Does Student's Education Background Affect Technopreneurship Intention? Insights from College Students in Bandung

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ARTICLE INFO

Article history:
Received
May 2025

Accepted
July 2025

Keywords
Technopreneurship Intention, Technopreneurship Attitude, Academic Support, Social Support, Major Background.

A B S T R A C T

The study aims at investigating factors affecting college students for entering technopreneurship, and whether their intentions are affected by their education backgrounds. The variables being used in the study are Social Support, Academic Support, Attitude toward Technopreneurship, Technopreneurship Intention, and Education background as moderating variable between Attitude toward Technopreneurship and Technopreneurship Intention. The research method is a quantitative study using PLS-SEManalysis. There are 333 respondents data were collected from students of various universities in Bandung and are valid for being used in the study. The result shows that Social Support and Academic Support are significantly affecting students' Attitude toward becoming technopreneurs, while the attitude toward technopreneurship significantly affects Technopreneurship Intention. However, the effect of Social Support on Attitude is stronger than Academic Support. The Social Support is the degree of family influence on the students (such as having family background which have strong entrepreneurship values and practices). It is surprising that Academic Support, the degree of influence of the academic institutions toward technopreneurship mindset of the students, have a rather weak effect on the students. This finding is quite a reflection of the technopreneurship education so far in the higher education. Another interesting finding is that the education backgrounds (major) of the students do not significantly moderate the relationship between Attitude toward Technopreneurship and Technopreneurship Intention. That means the intention to become technopreneur is not dominated by students who have an IT-based education. This result is contrary to the assumption that students with IT background are more likely to develop ventures for IT startup company. That is in line with our expectation that a technopreneur can emerge from any major background.

1. Introduction

The integration of nature and nurture is vital in the development of a technopreneurial mindsetamong college students. This synthesis of inherent traits and external influences significantly contributes to cultivating an entrepreneurial spirit, particularly within educational settings thatemphasize technopreneurship. Education systems that implement a curriculum designed to foster both technological competence and entrepreneurial skills are

crucial in shaping the entrepreneurial landscape. The role of educational institutions as facilitators of this dualapproach is significant, as they not only equip students with essential knowledge but also instilla growth mindset that is instrumental in fostering resilience and adaptability in a rapidly evolving technological environment.

Research indicates that the interplay between a student's inherent abilities (nature) and the learning environment (nurture) significantly influences their academic achievement and entrepreneurial intentions. For example, a growth mindset—believing that abilities can be developed—has been shown to mediate the relationship between supportive educational environments and student success [1], [2]. Educational curriculums that prioritize experiential learning, such as hands-on experiences and project-based learning, help students navigate complex real-world challenges and become more innovative thinkers [3], [4]. These approachesnot only enhance academic alertness but also nurture an entrepreneurial mindset that is essentialfor technopreneurship [5].

1.1 Background

In recent years, the concept of technopreneurship has gained substantial attention as a pivotal driver of innovation and economic growth. Technopreneurship, which merges technological skills with entrepreneurial capability, has become crucial for fostering sustainable business practices in the contemporary global economy. Educational institutions play a fundamental rolein shaping technopreneurial intentions among students, equipping them with the necessary skillsand mindsets to navigate an increasingly complex marketplace. A structural model focusing ontechnopreneurial intention, with social support and academic support as key exogenous variables, can provide valuable insights into how various influences shape students' intentions to pursue technopreneurship.

Social support encompasses the various forms of assistance received from peers, family, and mentors, which can influence students' confidence and readiness to engage in technopreneurial ventures. However, research has indicated mixed results regarding the impact of social networksupport on entrepreneurial intentions, with some studies suggesting no significant link betweensocial support and technopreneurial intentions [6]. This highlights the complexity of factors thatcan influence students' entrepreneurial aspirations, suggesting that social support alone may notadequately drive technopreneurial intentions [6]. On the other hand, academic support—referring to resources and encouragement provided by educational institutions—has been more consistently identified as a predictor of entrepreneurial intentions. Academic support includes mentorship, exposure to entrepreneurship-focused curricula, and access to experiential learning opportunities that enhance students' skills and confidence [7]. Studies have demonstrated a positive correlation between academic self-efficacy and technopreneurial intentions, emphasizing the importance of an educational framework that encourages innovation and entrepreneurship [5,7]. Hence, creating an educational environment that fosters academic and social support will likely lead to higher rates of technopreneurial intention among students.

The background of a student's major can significantly influence their decision to become a technopreneur. For instance, students in technical and engineering disciplines often have moreexposure to the practical application of technology, which can enhance their confidence and ability to innovate within the technopreneurship space. On a study of technopreneurship readiness, [8] assert that technological competence, creativity, and innovation are essential

traitsfor technopreneurs, suggesting that disciplines emphasizing these skills can provide a strong foundation for entrepreneurial intentions. Students from such backgrounds may feel more equipped to identify market needs and develop innovative solutions, directly impacting their technopreneurial aspirations. Moreover, the intersection of their major with entrepreneurial education can further cultivate a mindset conducive to technopreneurship, amplifying their readiness to venture into technology-driven entrepreneurial endeavors, as evidenced by [9].

