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Factors determining the entrepreneurial intentions among Chinese university students: the moderating impact of student internship motivation

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The development of entrepreneurship spirit among young people is instrumental in empowering and invigorating them to take up entrepreneurial activities and become entrepreneurs. Understanding the psychological motivations (behavioral intentions) for people to become entrepreneurs is essential for the development of requisite policy and for creating a sustainable environment for entrepreneurs to grow and survive. Grounded on the Theory of Planned Behavior (TPB), this paper examines the factors driving the entrepreneurial intentions of students by specifically examining how student internship motivations (SIM) moderate the impact of entrepreneurial attitude (EA), subjective norms (SN), perceived behavioral control (PBC), entrepreneurial education (EE), and entrepreneurial self-efficacy (ESE) on college students' entrepreneurial intentions (SEI). A total of 478 valid responses gathered via a self-administered questionnaire from Chinese College students were analyzed with SPSS-26 by applying multiple linear regression analysis, moderation, and slope analysis. Results indicate that EA, SN, PBC, EE, and ESE positively influence college SEI. Most importantly, the moderation and slope analysis indicate that SIM significantly but negatively moderates the impact of EA, SN, PBC, and ESE on the entrepreneurial intentions of college students. SIM, however, failed to significantly influence the effect of EE on the SEI. The inferences (both academic and practical) of these discoveries for the development of sustainable entrepreneurial and internship programs are deliberated.

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Introduction

The psychological characteristics school of thought labels entrepreneurs as people having exceptional values, attitudes, and desires that drive them to undertake entrepreneurial ventures (Dinis et al. 2013; Yusof et al. 2007). Entrepreneurs and the enterprise activities they generate are critical to economic development, especially when it comes to the challenge of job creation for the youth. Entrepreneurship is thus a strategic approach to resolving the recurrent economic problems of poverty (Moradi et al. 2020). It is also conceptualized as the control and organization of means to construct a groundbreaking economic system for the reason of gain or growth under conditions of risk and insecurity (Dollinger et al. 2010; Wu et al. 2019). The description of entrepreneurship can further be put into three processes: first, the prelaunch or opportunity recognition stage, second the launch/development and implementation stage, where the needed resources are gathered to start the business and finally, the post-launch stage, where the entrepreneur manages the business to grow and survive (Gielnik et al. 2020).

Furthermore, entrepreneurship is deliberated as a means of creating a competitive advantage and thus recommended for all educational systems, especially higher educational institutions, since it empowers students to fish out opportunities, engage in innovation, take and manage risk, and organize and coordinate resources to achieve their entrepreneurial dreams (Garcez et al. 2022; Schimperna et al. 2021). Education in entrepreneurship becomes a fundamental basis for developing good entrepreneurship spirits since it provides activities purposed at developing the mindset, skill set, and enterprising or entrepreneurial people for business creation (Fauchald et al. 2022; Hardie et al. 2022). It has also been accentuated that entrepreneurial education (EE) is discernible by creativity, curiosity, and emotion, unitization of knowledge and skills to handle real challenges and opportunities leading to innovations and the establishment of businesses (Colombelli et al. 2022; de Sousa et al. 2022). Additionally, entrepreneurship is a form of premeditated conduct, and the intent regarding a behavior comprises the motivation and enthusiasm of people to undertake a course of action (Arjanto and Mustiningsih, 2022; Larsen, 2022). Thus, the desire of individuals to be an entrepreneur is motivated by several factors such as personal autonomy, wealth, and freedom, and one of the mechanisms for achieving these motivating factors (personal autonomy, wealth, and freedom) to becoming student entrepreneurs is through the active participation of students in internship programs. Thus, internships have become very common for tertiary education in many industrialized nations, which open doors for students to get job placement and entrepreneurial training experiences (Baert et al. 2021; Margaryan et al. 2022). Consequently, internship activities are powerful learning mechanisms to empower students to make adequate connections between classroom experience and the world of work knowledge (Di Meglio et al. 2022; Lee et al. 2022). This supplements the hands-on execution of professional knowledge learned from the college/university (McAlexander et al. 2022; Şekerci et al. 2021). Through internship programs, students can further learn good work habits and values that will be required for them to succeed at their place of work (Di Meglio et al. 2022; Odlin et al. 2022) and as aspiring entrepreneurs.

The purpose of this study is to interrogate the entrepreneurial intention of Chinese college students by experimenting with the moderating impact of student internship motivation (SIM) on entrepreneurial intentions based on the theory of planned behavior (TPB) framework. The TPB framework is widely applied in psychology and other domains, such as management, education, occupational health, and environmental sciences, to predict and explain changes in human behavior (Ajzen, 2020; Sussman and Gifford, 2019). It provides a better realization of the objectives of this study, which specifically tests the moderating influence of SIM on the relationship between entrepreneurial attitude (EA), subjective norm (SN), perceived behavioral control (PBC), EE, entrepreneurial self-efficacy (ESE) and student entrepreneurial intentions (SEI). Student internship programs are considered one of the modes by which students are empowered to learn how the real working environment operates and to build entrepreneurial competencies. More so, internship programs for students have become vital, especially given the better post-COVID-19 pandemic conditions (reduced infections and spread of the virus), which have led to fewer lockdowns and restrictions. In the periods of the pandemic, many companies and university institutions were severely impacted by the strict COVID-19 control and prevention measures forcing them to shut down fully or partially or move activities online (Babbar and Gupta, 2022; Quattrone et al. 2022). This disrupted internship programs around the world, including in China (Teng et al. 2021; W. Zhang et al. 2021a), and prevented schools and companies from collaborating to arrange for placement internships for college students. The current reduced levels of infections and spread of the virus, along with the regular COVID-19 nucleic acid testing among the people, have empowered governments to relax the COVID-19 control and preventive measures (Devi et al. 2022; Xavier et al. 2022). This relaxation of COVID-19 control and measures provides companies the opportunity to collaborate with educational institutions to organize effective internship programs for students. This on-site or in-person internship placement will yield more beneficial outcomes for students' entrepreneurial ambition development than the virtual internship programs that were implemented during the heat of the COVID-19 lockdown and restrictions.

