a well-rounded FL, where knowledge, mindset, and practice are consistently aligned.

A closer look at the results suggested that non-business students in the Caraga Region had a strong foundational understanding of key financial concepts, particularly in areas such as the time value of money and inflation. This suggests that most students understand that money today holds more value than in the future and are aware that rising prices can reduce purchasing power. These findings are notable given that the respondents were not from business-related programs, which implies that their financial knowledge may have been shaped by general education subjects, social media, news, and real-life experiences such as recent price increases.

Beyond financial knowledge, students exhibited disciplined financial behavior such as timely bill payments and thoughtful spending likely influenced by managing limited budgets, which supports long-term financial stability. This aligns with Kamel and Sahid (2021), who found that students with higher FL tend to save, plan, and spend cautiously. Additionally, students showed a positive financial attitude, feeling capable in managing personal finances and making informed decisions, possibly shaped by real-life budgeting or school-based financial literacy programs. As noted by Kamel and Sahid (2021), such attitudes are critical in shaping responsible financial behavior and reinforcing FL. Together, these findings highlight how students' sound attitudes and behaviors significantly contribute to their overall FL.

While students generally demonstrated strong FL, their familiarity with investment-related topics showed room for improvement, particularly in staying informed about the stock market. This aligns with national trends, as only about 1.27% of Filipinos participated in the stock market as of 2020 (Dumlao-Abadilla, 2021), a figure linked to limited understanding and disinterest among the youth (Musiał & Świecka, 2016). For Caraga students, limited investment engagement may stem from financial constraints, topic complexity, or lack of exposure in their coursework, especially since most rely on allowances and lack steady income. Despite this, their strong budgeting, saving, and spending habits indicate a solid grasp of fundamental financial skills. These findings highlight that while students excel in everyday money management, enhancing their knowledge of investment and advanced financial planning could further strengthen their financial preparedness.

Table 4
Pearson Correlation Coefficients Among the Study Variables

Variables		1	2	3
1. Technopreneurial Self-Efficacy		1		
2. Financial Literacy	Pearson Correlation	.627**	1	

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	Sig. (2-tailed)	.000		
	N	400		
3. Technopreneurship Intention	Pearson Correlation	.663**	.509**	1
	Sig. (2-tailed)	.000	.000	
	N	400	400	

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

Table 4 presented Pearson correlation coefficients between three variables: TSE, TI, and FL. The decision on the null hypothesis (Ho) was to reject in all cases, indicating significant correlations.

The Pearson correlation between TSE and TI was 0.663, indicating a strong, statistically significant positive relationship (p = 0), which supports rejecting the null hypothesis (Ho_1) that no correlation exists. This means non-business students who are more confident in their technopreneurial abilities are more likely to intend to start technology-based ventures. This finding aligns with previous studies showing that students with strong self-belief are more likely to pursue entrepreneurial careers (Al Issa et al., 2019; Otache, Edopkolor, & Okolie, 2021; Zhao et al., 2005). Higher TSE enhances confidence in managing startup challenges, thus strengthening entrepreneurial intentions (Çankır, 2017; Hoque et al., 2017; Soomro & Shah, 2021). Similar patterns have also been found among college social entrepreneurs, further confirming that entrepreneurial self-efficacy is positively linked to entrepreneurial intention (Chien-Chi, Sun, Yang, Zheng, & Li, 2020).

The Pearson correlation between FL and TSE was 0.627, indicating a strong, statistically significant positive relationship (p = 0), justifying the rejection of the null hypothesis (Ho_2) that no correlation exists. This means that students with higher FL tend to feel more confident in their ability to start and manage technology-based ventures. This finding is consistent with prior studies, which confirm that FL positively influences entrepreneurial self-efficacy (Sarsale, 2021; Tambunan, Hou, Nasib, & Pasaribu, 2024; Tekin & Asar, 2021). Tran, Phung, Nguyen, and Nguyen (2024) further support this by linking financial knowledge to enhanced perceived behavioral control, while Aprilia et al. (2024) emphasize that financial competence must be paired with self-confidence to lead to entrepreneurial action. Together, these findings underscore the critical role of FL in fostering the confidence needed to pursue and manage technology-based business ventures.

The Pearson correlation between FL and TI was 0.509, indicating a moderate, statistically significant positive relationship (p = 0), supporting the rejection of the null hypothesis (Ho_3) and confirming that students with higher FL are more likely to intend to pursue technopreneurship. This finding reinforces the idea that cognitive competencies such as FL, beyond psychological factors like self-efficacy, help shape entrepreneurial

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intentions. Studies have shown similar results, with FL significantly contributing to stronger entrepreneurial intentions (Aldi, Herdjiono, & Maulany, 2019; Kang, Park, & Jang, 2024; Tambunan et al., 2024; Tekin & Asar, 2021; Tran et al., 2024). However, Alshebami and Al Marri (2022) noted that in the Saudi context, FL alone was insufficient unless paired with saving behavior or financial support. Overall, the present study supports the growing body of evidence emphasizing FL as a critical factor in cultivating TI among students.