Conversely, students from non-technical backgrounds might face more challenges in transitioning to technopreneurship. According to [10], personal attitudes towards technology significantly affect students' engagement in technopreneurship, and these attitudes may be influenced by prior educational experiences and the relevancy of their major to technological innovation. For example, students majoring in humanities may not have direct access to technology-focused curricula, which could hinder their capacity to engage with technopreneurship effectively. Furthermore, even within technical fields, differences in how students perceive their abilities to apply their knowledge in entrepreneurial contexts can affect their intentions to pursue technopreneurship, which aligns with findings from [11]. Thishighlights the importance of fostering a supportive environment that encourages all students—regardless of their major—to explore entrepreneurial avenues and develop the necessary skills to succeed in technopreneurship.

1.2 Problem Statement

This research aims at investigating factors affecting college students for entering technopreneurship, and whether their intentions are affected by the support of their family, academic environment, and their education backgrounds.

1.3 Objectives and Scope

The primary objectives of this research are as follows, first, to identify key factors influencing technopreneurship intentions. Second, to assess the impact of educational backgrounds on the technopreneurship intention. The research will investigate the extent to which students' educational backgrounds—IT and non-IT—affect their propensity to enter into technopreneurship [12]. This includes examining how different disciplines provide students with unique skill sets and knowledge bases that may encourage or discourage entrepreneurial pursuits. Third, to evaluate the role of entrepreneurial education. The influence of entrepreneurship education on students' intentions will be assessed, specifically how it shapes their perceptions of feasibility, desirability, and overall entrepreneurial mindset [13,14]. The study will look into the educational interventions that best foster technopreneurial intentions among students. Fourth, to provide recommendations for policy and practice**,** especially for educational institutions and policymakers that could improve the support and resources available to students, thereby enhancing their technopreneurial intentions and skills.

This research will focus on college students in higher education institutions in Bandung, Indonesia. The study will target undergraduate students from diverse majors, including but notlimited to business, engineering, information technology, and social sciences, and will be divided into two groups of majors that are IT and non-IT. A quantitative approach involving quantitative surveys will be employed to gather data.

2. Literature Review

Research investigating the factors that affect college students' intentions to pursue technopreneurship is essential for several reasons. The intersection of technology and entrepreneurship—an area defined as technopreneurship—holds significant potential for economic growth and innovation in various sectors. Understanding what drives students from diverse educational backgrounds to consider technopreneurship can help institutions tailor theirprograms to better prepare students for these career paths. Prior research has shown that college education, particularly in fields related to technology and business, significantly influences students' entrepreneurial intentions by enhancing their self-efficacy and perceived behavioral control regarding their entrepreneurial capabilities [15]. By investigating the specific educational experiences that contribute to these intentions, researchers can better identify the necessary components of an effective technopreneurship curriculum.

Moreover, students' backgrounds and fields of study can affect their readiness and motivationto engage in technopreneurial activities. For instance, students with a technical or engineering focus may have more exposure to the practical applications of technology and, therefore, mightdevelop greater confidence in launching technology-based ventures [16]. In contrast, students from non-technical disciplines may face barriers due to limited access to relevant knowledge and experience, which could hinder their ability to engage with technopreneurship effectively. In a study about entrepreneurial attitude, [17] emphasized that education focused on creating anentrepreneurial attitude and innovative thinking is vital for fostering technopreneurship among all students, regardless of their major. Thus, understanding the discrepancies based on educational backgrounds can guide policymakers and educators in creating inclusive and supportive environments that nurture technopreneurial ambitions for all students, ultimately contributing to reducing skills gaps in the labor market and supporting sustainable economic development.

2.1 Related Work

Numerous studies indicate that education plays a pivotal role in shaping students' entrepreneurial intentions. According to [18], entrepreneurship education is positively correlated with entrepreneurial intentions, particularly among male students, underscoring the need for gender-sensitive approaches in educational programs. The findings suggest that exposure to entrepreneurial concepts increases students' motivation to pursue entrepreneurial careers. Similarly, [19] emphasizes the necessity of tailored entrepreneurship education that aligns with students' personal and professional attributes to enhance their willingness and readiness to engage in entrepreneurship, particularly in partnership forms within diverse teams.

In addition to educational factors, personal traits significantly impact technopreneurship intentions. Nunfam et al. [20] highlight the connection between personality traits and entrepreneurial intention, emphasizing that students with a proactive attitude and strong self-efficacy are more likely to pursue technopreneurial ventures. Additionally, [21] find that entrepreneurial self-efficacy mediates the relationship between entrepreneurship education andstudents' innovative capacity, further demonstrating the interplay between education and individual attributes. These studies collectively emphasize the diverse influences—ranging

from personal characteristics to educational frameworks—that shape students' intentions towardtechnopreneurship.