Mensah et al. (2021) argue that SIM is directly related to college students' entrepreneurial intentions (SEIs). Apart from this validated impact of SIM on SEI, no study has tried to validate the moderating effect of student internship programs on the relationship between EA, SN, PBC, EE, ESE, and SEI. This study is novel in terms of providing a new research model to validate the moderating impact of SIM on SEI via EA, SN, PBC, EE, and ESE. The moderating construct has broadened the discussions from the narrower directional impact of SIM on entrepreneurial intention presented in Mensah et al. (2021) to the broader perspective it offers as a holistic approach to comprehending the importance of student internship activities on the development of entrepreneurial interests among students. This is a unique theoretical contribution to the entrepreneurship literature and provides practical guidance to the proper implementation of internship programs by universities to ensure that internship placement provides maximum benefits to students to get relevant job skills that match their course of study. For instance, researchers have shown that EA, SN, PBC, EE, and ESE are significantly related to SEI (Lv et al. 2021; Mbwambo and Magoma, 2022; Ngo et al. 2022; Yousaf et al. 2021). However, the studies cited above and others fail to consider how student internship activities can moderate the impact of these factors on the students' intention to engage in entrepreneurial activities. Consequently, this study sets itself apart from other studies, as indicated above, through its theoretical contributions to the literature, which specifically examines the moderating influence of students' internship activities on the interaction between EA, SN, PBC, EE, ESE, and SEI. The major theoretical contribution of this study shows that internship motivation (SIM) significantly but negatively moderates the impact of EA, SN, PBC, and ESE on the college SEI. SIM, however, failed to significantly influence the impact of EE on the SEI. It highlights a gap between existing EE

and real entrepreneurship in China, which may cause a gap between students' entrepreneurial intentions and activity. The main hypothesis of this research is that SIM moderates the impact of EA, SN, PBC, EE, and ESE on SEI.

The research is organized as outlined: research theoretical foundation and formation of hypothesis, model, methodology, results, and data analysis, discussions along with implications, conclusion, constraints, and future of the study.

Research theoretical foundation and hypothesis formation

Theory of planned behavior. Numerous concepts have been advanced to forecast and elucidate people's behavior but all these theories have been applied mostly to understand individual adoption and utilization of new technological systems, except the TPB, which has been mainly utilized in entrepreneurial and entrepreneurship investigation. The TPB thus becomes the most suitable concept that applies to the setting of this paper since it empowers the better prediction of the EI behavior of the study as compared to the other competing theories.

The TPB is considered to have been developed from the theory of reasoned action (TRA) advanced by Ajzen (1985). The TPB integrates PBC as a precursor to behavioral intention (Ajzen, 2020; Ulker-Demirel and Ciftci, 2020). It proposes that the action and performance of people's behavior are influenced by three key constructs attitudes toward the behavior, SN, and PBC (Ajzen, 1985). All these three factors culminate in the development of intent toward behavior which ultimately impacts consumer behavior (Ajzen, 1985, 2005). The TPB has been used extensively in diverse behavior studies ranging from utilization of drugs and reutilizing to decisions on kind of travel, from sex to customer conduct, and from the adoption of technology to protection of privacy (Ajzen, 2020). Furthermore, the TPB expands the nature of pure volition control indicated in the theory of reason of action (Ajzen, 2020). This is based on the adding of beliefs concerning the possession of required resources and opportunities for undertaking a given course of action (Chan et al. 2020; Yadav and Pathak, 2017). In other words, the more resources and chances that users believe they have, the better will be their professed behavior control over their conduct (Tan et al. 2017). TPB predicts two possible impacts of PBC on behavior. First, PBC has to do with motivational elements that have an indirect influence on behavior via intention (Verma and Chandra, 2018). Secondly, PBC deals with actual control and impacts directly on the association with behavior not mediated by intention (Gao et al. 2017; Verma and Chandra, 2018).

The utilization of TPB in this study is because it has been extensively applied and tested in multitudes of entrepreneurship studies, and thus its validity and reliability can be guaranteed. For instance, based on the TPB framework, it was discovered that philanthropical, biospheric, hedonic, and self-centered values have an indirect impact on sustainability-driven EI, which was in turn considered as the means of understanding attitudes towards sustainability of entrepreneurship and PBC (Yasir et al. 2021). The same work indicated that PBC and social norms drive the intent to become a sustainable entrepreneur (Yasir et al. 2021). Another research indicated that EE does not drive entrepreneurial intentions directly but is indirectly mediated by three constituents of TPB (personal attitude, SN, and PBC) and ESE (Maheshwari and Kha, 2022). Furthermore, in a related study, it was confirmed that SN was not a determinant of EI, perceived risks have a negative effect on PBC and male engineering students were found to have higher levels of EI than their female counterparts (Dao et al. 2021). Also, a study showed that the positive effect of attitude toward behavior and PBC on social entrepreneurship intentions was reinforced when students undertook entrepreneurship activities at the university and had non-business majors (Chang et al. 2022).

Furthermore, research grounded on the fundamentals of TPB demonstrates that ESE showed a positive and significant mediating effect on the interaction between EE and EI (Wang et al. 2023). The study also suggests that psychological capital positively moderated the influence of ESE on EI (Wang et al. 2023). Another study integrating the concepts of TPB, locus of control, and cyber EE showed that cyber entrepreneurship education (EE) had a positive moderating influence on the relationships between attitudes and intentions and between SN and intention (Tseng et al. 2022). It also demonstrates a negative moderating impact on the interaction between PBC and intention (Tseng et al. 2022). Again the study showed that cyber EE moderated positively the interaction between TPB reasoning concepts and cyber EI (Tseng et al. 2022). EE, in another study, was shown to be a significant mediator of the interaction between entrepreneurial motivation, family support, individual self-efficacy, and EI (Saoula et al. 2023).

Formation of hypothesis

Entrepreneurial attitude. Attitude is considered the propensity to take any action (positive or negative) towards or against something in a particular situation (Tiwari et al. 2017). Individual attitude is the totality of individual concepts and beliefs as well as the means of evaluating those belief systems (Gloss et al. 2017; Tiwari et al. 2017). It was highlighted that the conduct of a person is based on individual attitudes and beliefs, and this, in turn, shapes a person's actions/behaviors (Schierjott et al. 2018; Tiwari et al. 2017). Attitude regarding conduct is well-defined as the magnitude to which a person undertakes a good or bad valuation of the conduct under consideration (Ajzen, 2020). An attitude thus can be said to be an evaluative response. An EA is an evaluative feeling of entrepreneurship that is based on the beliefs and assessment of entrepreneurs (Maydiantoro et al. 2021; Saleh et al. 2021). EAs are thus considered behavioral characteristics that can empower entrepreneurs to grow and be successful in their chosen businesses (Ewa and Łuczka, 2020; Saleh et al. 2021). Some of the characteristics of EAs are determination, strong work ethics, integrity, willpower, confidence, comprehensive alertness, realistic approach, adaptability and flexibility, passion, etc. Additionally, EAs may be developed based on the satisfaction of starting a business and the quality of life that comes with originating and growing your enterprise (Baluku et al. 2021; Maydiantoro et al. 2021). Consequently, students who demonstrate good standards of EAs will be in a better position to crave entrepreneurial activities. Various research studies have demonstrated that the growth of a strong EA is strongly associated with the behavioral intention to partake in entrepreneurial deeds (Lingappa et al. 2020; Maydiantoro et al. 2021; Rahman et al. 2022; Wach and Bilan, 2021). Consequently, H1 was proposed.