The results showed that all three core variables of the study were significantly and positively related to one another. The non-business students in the survey demonstrated high levels of TSE and FL, which seem to work together in shaping their strong intention to pursue technopreneurship. These direct relationships suggest that students who feel capable of handling entrepreneurial tasks and are financially literate are more likely to show serious interest in starting tech-based businesses. Strengthening any of these areas may positively influence the others, showing how important it is to design technopreneurship programs that build both the mindset and practical skills students need for successful ventures.

Table 5
Model Summary of the Predictors of Technopreneurship Intention

Model	R	R^2	Adjusted R^2	Std. Error of Estimate	ΔR^2	F Change	df1	df2	Sig. F Change
1	0.663a	0.440	0.438	0.54393	0.440	312.363	1	398	0.000
2	0.674b	0.454	0.451	0.53758	0.014	10.466	1	397	0.001

a. Predictors: (Constant), Technopreneurial Self-Efficacy
b. Predictors: (Constant), Technopreneurial Self-Efficacy, Financial Literacy

The hierarchical multiple regression analysis (Table 5) showed that in Model 1, TSE alone explained 44.0% of the variation in TI ($R^2 = 0.440$), indicating that students who are more confident in their technopreneurial abilities tend to have higher intentions to engage in technopreneurship. When FL was added in Model 2, the explained variance slightly increased to 45.4% ($R^2 = 0.454$), with the additional 1.4% contribution being statistically significant (F Change (1, 397) = 10.466, p = 0.001). These results suggest that both TSE and FL play important roles in influencing TI, with TSE having a stronger predictive power while FL still provides meaningful support in enhancing students' readiness to pursue technology-based business ventures.

It is important to note that while the original research design included the examination of FL as a moderating variable, this anticipated moderation effect was not statistically supported based on the analysis. Therefore, no interaction term was added, and the final regression models presented in this study reflect only the direct effects of

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TSE and FL on TI. This initial plan to explore moderation is still acknowledged as part of the study's objectives and is discussed as a limitation and recommendation for future research.

Table 6
Regression Coefficients[a]

Model	Predictors	B	Std. Error	β	t	Sig.	95% Confidence Interval for B	Collinearity (Tolerance, VIF)
1	(Constant)	0.482	0.173		2.791	.006	(0.143, 0.822)	
	Technopreneurial Self-Efficacy	0.853	0.048	0.663	17.674	.000	(0.758, 0.947)	(1.000, 1.000)
2	(Constant)	0.159	0.198		0.806	.421	(-0.229, 0.548)	
	Technopreneurial Self-Efficacy	0.728	0.061	0.566	11.897	.000	(0.608, 0.849)	(0.606, 1.649)
	Financial Literacy	0.204	0.063	0.154	3.235	.001	(0.080, 0.327)	(0.606, 1.649)

a. Dependent Variable: Technopreneurship Intention

Looking at the regression coefficients (Table 6), for Model 1, TSE was found to be a significant positive predictor of TI (B =.853, t = 17.674, p <.001). This result suggests that each one-unit increase in TSE is associated with an increase of 0.853 units in TI. When FL was added in Model 2, TSE remained a strong and significant predictor, though with a slightly reduced coefficient (B = 0.728, t = 11.897, p < .001). At the same time, FL also showed a significant contribution to predicting TI (B = 0.204, t = 3.235, p = .001), indicating that students with higher FL tend to have stronger TI, even when accounting for TSE. In terms of standardized coefficients, TSE had a Beta value of 0.566, while FL had a Beta of 0.154. This comparison shows that although both variables are significant predictors, TSE has a stronger effect on TI than FL. These findings confirm that while FL enhances the model, TSE remains the primary driver of students' intention to pursue technopreneurial activities.

These findings highlight the critical role of self-efficacy in shaping students' TI, aligning with numerous studies that found a significant positive relationship between self-efficacy and entrepreneurial intention, indicating that those confident in handling entrepreneurial tasks are more likely to pursue and succeed in business ventures (Al Issa et al., 2019; Çankır, 2017; Chien-Chi et al., 2020; Hoque et al., 2017; Otache et al., 2021; Soomro & Shah, 2021; Tambunan et al., 2024; Tekin & Asar, 2021; Tran et al., 2024; Zhao et al., 2005). Consistent with this literature, the current study confirms that TSE remains the strongest predictor of TI, even when FL is included in the model. Notably, this research

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expands the understanding of TSE's influence by focusing on non-business students in the Caraga Region, highlighting that TSE is a universally important factor in fostering entrepreneurial intentions, not limited to business majors.