The study of [22] identify challenges related to the availability of resources, such as funding and mentorship, which are critical for launching entrepreneurial ventures. Additionally, accessto practical opportunities, such as internships and project-based learning experiences, is necessary for instilling confidence and practical skills in aspiring technopreneurs. Moreover, Shah et al. (2020) also point to the inconsistencies in empirical findings regarding entrepreneurial intention due to varying methodologies and contextual factors, suggesting that a standardized approach to measuring entrepreneurial intention is needed. The complexities of these challenges highlight the necessity for ongoing research into the barriers students face andthe development of comprehensive strategies to support their ambitions in technopreneurship.

2.2 Research Gap

The body of literature demonstrates that technopreneurship intentions among college studentsare influenced by a combination of educational frameworks, personal attributes, and institutional support mechanisms. Entrepreneurship education is pivotal in shaping these intentions, yet significant barriers still hinder many students from realizing their potential as technopreneurs. Therefore, this study offers another approach on understanding how students' technopreneurial intention is created involving the variables Social Support, Academics Support, Attitude, and major as moderating variable between Attitude and Technopreneurial Intention.

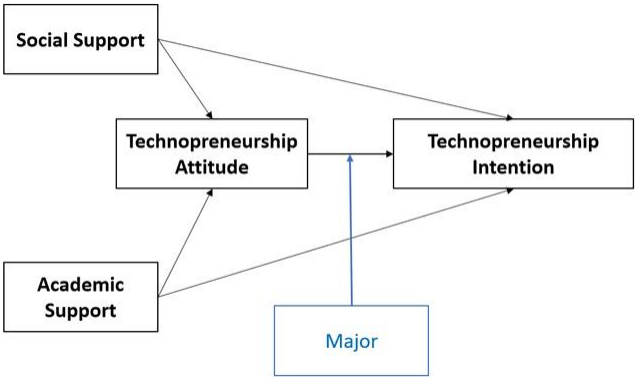

Figure 1. Technopreneurship intention model with major as moderating variable

Social support plays a significant role in shaping entrepreneurial/technopreneurial intentions by providing emotional encouragement, informational guidance, and tangible resources that influence an individual's decision to start a business. In the context of entrepreneurship, social support typically stems from family, friends, mentors, peers, and professional networks. Thesesupport systems help reduce perceived risks and increase self-confidence, which are key psychological factors influencing entrepreneurial behavior. Social support stems from Ajzen's [23] Theory of Planned Behavior which is subjective norms—or the perceived expectations of significant others—directly impact one's intention to engage in a specific behavior, such as starting a business. Social support reinforces these norms by offering validation and practical backing. Empirical studies have confirmed that

individuals who receive strong social encouragement are more likely to develop positive attitudes toward entrepreneurship and exhibit stronger entrepreneurial intentions [24].

Family support, in particular, has been found to be one of the most consistent predictors of entrepreneurial intention. This includes not only financial assistance but also moral support andencouragement to take entrepreneurial risks [25]. Meanwhile, support from peers and mentors provides access to knowledge, experience, and networks that can lower entry barriers to entrepreneurship [26]. In collectivist cultures such as Indonesia, where community and familialbonds are especially influential, social support can significantly amplify the likelihood of pursuing entrepreneurial activities [27].

Various studies found that support systems within institutions enable students to explore technopreneurship. A study of [28] presents evidence that institutional support, such as mentorship programs and incubators, positively affects students' entrepreneurial intentions by cultivating an entrepreneurial attitude and confidence in their abilities. On another study, [29] argue that integrating innovative technologies into entrepreneurial curricula significantly enhances students' entrepreneurial skills and intentions. They advocate for the combination of digital tools with social management education, suggesting that a digital approach can lower barriers to entry in entrepreneurship. Furthermore, [30] assert that supportive educational environments—characterized by active pedagogical strategies and encouragement of innovative practices—significantly correlate with students' entrepreneurial intentions, fostering a sustainable entrepreneurial mindset.

Attitude plays a central role in shaping both entrepreneurial and technopreneurial intentions. Within the framework of [23] the Theory of Planned Behavior (TPB), attitude toward behavior refers to the degree to which a person has a favorable or unfavorable evaluation of becoming an entrepreneur. A positive attitude increases the likelihood of forming a strong intention to engagein entrepreneurial activities, especially those related to technology and innovation. In the context of technopreneurship, attitude influences how students perceive the value, risks, and personal satisfaction associated with launching a tech-based venture. When individuals believe that being a technopreneur leads to positive outcomes—such as financial independence, problem-solving opportunities, or societal impact—they are more likely to develop a strong entrepreneurial intention [24]. This is particularly relevant in technology-driven environments,where innovation is often seen as both challenging and rewarding.

Empirical evidence supports the relationship between attitude and technopreneurship intention. For instance, [31] demonstrated that attitude was one of the strongest predictors of entrepreneurial intention among university students in both developed and developing countries. Attitude is shaped by prior exposure to entrepreneurship, cultural values, and individual experiences. When institutions provide positive reinforcement—through successful role models, startup success stories, or tech-based business competitions—it can enhance students' perception of entrepreneurship as a desirable and achievable career path [32]. Moreover, in technopreneurship specifically, the perception of self-efficacy in handling digitaltools, managing online platforms, or applying emerging technologies (like AI or IoT) can also reinforce a positive attitude toward the entrepreneurial process, thereby increasing intention [33].