H1: *EA has a positive influence on the EI of college students.*

Subjective norms. SN is conceived as the observed social influence and forced to participate or not in a given conduct (Kashif et al. 2018; Taufique and Vaithianathan, 2018). SNs relate to how people think they will be perceived by people around them if they decide to undertake a particular course of action (Nisson and Earl, 2020; Sun et al. 2020). It comprises the social pressures from family, friends, and other important people in society that may force individuals to engage in a certain form of activity. Put together, the SN is the people's discernment of how pressures society can influence them to perform or not undertake a course of behavior in a particular circumstance (La Barbera and Ajzen, 2020; Tiwari et al. 2017). Chinese society is endowed with

collective cultural characteristics where social framework and foundation are the bedrock, and thus issues of SNs are dominant. Within Chinese society, friends, family, and other key actors in society influence individual choices and decision-making processes. Thus, it is, very vital to appreciate how SNs can influence individual Chinese students to undertake entrepreneurial activities/behaviors. Research has validated that SN has a direct link with EI (Attahiru et al. 2020; Lu et al. 2021; Rahman et al. 2022). H2 was accordingly projected.

H2: *SN has a positive influence on the EI of college students.*

Perceived behavioral control. PBC has to do with a person's opinion of their capacity to participate in a course of action (Ajzen, 2002, 2020). Perceived behavior control deals with situations where people may not have the resources or absence whole volitional control over specific conduct of concern (Ajzen, 2020; Elie-Dit-Cosaque et al. 2011). The notion was presented in the TPB to house the non-control characteristics that are potentially inherent in all human behavior (Luan and Lin, 2020; Nayanajith and Damunupola, 2019). PBC potentially influences the intention of an individual to participate in any task or entrepreneurial activity (Rachbini, 2018; Vamvaka et al. 2020). Higher levels of perceived control empower and strengthen people's intention to undertake a behavior and thus consolidate an upsurge in effort and determination (Ajzen, 2020; Yuriev et al. 2020). PBC provides vital information as to what control a person can demonstrate in a given situation and therefore can be used to predict behavior (Shan et al. 2020; Vamvaka et al. 2020). Students' ability to demonstrate their competence in terms of control over their business decision process will be more likely to undertake entrepreneurial activities. Research has shown that PBC is connected positively with the behavioral intention to participate in entrepreneurial actions (Adhikusuma and Genoveva, 2020; Youssef et al. 2021). Accordingly, H3 was proposed.

H3: *PBC has a positive influence on the EI of college students.*

Entrepreneurship education. EE is considered as any form of pedagogic package or content/procedures of education to grow and mature individual entrepreneurial skills and attitudes (Jena, 2020; Linton and Klinton, 2019). It can take the form of a traditional or formalized system that teaches, trains, and enlightens students on the innovative steps to develop and own a business from conception to actualization (Barba-Sánchez and Atienza-Sahuquillo, 2018; Linton and Klinton, 2019). Educational institutions such as universities and colleges serve as a good environment for people to acquire quality entrepreneurship knowledge and skills for business development and self-employment (Linton and Klinton, 2019). Global University Entrepreneurial Spirit Students' Survey (GUESSS) indicates that EE and the entrepreneurial environment existing at the university are major drivers of students' EI and activities (Philipp et al. 2021). Additionally, EE components such as entrepreneurial skills, entrepreneurial learning, and entrepreneurial intention are considered to drive positively technology-based business development (Dana et al. 2021). EE that is directed and focused on developing people's competence and skills is said to have yielded more influence on the tendency of students to develop a new enterprise/business (Ahmed et al. 2020; Nabi et al. 2017). It has been accentuated that for EE to have a maximum effect, it should concentrate on taking action, forecasting, and daring into unfamiliar prospects (Galvão et al. 2018; Ndofirepi, 2020). Delivering adequate EE at the university was shown to drive entrepreneurial behaviors since it impacts positively attitudes and skills that encourage entrepreneurial intentions among students (Nguyen and Duong, 2021). It was further elaborated that EI can be nurtured and enhanced via EE and that EE is significantly associated with entrepreneurial intention (Ramadani et al. 2022). Other past investigations have likewise confirmed that EE encourages the intention to participate in entrepreneurial undertakings and self-occupation intentions (Kisubi et al. 2021; T. Nuseir et al. 2020). This paper proposes that students who are exposed to good standards of EE and training will harbor the entrepreneurial intention to develop their businesses. Consequently, H4 was proposed.

H4: *EE will positively influence the EI of college students.*

Entrepreneurial self-efficacy. Self-efficacy is conceived as the individual dogmas concerning their competencies to show control over their standard of performance or function and over situations that concern their lives (Bandura, 1977). The notion of self-efficacy differs from PBC, which is based on the ability to undertake specific behavior (Ajzen, 2002). Perceived self-efficacy is the consistent confidence in a person's abilities to form and implement actions needed to produce an expected outcome (Bandura, 1986; Lippke, 2020). The concern here is with control over the behavior itself, not with control over outcomes or actions (Ajzen, 2002). On the surface, PBC and self-efficacy sound similar (Ajzen, 2002), but scholars have provided empirical support to differentiate these two concepts. Self-efficacy is made up of internal control features like skills and knowledge, which reflect individual perceptions about the ease of use or struggle in executing a particular action or behavior (Vamvaka et al. 2020). ESE is the intensity of entrepreneurs' self-assurance in their entrepreneurial competence and skill possessed to complete diverse entrepreneurial behavior and succeed (Li et al. 2020; Wei et al. 2020). Depending on environmental and individual factors, entrepreneurs can strengthen their capability to withstand and manage negative emotions and pressures within a given entrepreneurial setting (Wei et al. 2020; Wu et al. 2020). ESE can be acquired, modified, and improved to take advantage of any entrepreneurial venture. Students who demonstrate the ability of higher standards of self-efficacy in entrepreneurial activities are more susceptible to undertaking ventures in entrepreneurship. Past research has established that ESE is connected positively with EI (OK et al. 2020; Y. Zhang et al. 2021b). Accordingly, H5 was put forward.

H5: *EE will positively influence the EI of college students.*

Moderating the impact of SIM. The SIM construct utilized in this work seeks to describe the perception and intent of students concerning internship programs rather than the outcomes of the internship or undertaking of any actual internship programs. Student internship is an integral part of higher education, and students most often are encouraged by their institutions/universities to undertake internship work-related activities during school holidays. Internship for some universities and colleges is a vital and mandatory part of the student's course of study and for graduation (Januszewski and Grzeszczak, 2021). Internships build and create a real working condition/space where learners can cultivate their minds and skills through practical experience (applied training) (Januszewski and Grzeszczak, 2021; Martín-Lara et al. 2019). Empowering students' employability is one cardinal goal of students' internship programs and activities. Internships are considered three-way cooperation among institutions of higher education, an employment place (company), and a student intern, which gives students the chance to apply classroom learning to a practical environment (Lei and Yin, 2019). These interactions enable the professional and personal development of students' business desires and aspirations (Anjum, 2020). Furthermore, studies have experimentally proven a strong affirmative connection between student internship programs and the development of entrepreneurial intention among college students (Mensah et al. 2021; Yi, 2018; Zreen et al. 2019). Nevertheless, past and current literature has failed to test the