In addition, the significant contribution of FL to TI observed in this study also finds support from previous research showing that FL positively influences entrepreneurial intention by enhancing students' financial decision-making and business readiness (Aldi et al., 2019; Kang et al., 2023; Tambunan et al., 2024; Tekin & Asar, 2021; Tran et al., 2024). While TSE remains the stronger predictor, FL independently supports students' readiness to pursue technology-based ventures. The absence of a significant interaction between FL and TSE suggests that FL does not moderate the effect of TSE on TI. High-efficacy students tend to show strong intentions regardless of their financial literacy, and low-efficacy students show weak intentions even if financially literate. Thus, FL acts as an additional supportive factor that enhances TI across the student population rather than acting as a condition that changes the relationship between TSE and TI.

CONCLUSION AND RECOMMENDATIONS

This study examined the TSE, TI, and FL of non-business students in SUCs within the Caraga Region to better understand their readiness to become competitive technopreneurs. Students reported consistently high levels of TSE across all dimensions, particularly in building an innovative environment, though they were less confident in developing critical human resources. TI was also high overall, with many strongly favored technopreneurship as their ideal career path; however fewer had laying out concrete plans or taking immediate steps toward starting a business. FL levels were likewise high in all three dimensions, but students indicated somewhat lower familiarity and engagement with investment topics, suggesting an area for further education.

Inferential results revealed significant positive correlations among all three variables. TSE strongly correlated with TI, while FL showed strong correlation with TSE and moderate with TI. Hierarchical multiple regression confirmed TSE as the strongest predictor of TI, with FL making a smaller but significant independent contribution. Importantly, the analysis revealed that the anticipated moderating role of FL on the relationship between TSE and TI was not statistically supported. Thus, FL emerged only as an additional direct predictor rather than a moderator.

These results support the TPB, which emphasizes perceived behavioral control, akin to self-efficacy, as a key predictor of intention and behavior (Ajzen 1991). The strong correlation and regression findings of TSE on TI affirms this theory. The findings also align with Bandura's SCT, reinforcing that belief in one's abilities (self-efficacy) influences

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behavior. Students with higher TSE and FL felt more capable of pursuing technopreneurship, thereby supporting the SCT framework.

Although non-business students in the Caraga Region are mentally prepared and financially aware, targeted improvements are needed to fully equip them as competitive technopreneurs. SUCs should prioritize experiential, well-structured activities within the one-semester Technopreneurship course to strengthen students' TSE, TI, and FL. To strengthen TSE, particularly in developing critical human resources, short modules on team leadership, mentoring, and conflict resolution can be embedded in the curriculum, with industry practitioners sharing real-world insights, supporting SDG 4 and SDG 8. Project-based learning like design-thinking workshops and product pitching competitions may also boost confidence in developing new product and market opportunities supporting SDG 9. For initiating investor relationships, exposure to pitching sessions in partnerships with local business groups or DTI is recommended promoting SDG 17.

To support the development of stronger TI, SUCs can incorporate practical planning tools, such as requiring a Personal Startup Action Map toward the end of the semester to guide students' post-course plans promoting SDG 8. Internally, establishing mentorship and incubation programs with regular progress check-ins, business planning support, and funding exposure will help transition ideas into ventures supporting SDG 9 and SDG 4. Externally, government agencies are encouraged to work with SUCs in promoting technopreneurship through regional summits, boot camps, and startup grants, advancing SDG 17. DTI can provide mentorship, market access, and startup programs such as KMME and YEP. DOST-PCIEERD can fund prototypes, support tech transfer, and promote science-based ventures. DICT may offer digital modules and startup toolkits to align with ICT goals. Moreover, CHED can ensure curriculum relevance and incentivize SUCs to participate in inter-agency collaborations.

To improve FL, especially in investment awareness, budgeting, and basic numeracy, SUCs may integrate short, applied financial modules into the Technopreneurship course. This could include guest talks on basic investment options like mutual funds and stocks, and on personal budgeting and financial planning, promoting SDG 4, along with practical exercises on startup costing, break-even analysis, and cash flow estimation to improve students' confidence in financial decision-making and numerical computation, aligning with SDG 8. Additionally, LGUs and youth organizations can assist by hosting financial wellness campaigns that address basic budgeting and funding assistance, especially for students with limited financial resources, advancing SDG 1 by building financial resilience and SDG 17.

While these initiatives can improve students' current readiness, further research is necessary to assess their long-term effectiveness and address remaining gaps. First, the non-significant moderating role of FL on the relationship between TSE and TI suggests a

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need for future studies using broader samples or advanced techniques like SEM. Second, as this study used self-reported data, incorporating objective assessments or qualitative methods could help validate findings. Third, since the sample was limited to non-business students from SUCs in the Caraga Region, expanding the scope to other regions or institutions may enhance generalizability. Fourth, longitudinal studies are recommended to monitor the development of TSE, TI, and FL over time. Lastly, qualitative research should explore the reasons behind lower scores in areas such as human resource management and investment knowledge to inform more targeted interventions. These efforts are crucial to developing competitive technopreneurs who can drive innovation, job creation, and sustainable growth in the Caraga Region and beyond.

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