3. Methodology

The research employs a quantitative method that follows major previous researches regardingtechnopreneurship intention. This path is taken in order to get connected to the prior knowledgeabout technopreneurship that are have already known and accumulated so far.

3.1 Data Collection

Data were collected from college students of various universities in Bandung, Indonesia. Thedata collection technique was using random sampling and the questionnaire we distributed usingonline form. Even though there are 392 data submissions, however, only 333 are deemed to bevalid for data analysis.

3.2 Analysis Techniques

PLS-SEM will be used as data analysis technique to test whether the model depicted in Figure1 is a good model for the data. Hair et al. [34] stated that PLS-SEM is the appropriate analysis method if the goal of the research is to find the important factors or the drivers of the construct. Further they assert that PLS-SEM is suitable for exploratory research. SmartPlS® will be usedfor data analysis tool.

3.3 Validation

The validity test for the questionnaire instrument is using Pearson Product-Moment correlation coefficient with the threshold of r > 0.254 [35]. Basically, Pearson's correlations show the strength of the correlations among items of a latent variable. If the result is significantfor certain item, it means that the item belongs to the latent variable being tested. Cronbach's alpha is used for measuring the reliability of the measurement items with the threshold value ofalpha => 0.7 [36].

4. Results and Discussion

Validity test gives the result of significant for all measurement items (r > 0.254, alpha < 0.05). Thereliability test also returns significant with Cronbach's alpha > 0.7 for all latent variables. The similar result of validity and reliability report can also be found in the PLS-SEM analysis report from SmartPLS. Henseler et al [37] stated that discriminant validity can be established based on HTMT's score below 0.9. Further evidence for validity can be secured by the bootstrapped confidence intervals for HTMT that do not include the value 1.00 (gray area) as shown on Table 1.

Table 1. The bootstrapped confidence intervals for HTMT

	Academic Support	Major	Moderating Effect	Social Support	Technopreneurship Attitude	Technopreneurship Intention
Academic Support						
Major	0.144					
Moderating Effect	0.120	0.052				
Social Support	0.638	0.161	0.129			

Technopreneurshi pAttitude	0.546	0.106	0.149	0.725		
Technopreneurshi pIntention	0.574	0.051	0.124	0.779	0.757	

Hair et al. [34] provide guidance on what should be reported for the PLS-SEM analysis. The firstis internal consistency reliability which can be found in the composite reliability report as shown in Table 2. Composite reliability and rho-A should be above 0.7 for good internal consistency, while AVE score > 0.5 shows a convergent validity. Therefore, it can be concluded that the requirement for composite reliability is fulfilled.

Table 2. Composite Reliability and rho_A

	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Academic Support	0.833	0.868	0.552
Major	1.000	1.000	1.000
Moderating Effect	1.000	0.755	0.328
Social Support	0.769	0.818	0.533
Technopreneurship Attitude	0.845	0.868	0.556
Technopreneurship Intention	0.858	0.886	0.530

The second component that should be reported is indicator reliability or indicator loadings. In PLS-SEM, indicator loadings above 0.70 are preferred, but values as low as 0.50 are considered acceptable, especially in exploratory models or when composite reliability exceed the threshold ([38], [39], [40]). Figure 2 shows the result of PLS algorithm process. It can be seen that the scores of indicator loadings are between 0.5 - 0.8 and considered acceptable. The third aspect that should be reported is convergent validity that found on the score of Average Variance Extracted (AVE). The score of AVE should exceed 0.5 to confirm the validity. The AVE score is shown in Table 2, and all of the AVE scores are above 0.5, except for moderating effect which is insignificant.