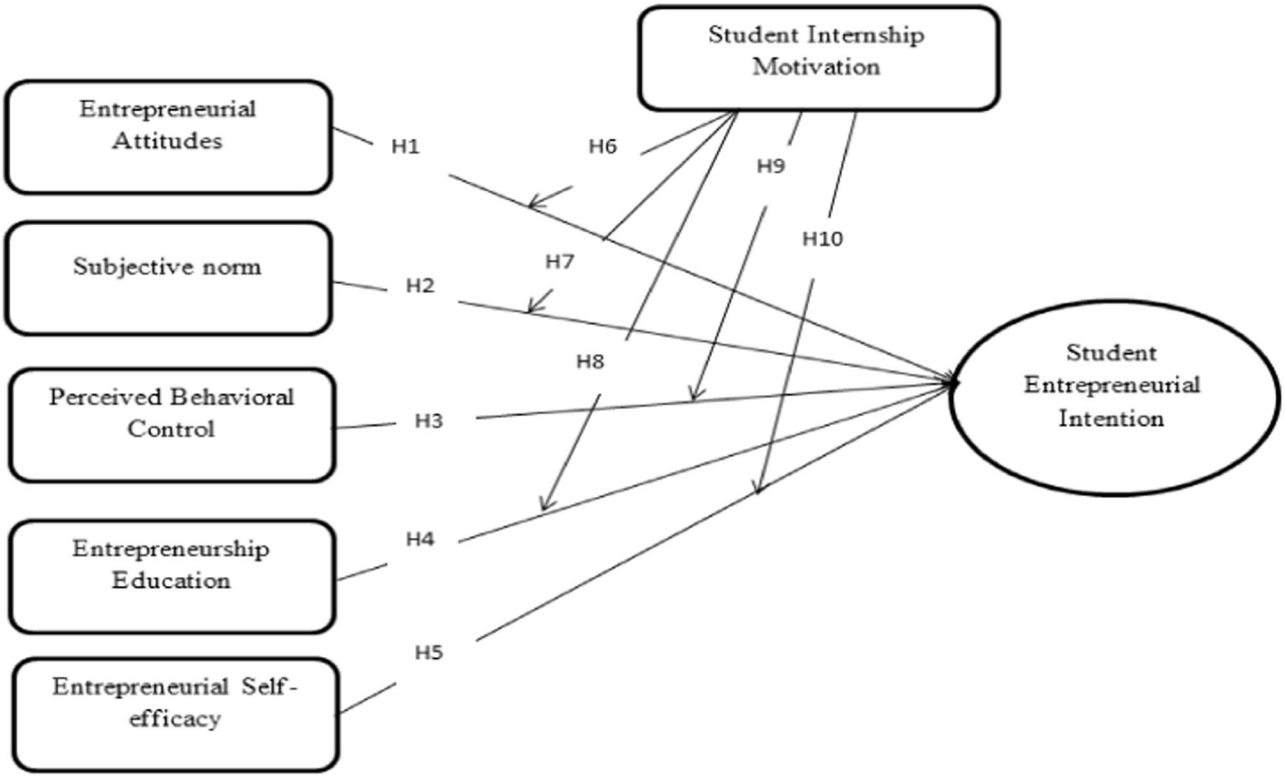

Fig. 1 The proposed model of theory of planned behavior (TPB). SIM predict to moderate the impact of EA, SN, PBC, EE, and ESE on student EI.

moderating influence of SIM to moderate the impact of EA, SN, PBC, EE, and ESE on entrepreneurial intention. Thus, this paper advances that adequate student internship among university students can contribute to enhancing the predictive power of each of these constructs (EA, SN, PBC, EE, and ESE) on the student's desire to take up entrepreneurial activities. Consequently, H6, H7, H8, H9, and H10 were proposed.

H6: *SIM moderates the relationship between EA and the EI of college students.*

H7: *SIM moderates the relationship between SN and the EI of college students.*

H8: *SIM moderates the relationship between PBC and the EI of college students.*

H9: *SIM moderates the relationship between EE and the EI of college students.*

H10: *SIM moderates the relationship between ESE and the EI of college students.*

Research model

The research model grounded on the research context and propositions advanced in the previous segment are presented in Fig. 1. SIM is projected to moderate the impact of EA, SN, PBC, EE, and ESE on student EI.

Research methodology

The methodological processes utilized to undertake this study are adequately explained in the sub-sections that follow, which pertain to instrument development, sampling technique, data analysis tools used, and checking of common method bias.

Instrument. Introducing students to entrepreneurship concepts early in their youth formation stages could be instrumental in developing their entrepreneurial behaviors. The placement of this study within the students' domain is thus important which will provide vital empirical results to advance the importance of internship activities on self-employment and entrepreneurship development among students. To fully validate the proposed research conceptual framework of this work, a research (quantitative) questionnaire technique was designed to permit the data collection and subsequent analysis. The constructs in the instrument were picked from past literature after an extensive literature review but were restructured to reflect the contextual setting of this study. The items were adopted in this manner: EAs and entrepreneurial intention (Lu et al. 2021; Ozaralli and Rivenburgh, 2016), SNs (Muliadi and Mirawati, 2020), PBC (Ajzen, 1985; Vamvaka et al. 2020), EE (Liñán et al. 2011; Turker and Selcuk, 2009), ESE (Shahab et al. 2019), and SIM (Mensah et al. 2021). These variables were selected to create the research model (Fig. 1) investigated in this paper since it will empower the better achievement of the objectives (the moderating impact of SIM in the advancement of students' entrepreneurial behavioral intentions) of the paper.

Each construct contained three questions and they were examined on a five (5) point Likert scale which ranged from 1 = strongly disagree to 5 = strongly agree. The number of questions per variable utilized in this current study was shortened to 3 items to improve the reliability of the items previously used (i.e., 5 items in Mensah et al. 2021) and also to obtain a better agile instrument that is easier and quicker to administer. The instrument contained two segments. The first segment contained material concerning the construct items under study in this paper, while the other part reflected the basic information about the respondents. The basic information included age, gender, education, future plans, and the school where the student studies. For the respondents to have a maximum appreciation of the questions posed in the instrument, the instrument was transformed from English into the Chinese Language. A back translation was further undertaken to ensure that there were no deviations and distortions from the original intended meaning of

Table 1 Descriptive statistics of main variables.