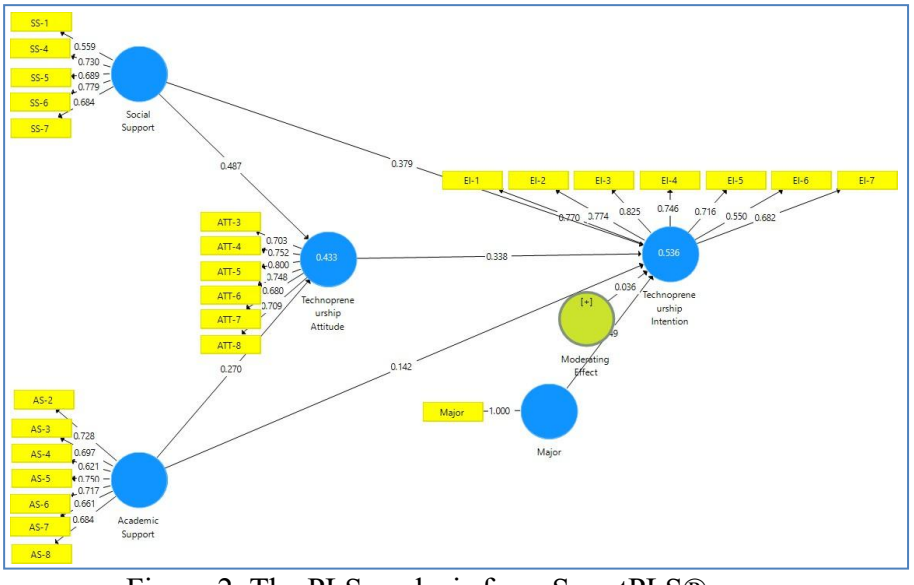

Figure 2. The PLS analysis from SmartPLS®

The fourth factor that is to be checked is Fornell-Larcker Criterion for discriminant validity. Discriminant validity is established if the square root of the AVE (diagonal values) for each construct is greater than all of its correlations with other constructs (off-diagonal values). Asshown in Table 3, discriminant validity is confirmed for all constructs using the Fornell-Larcker criterion where each diagonal value (square root of AVE) is higher than its respective horizontal and vertical correlations with other constructs.

Table 3. The Fornell-Larcker Criterion

	Academic Support	Entrepreneurship Attitude	Entrepreneurship Intention	Major	Moderating Effect	Social Support
Academic Support	0.695					
Entrepreneurship Attitude	-0.126	1.000				
Entrepreneurship Intention	0.044	0.049	0.703			
Major	0.467	-0.062	0.086	0.692		
Moderating Effect	0.497	-0.094	0.121	0.613	0.733	
Social Support	0.483	-0.022	0.117	0.653	0.641	0.728

For structural model assessment, the result of R^2 for dependen variables can be seen in Figure 2. The score of R^2 for Technopreneur Attitude is 0.433 which is considered medium to low, while the R^2 for Technopreneurship Intention is 0.536 that is considered medium. Figure 3 shows the result of bootstrapping process.

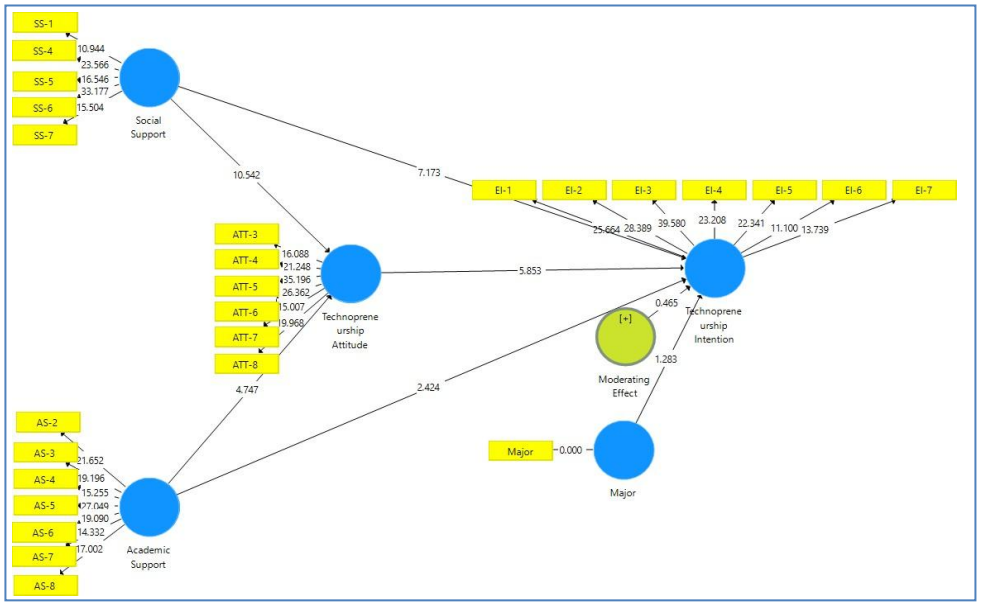

Figure 3. The result of bootstrapping process from SmartPLS®

There are two major outcomes from the bootstrapping process. First, all paths' coefficient, exceptfor moderating variable, are significant which are above the critical point of 1.96.

Second, the moderating effect of Major toward the relationship between Technopreneurship Attitude and Technopreneurship Intention is not significant.

4.1 Key Findings

There several key findings of the research. First, Technopreneurship Attitude is affected by SocialSupport and Academic Support. However, Social Support has the strongest impact on Technopreneurship Attitude. Second, Social Support, Academic Support, and Technopreneurship Attitude have medium impact on Technopreneurship Intention. The strongest impact comes from Social Support. Third, Major of the students does not moderate the relationship between Technopreneurship Attitude and Technopreneurship Intention.