	Mean	SD	1	2	3	4	5	6	7
1. Entrepreneurial attitudes	3.449	0.489	1						
2. Subjective norm	3.399	0.447	0.350***	1					
3. Perceived behavioral control	3.787	0.731	0.209**	0.148***	1				
4. Entrepreneurship education	3.498	0.510	0.245***	0.245***	0.103*	1			
5. Entrepreneurial self-efficacy	3.393	0.472	0.185***	0.236***	0.246***	0.274***	1		
6. Student internship motivation	3.520	0.517	0.115**	0.105*	0.163***	0.139**	0.142**	1	
7. Students' entrepreneurial intention	3.620	0.425	0.220***	0.223***	0.254***	0.241***	0.267***	0.276***	1

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

items in the questionnaire. Back translation is the conversion of a questionnaire back into the original language and comparison of the two (2) original-language varieties to detect inconsistencies (mistakes in the actual translation i.e., from the source into the targeted language) between these versions (Son, 2018; Yokokawa et al. 2022). We conducted a piloting and pre-testing study with 100 students to test the comprehensiveness of the questionnaire which is considered a good characteristic of a well-designed study. However, the outcomes of the pre-testing and piloting study were not incorporated into the ultimate results. Piloting and pre-testing provide valuable insights to researchers and, thus, provide fundamental settings for the major study (Lancaster et al. 2004; Van Teijlingen and Hundley, 2001). It outlines the early warning signs about the possible challenges with the proposed methods and instruments in terms of their appropriateness and applicability (Bjerre et al. 2018; Van Teijlingen and Hundley, 2001). Some of the reason driving the researchers to undertake pilot and pre-testing includes: designing and testing the acceptability of research instruments, determining the feasibility of the full-scale research, determining the logistical challenges using the proposed methods, collecting preliminary data, and the assessment of data analysis techniques (Mikuska, 2017; Van Teijlingen and Hundley, 2010). The outcome of the pretesting helped to reframe some of the questions and thus contributed to improving the content of the instrument. Ethical review and approval for this study was obtained as per institutional requirement. The researcher informed the participants that the involvement in the study was not mandatory (i.e., voluntary), and thus all the respondents participated in the survey of their own volition. Informed consent was obtained from all the participants, with special emphasis that no personal identifying information provided would be disclosed to any unauthorized third party and that the information provided was to be utilized for the purpose of this study alone. Thus, the confidentiality and anonymity of their information were guaranteed.

Sampling technique. The convenient sampling framework was applied as a sampling approach to collect data from the respondents. The convenient sampling technique is deliberated as a non-likelihood sampling system that targets a population that is easily accessible and reachable (proximity and time as well as the readiness to partake in the research) (Etikan et al. 2016; Stratton, 2021). It is a widely used approach due to its affordability, easiness, and ready population to draw from (Hu and Qin, 2018; Speak et al. 2018). The study population is college students who are undertaking various courses of study at the university (Jiangxi University of Science and Technology) in Ganzhou City, Jiangxi Province, China. The questionnaire instrument was put online and the links were disseminated through social media systems such as WeChat and QQ. Social media was used since it provides easy access to respondents who are frequently (readily available) on social media (especially on WeChat). The data collection lasted for two (2) months (March to April 2022). A total of 478 valid responses were recorded and subsequently used for analyzing the data. The research decided to use the 478 samples acquired since it is more than the minimum sample of 380 required using the sample calculator (calculator.net, 2022) indicators of confidence internal level (95%), a margin of error (5%), population proportion (50%) and estimated population size of 30,000 students. This thus demonstrates the adequacy and representative nature of the samples of 478 used for the data analysis.

Data tools and analysis. We used the Statistical Package of Social Science (SPSS-26) for data computation and analysis. Additionally, we used Hayes's process program for SPSS—Model 1, slope analysis, and the Johnson–Neyman test for moderation analysis (Hayes, 2013). The other statistical tests were: descriptive statistics, scales reliability test, Pearson correlation, common method bias, and multiple linear regressions.

Common method bias (CMB). To test the common method variance in this study, we applied Harman's single-factor analysis to examine CMB, and if it exists due to self-reporting measures. Results indicate a total CMB of 20.824% extracted through Harman's single-factor analysis, which is substantially lower than the recommended standard of 50% total variance. Additionally, Person correlation analysis indicates that there is no high bivariate correlation between constructs ($r > 0.90$) (Podsakoff et al., 2003) (see Table 1). Hence, CMB is not found in this study.

Demographics. This study analyzed 478 valid responses that included 271 female (56.7%) and 207 male (43.3%) students from Jiangxi University of Science and Technology in Ganzhou City, Jiangxi Province, China. Majority of the students enrolled in undergraduate degrees ($N = 289$, 60.5%) and master's degrees ($N = 173$, 36.2%) programs. Only 16 students (3.3%) were enrolled in Ph.D program. The population of this study is relatively young, as 325 respondents fall into the 18–21 years age bracket. In addition, 86 (18%) participants were aged between 22–25 years and 65 (13.6%) participants were aged between 26–30 years. Only 2 participants were above 30 years old. The majority of the respondents ($N = 213$, 44.6%) were sure (Yes very likely) to become an entrepreneur in the future. In addition, 156 respondents (32.6%) indicated that they were not sure about becoming an entrepreneur in the future. Only 69 (22.8%) participants indicated that they were not likely to be an entrepreneur in the future.

Results and data analysis

Descriptive statistics. Descriptive statistics comprising of means, standard deviations, and correlations of all the constructs of this study are presented in Table 1. The outcomes show that all variables i.e., EA, SN, PCB, EE, ESE, SIM, and SEI, are correlated

positively with each other. The means and standard deviation of all variables are in the anticipated path of this work.

Reliability analysis. Grounded on previous studies, we run the reliability tests such as exploratory factor analysis by using the principle components analysis to extract the variable's factor loadings. Composite reliability tests, Cronbach's alpha, and average variance extracted (AVE) were also conducted to further validate the dependability of the variables in our work. Table 2 indicates that tests meet the required standard threshold values of construct factor loadings (<0.600), Cronbach alpha and composite reliability threshold values of 0.700, and AVE standard threshold value of <0.500 variance (Hair, 2011; Hair et al. 2010). Hence, the results demonstrate the construct reliability and validity in this study.

Regression Analysis. Multiple linear regression analysis was applied to test H1, H2, H3, H4, and H5. We hypothesized that EA, SN, PBC, EE, and ESE would positively influence college students' EI. Results demonstrate that all the predictor variables i.e., EAs ($\beta = 0.077$, $p < 0.05$), SNs ($\beta = 0.094$, $p < 0.05$), PBC ($\beta = 0.099$, $p < 0.001$), EE ($\beta = 0.114$, $p < 0.01$), and ESE ($\beta = 0.134$, $p < 0.001$) have a significant positive impact on the college SEIs. Hence, the model significantly supports the H1–H5 ($R^2 = 0$ 0.157, $p < 0.001$) respectively (Table 3).

Moderation hypotheses analysis. To test hypotheses H6–H10, we used Hayes's (2013) moderation process program for SPSS to examine the moderation effects of students' internship motivation on the interaction between college students' EA and EI; between college students' SN and EI; between college students' PBC and entrepreneurial intentions; between college students' EE and EI; and between college students' ESE and EI. Firstly, we selected Model 1 from the Hayes templates to observe the moderation effects of students' internship motivation on the aforementioned relationship between independent variables and dependent variables. A bootstrapping procedure with 5000 samples (95% confidence level of confidence interval, and bias-corrected) was used for moderation analysis. Results indicate that SIM has a significant but negative moderating influence on the relationship between college students' EA and EI ($\beta = -0.1918$, $p < 0.01$); between college students' SNs and EI ($\beta = -0.2432$, $p < 0.001$); between college students' PBC and entrepreneurial intentions ($\beta = -0.1369$, $p < 0.01$); and between college students' ESE and entrepreneurial intentions ($\beta = -0.1999$, $p < 0.01$). However, we did not find any moderation influence of SIM on the relationship between college students' EE and EI ($\beta = -0.0089$, $p =$ n.g) (Table 4). Hence, results support H6–H8, and H10 but reject H9.

We also applied simple slope analysis to further understand the nature of moderating influence on the interaction between independent and dependent constructs, as displayed in Figs. 2–5. Figures 2–5 demonstrate that the lines are much steeper for low SIM, indicating that the impact of predictor variables (i.e., EA, SN, PBC, and ESE) on the outcome variable (SEI) is much higher as compared to the high SIM. It means that if the level of SIM increases, the strength of the interaction between independent variables (i.e., EA, SN, PBC, and ESE) and dependent variable (SEI) will be decreased.

To further demonstrate the results, we also applied the Johnson–Neyman test to identify the range of values of the moderator variable (SIM) in which the slope of the predictor's variables (i.e., EA, SN, PBC, and ESE) is significant vs. non-significant at $p < 0.05$. Results reveal that the impact of SIM on the relationship between EA and SEI is significant till the value of SIM is increased to 3.9260 if the value increases further, there will be no moderating influence of SIM on the relationship between EA and SEI. Similarly, the moderating influence of SIM on the relationship between SN and SEI is significant till the value of SIM is increased to 3.8854, if the value increases further; there will be no moderating influence of SIM. The impact of SIM on the relationship between PBC and SEI is significant till the value of SIM is increased to 3.8864 and the moderating influence of SIM on the relationship between ESE and SEI is significant till the value of SIM is increased to 4.0357 if the value increased further, there will be no moderating influence of SIM.

Discussion

This paper examined the factors driving entrepreneurial behavior among college students. Entrepreneurship development, cultivation, and promotion among college students are crucial to sustainable job creation and reduction in the level of economic inequalities between generations. Student internships are thus one of the major mechanisms to promote and encourage students to take the path of spirited entrepreneurship and be involved in entrepreneurial undertakings. This paper specifically examines the role of SIM in moderating the impact of these factors (EA, SN, PBC, EE, and ESE) on entrepreneurial intention among university students. The outcomes have demonstrated that EA, SN, PBC, EE, and ESE were directly influential in driving students' entrepreneurial intention behaviors. Additionally, the moderating analysis showed that SIM was significant in moderating the impact of EA, SN, PBC, and ESE on students' entrepreneurial intention. However, SIM was not significant in moderating the influence of EE on college students' EI.

The positive significant impact of EA on SEI is supported by previous literature that has also confirmed the positive effect of EA on EI (Barba-Sánchez et al. 2022; Cano et al. 2022; Wardana et al. 2021). This means that developing students' mindsets and attitudes toward entrepreneurship can empower them to emulate how business people think and act, especially when it comes to identifying and taking advantage of opportunities. Thus, a good entrepreneurial mindset among students should make them see mistakes as a chance to get better. Activities that can help students build and acquire needed mindset and attitudes towards entrepreneurship include motivating students to take the path of project-based learning systems, encouraging students to think broadly, encouraging students to take bold actions, and constantly encouraging students to picture what they can achieve. The university environment, thus should be a good place to model students' mindset set and attitudes toward entrepreneurship and once students have that concrete EA, it will have a subsequent impact on driving students to engage in entrepreneurial actions.

Furthermore, studies have also corroborated our findings that SN is significantly connected to EI (Contreras-Barraza et al. 2022; Ngan and Khoi, 2022; Su et al. 2021). This implies that the social environment in which students live or stay (grow in) and the nature of comments from people close to them, like family and friends, can either discourage or encourage them to engage in entrepreneurial behaviors. Expression of opinions and experiences of close friends, colleagues, and family members toward the activities of entrepreneurship, if positive and supportive, may motivate students to take the path of entrepreneurship, but if the other way round, it will demoralize them and drive away their interest in becoming entrepreneurs. Also, the direct impact of PBC on SEI is in line with studies that have empirically shown that PBC is directly related to EI (Che Nawi et al. 2022; Kim and Lim, 2022; Virasa et al. 2022). This means that when students are given the right education and training, they will develop the right PBC mechanisms to cultivate the entrepreneurial intention of

Table 2 Reliability analysis.

Variables	Items	Factor loading	Composite reliability	Cronbach alpha	Average variance extracted
Entrepreneurial attitudes	EA1: To be an entrepreneur is beneficial.	0.973	0.954	0.93	0.875
	EA2: To be an entrepreneur is an attractive occupational path.	0.915			
	EA3: To be an entrepreneur is satisfying and adequate.	0.916			
Subjective norms	SN1: Friends and family encourage me to take up an entrepreneurial path/job.	0.770	0.844	0.78	0.643
	SN2: Friends and family will be happy and proud of me for engaging in entrepreneurial activities.	0.834			
	SN3: Friends and family think that entrepreneurship is a good decision.	0.802			
Perceived behavioral control	PBC1: I think is easy for me to start my own business.	0.900	0.924	0.89	0.802
	PBC2: I can create and manage the business formation steps.	0.907			
	PBC3: I have the required expertise and know-how in the business I want to do.	0.880			
Entrepreneurship education	EE1: An entrepreneurship program improves my skill set to handle challenges and indecision.	0.829	0.854	0.77	0.661
	EE2: An entrepreneurial program gives me a better view of the nature and attitudes of entrepreneurs.	0.803			
	EE3: An entrepreneurial program prepares me to appreciate the financial skills required for entrepreneurship activities.	0.824			
Entrepreneurial self-efficacy	ESE1: I have high confidence to succeed as an entrepreneur.	0.811	0.847	0.84	0.649
	ESE2: I am confident to handle whatever comes my way as an entrepreneur.	0.830			
	ESE3: I have the self-drive that propels me to accomplish any entrepreneurial task.	0.777			
Student internship motivation	SIM1: I believe that internships will get me ready for job placement.	0.775	0.842	0.73	0.641
	SIM2: My entrepreneurial dreams can be impacted by internships.	0.825			
	SIM3: Undertaking an internship during the school holidays is something I will prefer.	0.800			
Students' entrepreneurial intention	SEI1: I have a strong desire to become an entrepreneur.	0.729	0.832	0.77	0.625
	SEI2: I have plans to start my own company/ business.	0.780			
	SEI3: My target is entrepreneurship, and I will be an entrepreneur in the future.	0.857			

managing their businesses. With adequate exposure either through the university environment or self-learning processes, students can develop the right PBC mechanisms (competencies) to be good and successful at becoming entrepreneurs. Our finding, however, contradicts research that revealed that there is no statistically significant connection between PBC and EI (Rahman et al. 2022).