4.2 Interpretation of Results

The most significant outcome from the findings is the consistent and strong influence of social support—both on technopreneurship attitude and technopreneurship intention. This highlights the critical role of students' surrounding environment, particularly their families, peers, and social networks. It suggests that encouragement, emotional reinforcement, and perhaps even peer modelingplay a larger role than formal education in motivating students toward technology-based entrepreneurial paths. These findings echo previous research indicating that social support can shapeentrepreneurial attitudes by increasing confidence, reducing perceived risk, and reinforcing behavioral norms [24], [27]. On the other hand, while academic support—through exposure to entrepreneurship education, mentorship, and institutional encouragement—does have a meaningful effect on both attitude and intention, its influence is weaker compared to social support. This suggeststhat academic programs alone may not be sufficient to trigger strong entrepreneurial intentions unlesscomplemented by external, interpersonal factors. Universities may need to integrate peer learning, community involvement, and industry collaboration to amplify the effect of academic support on entrepreneurial behavior.

Based on the finding of this research, contrary to expectations, the students' major (the field of study)turns outdoes not moderate the link between attitude and intention. This suggests that regardless of whether students come from technical or non-technical backgrounds, their attitude toward technopreneurshipremains an equally strong predictor of their intention. In other words, a student from a business or social science major is just as likely to develop technopreneurial aspirations as an engineering student—provided they receive adequate support and develop a positive attitude.

5. Discussion

The findings of this study offer meaningful insights into the formation of technopreneurship intention among college students and align with previous empirical research in the field. First, the result that Technopreneurship Attitude is influenced by Social Support and Academic Support, with Social Support being the most influential, resonates with prior studies emphasizing the role of socialcontext. According to [24], social support enhances entrepreneurial self-efficacy and positive attitudes by shaping norms and perceived behavioral control. Similarly, [27] found that familial and peer support significantly contributes to the development of a favorable entrepreneurial mindset, especially in

collectivist cultures where social bonds are influential.

Second, the finding that Social Support, Academic Support, and Technopreneurship Attitude each have a moderate influence on Technopreneurship Intention, with Social Support being the strongest predictor, supports Theory of Planned Behavior [23]. This theory suggests that attitudes, subjective norms (which include social pressure and support), and perceived control are key predictors of intention. Social support often acts as a proxy for subjective norms and has been found to reduce perceived risks while increasing motivation.

Implications for practice in the effort on creating technopreneurship intention among college students are, first, universities should strengthen mentorship and peer-based initiatives to enhance social support networks. This program is envisioned to fill the gap that might exist for certain studentswho do not have entrepreneurial experience or support of family or friends from outside the academic setting. Second, cross-disciplinary programs should be promoted, as technopreneurial interest is not limited to specific majors. Third, entrepreneurship curricula should focus not just on skills, but also on shaping attitudes and increasing exposure to positive social influences.

5.1 Comparison with Prior Research

The result that student major does not moderate the relationship between Technopreneurship Attitude and Technopreneurship Intention contradicts some previous studies which suggested thatSTEM or business-related majors may be more inclined toward technopreneurship [33]. However,this outcome also aligns with research by Mwiya et al [31], who found that once students developa strong attitude toward entrepreneurship, external variables such as field of study may have limited influence on their intention, suggesting that attitudinal factors can override disciplinary boundaries.

5.2 Limitations

There are some limitations regarding this study. First, the research model is limited on four variables that could not capture the deeper understanding on technopreneurship intention. Second,the number of sample size should be higher to represent the whole student population. Third, the sampling method are not capable of taking the sampel from population fairly among all majors.

5.3 Future Research

There are several future research that can be proposed. First, exploring the role of digital supportsystems in technopreneurship intention. While social support has been identified as a significant factor influencing technopreneurial intention, future research could delve deeper into the role of digital platforms and online mentorship in shaping students' attitudes and intentions. With the growing reliance on digital technologies and social media for entrepreneurship, understanding how digital networks (e.g., online communities, virtual mentorship, and e-entrepreneurship platforms) impact students' entrepreneurial mindset would be beneficial. Second, the longitudinal analysis of technopreneurial intention development. Most studies on technopreneurship intention, including this study, are cross-sectional. A longitudinal design would help track how attitudes and intentionsevolve over

time. Third, the research regarding the influence of family and peer social support in rural vs. urban contexts. Given that social support was identified as a critical factor in shaping technopreneurial attitudes, it would be worthwhile to explore whether the type of social support (family, peers, mentors) differs based on geographic location (urban vs. rural). The role of familysupport, which has been a dominant factor in rural contexts, versus peer and institutional support in urban settings, could have varying impacts on students' entrepreneurial intentions.

6. Conclusion

Based on the findings, this study confirms that social support plays a central role in shaping both students' attitudes toward technopreneurship and their intention to pursue it. While academic support contributes meaningfully, its influence is comparatively less powerful unless complemented by peer interactions, mentorship, and a socially encouraging environment. The consistent effect of social support underscores the importance of community, familial encouragement, and peer networks in fostering entrepreneurial mindsets. Additionally, technopreneurship attitude serves as a bridge between support systems and intention, aligning wellwith the Theory of Planned Behavior, which emphasizes the role of attitudes and subjective normsin predicting intentional behavior.