Additionally, the significant influence of EE on SEI does support research findings that have validated that EE is significantly connected to EI (Alferaih, 2022; Paliwal et al. 2022; Uddin et al. 2022). It is thus imperative that universities and institutions put in the correct mechanisms to advance the nature and content of the EE and training programs executed at the university level for college students. Students must therefore see concrete values in these programs that seek to transform them into entrepreneurs. Also, EE should integrate traditional classroom teaching systems with entrepreneurial practice, which should serve as a basis to motivate the passion of learners to actively partake in EE. Teachers of EE should have higher professional qualities to offer high-quality EE to students. The quality of the support provided by universities to entrepreneurial teaching and practice among students, such as tax incentives, free offices, and funding can be fundamental to stimulating EI among students (Wang et al. 2023).

The direct influence of ESE on SEI is in agreement with studies that have demonstrated that indeed ESE is connected positively to EI (Colombelli et al. 2022; Gupta, 2022; Wu et al. 2022). This means the development of students' self-efficacy in terms of entrepreneurship development should be a top priority for educational institutions since ESE is an undisputable ingredient for one to become a successful entrepreneur. The development of self-efficacy toward entrepreneurship can happen through dedicated education programs that can deliver performance accomplishments, vicarious knowledge, verbal encouragement, and physiological environments for students. The level of ESE displayed by students can influence the way they take business actions and continue to engage in the transformation of these ideas into profitable ones. That is a good level of ESE is fundamental for students to advance novel products and identify opportunities in the market; construct state-of-the-art systems,

Table 3 Multiple regression analysis.

	Students' entrepreneurial intention	Decision
Main effects		
1. Entrepreneurial Attitudes	0.077*	H1 supported
2. Subjective Norm	0.094*	H2 supported
3. Perceived Behavioral Control	0.099***	H3 supported
4. Entrepreneurship Education	0.114**	H4 supported
5. Entrepreneurial Self-efficacy	0.134***	H5 supported
R^2	0.157	
Adjusted R^2	0.148	
F	17.610***	

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Table 4 Moderation hypotheses analysis.

Hypothesis	Testing paths	Unstandardized coefficient		T	Sig.	Bootstrapping	ULCI	Decision
		Standard	Error			LLCI		
H6	EA * SIM → SEI	−0.1918	0.0715	−2.6821	0.0076	−0.3324	−0.0513	Supported
H7	SN * SIM → SEI	−0.2432	0.0765	−3.1794	0.0016	−0.3934	−0.0929	Supported
H8	PBC * SIM → SEI	−0.1369	0.0494	−2.7702	0.0058	−0.2341	−0.0398	Supported
H9	EE * SIM → SEI	−0.0089	0.0683	−0.1298	0.8968	−0.1431	0.1254	Not Supported
H10	ESE * SIM → SEI	−0.1999	0.0710	−2.8160	0.0051	−0.3393	−0.0604	Supported

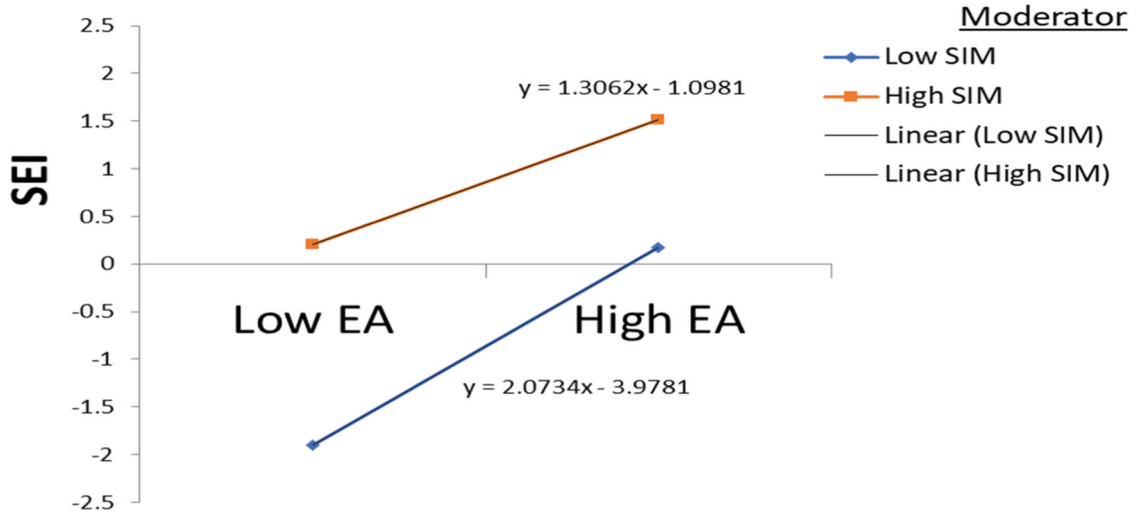

Fig. 2 Moderation effects of student internship motivation (SIM) on the relationship between college students' entrepreneurial attitudes (EA) and students' entrepreneurial intentions (SEI). Slope analysis of the moderation effects of student internship motivation (SIM) on the relationship between college students' entrepreneurial attitudes (EA) and students' entrepreneurial intentions (SEI).

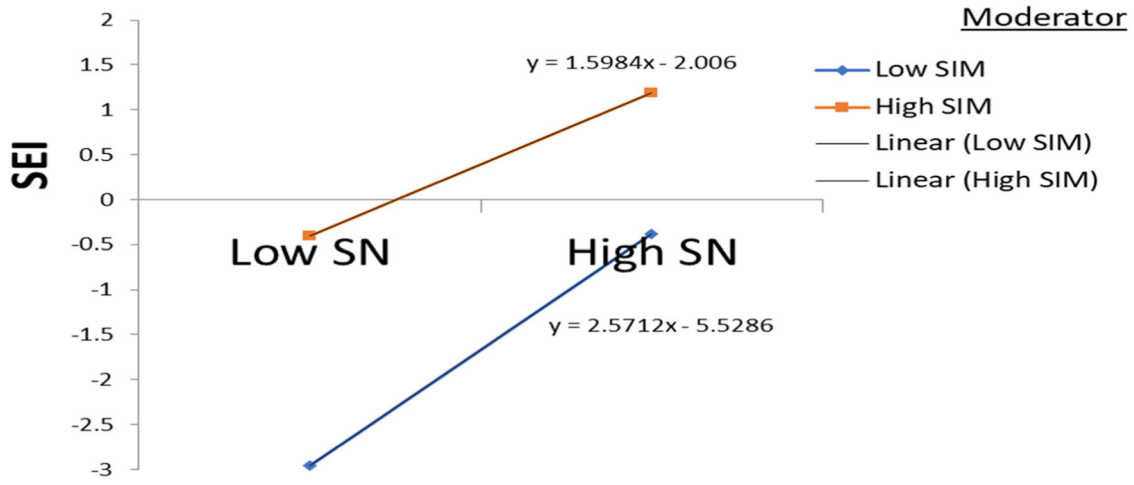

Fig. 3 Moderation effects of student internship motivation (SIM) on the relationship between college students' social norms (SN) and students' entrepreneurial intentions (SEI). Slope analysis of the moderation effects of student internship motivation (SIM) on the relationship between college students' social norms (SN) and students' entrepreneurial intentions (SEI).