Furthermore, the research found that students' academic majors do not moderate the relationship between attitude and intention. This is a significant observation, as it challenges the assumption that students from technical or business-related fields are more inclined toward technopreneurship.Instead, the results suggest that students across various disciplines can possess similar levels of entrepreneurial intention, provided they hold a strong positive attitude and receive sufficient support. This opens the door for cross-disciplinary interventions, implying that technopreneurshipeducation and support programs should be inclusive of all study backgrounds to effectively cultivate future digital entrepreneurs.

7. Recommendations

There are some recommendations based on the findings and discussions. First, universities must place greater emphasis on building and sustaining strong social support systems to foster technopreneurial intention among students. Institutions should go beyond traditional academic offerings by integrating mentorship programs, peer collaboration platforms, and engagement withentrepreneurial role models, particularly through alumni networks and startup communities. Second, social encouragement and interpersonal validation—especially from peers and family— can significantly boost students' attitudes toward technopreneurship. To maximize this effect, universities can organize cross-faculty hackathons, collaborative workshops, and student-run business incubators that emphasize both social interaction and technological creativity. Third, academic programs should be designed to reach students across all majors, not just those in technical or business fields. The finding that students' field of study does not moderate the relationship between attitude and technopreneurship intention indicates that technopreneurial potential exists broadly and should be cultivated regardless of academic background. Fourth, universities should implement inclusive entrepreneurship education accessible to all departments,with learning goals aimed at shaping attitudes, reducing perceived risks, and reinforcing the valueof digital innovation. By combining academic support with targeted social reinforcement, institutions can better equip students with the mindset and motivation needed to pursue technopreneurial

careers.

Acknowledgement

The authors would like to acknowledge the financial support from The Office of Research and Community Service (LPPM), Universitas Muhammadiyah Bandung.

REFERENCES

[1] Zhang K and He W-J 2025 Teachers' Growth Mindset, Perceived School Climate, and PerceivedParental Autonomy Support Moderate the Relationship Between Students' Growth Mindset and Academic Achievement *J. Intell.* 13 8

[2] Saadat S, Aliakbari A, Alizadeh Majd A and Bell R 2022 The effect of entrepreneurship education on graduate students' entrepreneurial alertness and the mediating role of entrepreneurial mindset *Educ. + Train.* 64 892–909

[3] Nanda Nur Rafiana 2023 Technopreneurship Strategy to Grow Entrepreneurship Career Options forStudents in Higher Education *ADI J. Recent Innov.* 5 110–26

[4] Ayeni D O and Killian O T P 2023 Technopreneurship Education, Occupational Counselling, and Sustainable Development in Nigeria *Br. J. Multidiscip. Adv. Stud.* 4 34–43

[5] Ramlee N A Z, Rahim H L and Ahmad N N 2024 Developing a Framework for Technopreneurial Behavior: The Mediating Role of Technopreneurial Intention and Moderating Role of Attitudes *Inf. Manag. Bus. Rev.* 16 475–81

[6] Yordanova D, Filipe J A and Pacheco Coelho M 2020 Technopreneurial Intentions among BulgarianSTEM Students: The Role of University *Sustainability* 12 6455

[7] Salhieh S M and Al-Abdallat Y 2021 Technopreneurial Intentions: The Effect of Innate Innovativeness and Academic Self-Efficacy *Sustainability* 14 238

[8] Kertiasih N K, Kustono D, Purnomo and Sutiaji E 2024 Analysis on clout of Tri Hita Karana, technological competence, and entrepreneurship drive toward technopreneurship readiness on vocational high school students *Multidiscip. Sci. J.* 6 2024167

[9] Kim M and Park M J 2019 Entrepreneurial education program motivations in shaping engineeringstudents' entrepreneurial intention *J. Entrep. Emerg. Econ.* 11 328–50

[10] Oladejo M A, Adebayo A and Thomas O A 2022 Predictors of Technopreneurship Engagement Among Nigerian Undergraduates in an Emerging Society 5.0: Policy Imperatives *J. Pendidik. Nonform.* 17 1

[11] Zhang J and Huang J 2021 Entrepreneurial Self-Efficacy Mediates the Impact of the Post-pandemic Entrepreneurship Environment on College Students' Entrepreneurial Intention *Front. Psychol.* 12

[12] Vuorio A M, Puumalainen K and Fellnhofer K 2018 Drivers of entrepreneurial intentions insustainable entrepreneurship *Int. J. Entrep. Behav. Res.* 24 359–81

[13] Putri R H 2022 Analysis of the Effect of Entrepreneurship Education, Family Environment, andEntrepreneurship Commitment on Entrepreneurship Intention *Int. J.*

Soc. Sci. Hum. Res. 05

[14] Liu Y, Guo Z and Zhang J 2023 How Entrepreneurship Education Promotes EntrepreneurialIntention among Chinese College Students: A Mediation Model *Front. Educ. Res.* 6 48–54

[15] Fayolle A and Gailly B 2015 The Impact of Entrepreneurship Education on Entrepreneurial Attitudesand Intention: Hysteresis and Persistence *J. Small Bus. Manag.* 53 75–93

[16] Koe W-L, Alias N E, Marmaya N H, Majid I A, Mohamad M and Mohamad M 2020 Likelihood inChoosing Technopreneurship as Career among Undergraduate Students *Int. J. Acad. Res. Bus. Soc. Sci.* 10

[17] Awan A, Haroon ul Hasnain M and Jawad Arshad H M 2023 Technopreneurship for DrivingEconomic Growth in Pakistan: A Comprehensive Literature Review *J. Policy Res.* 12 60–6

[18] Liu Y and Liang X 2024 Research on the Cultivation of Innovation and Entrepreneurship Ability ofCollege Students under the Background of Big Data *Appl. Math. Nonlinear Sci.* 9

[19] Xiao W 2022 An empirical study on entrepreneurial willingness and entrepreneurial rationality: based on an entrepreneurship questionnaire survey of Chinese college students

[20] Nunfam V F, Asitik A J and Afrifa-Yamoah E 2022 Personality, Entrepreneurship Education and Entrepreneurial Intention Among Ghanaian Students *Entrep. Educ. Pedagog.* 5 65–88

[21] Wei X, Liu X and Sha J 2019 How Does the Entrepreneurship Education Influence the Students' Innovation? Testing on the Multiple Mediation Model *Front. Psychol.* 10

[22] Shah I A, Amjed S and Jaboob S 2020 The moderating role of entrepreneurship education in shapingentrepreneurial intentions *J. Econ. Struct.* 9 19

[23] Ajzen I 1991 The Theory of Planned Behavior *Organ. Behav. Hum. Decis. Process.* 50 179–211

[24] Liñán F and Chen Y 2009 Development and Cross–Cultural Application of a Specific Instrument toMeasure Entrepreneurial Intentions *Entrep. Theory Pract.* 33 593–617

[25] Shirokova G, Osiyevskyy O and Bogatyreva K 2016 Exploring the intention–behavior link in student entrepreneurship: Moderating effects of individual and environmental characteristics *Eur. Manag. J.* 34 386–99

[26] Sánchez J C 2013 The Impact of an Entrepreneurship Education Program on EntrepreneurialCompetencies and Intention *J. Small Bus. Manag.* 51 447–65

[27] Moriano J A, Gorgievski M, Laguna M, Stephan U and Zarafshani K 2012 A Cross-CulturalApproach to Understanding Entrepreneurial Intention *J. Career Dev.* 39 162–85

[28] Zhai W 2024 Challenges and Ability Enhancement of College Students' Employment andEntrepreneurship in the Context of Big Data *Appl. Math. Nonlinear Sci.* 9

[29] Yan X, Gu D, Liang C, Zhao S and Lu W 2018 Fostering Sustainable Entrepreneurs: Evidence fromChina College Students' "Internet Plus" Innovation and Entrepreneurship

Competition (CSIPC) *Sustainability* 10 3335

[30] Lu G, Song Y and Pan B 2021 How University Entrepreneurship Support Affects College Students' Entrepreneurial Intentions: An Empirical Analysis from China *Sustainability* 13 3224

[31] Mwiya B, Wang Y, Shikaputo C, Kaulungombe B and Kayekesi M 2017 Predicting the Entrepreneurial Intentions of University Students: Applying the Theory of Planned Behaviour inZambia, Africa *Open J. Bus. Manag.* 05 592–610

[32] Fayolle A and Liñán F 2014 The future of research on entrepreneurial intentions *J. Bus. Res.* 67 663–6

[33] Shahroom A A and Hussin N 2018 Industrial Revolution 4.0 and Education *Int. J. Acad. Res. Bus. Soc. Sci.* 8

[34] Hair J F, Ringle C M and Sarstedt M 2011 PLS-SEM: Indeed a Silver Bullet *J. Mark. Theory Pract.* 19 139–52

[35] Wijaya M C and Kloping Y P 2021 Validity and reliability testing of the Indonesian version of the eHealth Literacy Scale during the COVID-19 pandemic *Health Informatics J.* 27

[36] Taber K S 2018 The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education *Research in Science Education* (Research in Science Education) pp1273–1296

[37] Henseler J, Ringle C M and Sarstedt M 2015 A New Criterion for Assessing Discriminant Validity inVariance-based Structural Equation Modeling *J. Acad. Mark. Sci.* 43 115–35

[38] Hair J F, Hult G T M, Ringle C M and Sarstedt M 2021 *A Primer on Partial Least SquaresStructural Equation Modeling (PLS-SEM)* (Thousand Oaks, CA: Sage)

[39] Chin W W 1998 The Partial Least Squares Approach to Structural Equation Modeling *Modern Methods for Business Research* ed G A Marcoulides (Mahwah, NJ: Lawrence Erlbaum Associates)pp 295–336

[40] Hulland J 1999 Use of partial least squares (PLS) in strategic management research: a review of fourrecent studies *Strateg. Manag. J.* 20 195–204