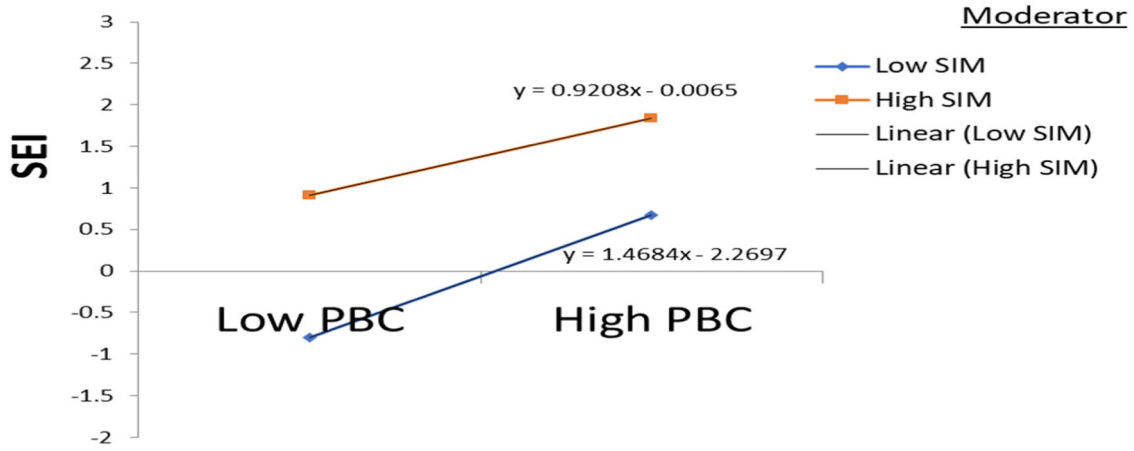

Fig. 4 Moderation effects of student internship motivation (SIM) on the relationship between college students' perceived behavior control (PBC) and students' entrepreneurial intentions (SEI). Slope analysis of the moderation effects of student internship motivation (SIM) on the relationship between college students' perceived behavior control (PBC) and students' entrepreneurial intentions (SEI).

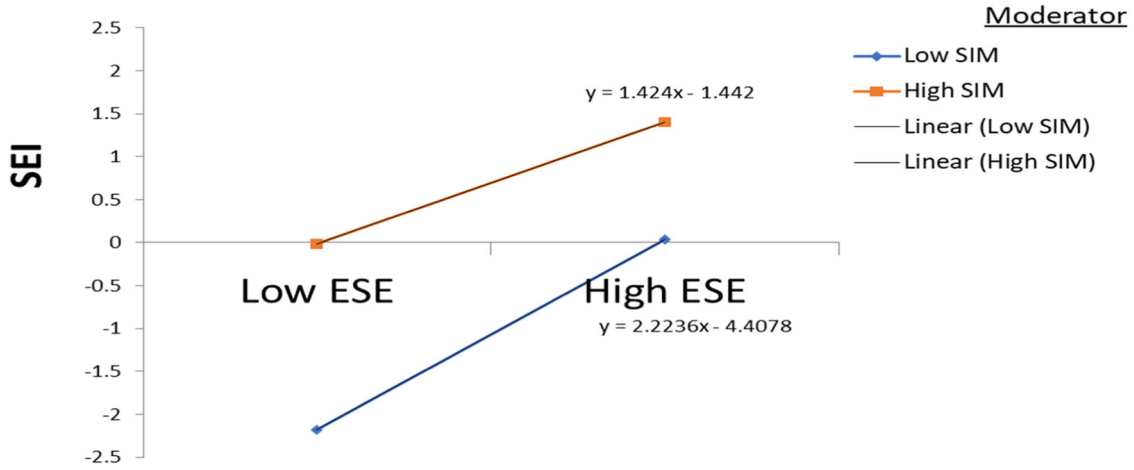

Fig. 5 Moderation effects of student internship motivation (SIM) on the relationship between college students' entrepreneurial self-efficacy (ESE) and student entrepreneurial Intention (SEI). Slope analysis of the moderation effects of student internship motivation (SIM) on the relationship between college students' entrepreneurial self-efficacy (ESE) and student entrepreneurial Intention (SEI).

create investor confidence and lasting relationships, define the core purpose of their businesses, handle unexpected difficulties, and finally cultivate the required human capitals to succeed as entrepreneurs.

Furthermore, in terms of the moderating analysis of SIM, the findings have revealed SIM is significant in strengthening the predictive power of EA, SN, PBC, and ESE on entrepreneurial intention. This means that SIM when integrated or combined with adequate EA, SN, PBC, and ESE mechanisms could have a stronger influence on student's EI. This does illustrate the power of student internship programs, if well managed and executed, can be utilized to encourage more students to take the path of entrepreneurship and to be entrepreneurs. Internship programs thus become an important vehicle to develop good entrepreneurial mindsets in students in areas such as the use of curiosity and innovation to find resourceful methods to handle difficult challenges; collaborate and work with teams effectively; and collect, analyze, and assimilate information properly. The study, however, demonstrated that SIM was not a significant moderator of the impact of EE on EI. It implies that the inclusion of SIM as the third construct between the interaction of EE and entrepreneurial intention does not add or strengthen the already established predictive influence of EE on EI. These results are unique and could not be compared with any previous literature since this is the first time that it has been empirically tested. These are the major contributions of this work to the entrepreneurship literature.

Conclusions and implications

This paper investigated the elements driving university students to take up entrepreneurial undertakings by specifically experimenting with how SIM moderates the impact of EA, SN, PBC, EE, and ESE on students' EI. The study has confirmed that student EI is driven by factors such as EA, SN, PBC, EE, and ESE. The moderating analyses (the major novelty of this study) have revealed that SIM can help contribute to the impact of EA, SN, PBC, and ESE on SEIs. However, SIM does not contribute to the impact of EE on the cultivating of students' EI. These results provide policymakers and practitioners, especially university authorities, to engage and collaborate with business sector industries to design quality student internship programs and policies that can encourage students to sign up for internship programs. This is vital since it can have an enormous impact on shaping their future entrepreneurial ambitions and becoming successful entrepreneurs.

Theoretical implications. The TPB has been utilized in many research works relating to entrepreneurial studies and thus provides a strong theoretical foundation for its application in this study. The integration of SIM in the framework of the TPB and the advancement of a model for testing provides a further theoretical basis for strengthening the theoretical fundamentals of TPB, especially in its application in entrepreneurial research. The integration has demonstrated that SIM strengthens the impact of EA, SN, PBC, and ESE on the student EI but fails to strengthen the impact of EE on EI. These empirical results, which are unique contributions of this paper and different from other studies (Tseng et al. 2022; Wang et al. 2023) that have also examined the moderating influence drivers on entrepreneurship behaviors, provide a theoretical basis for scholars to continue to authenticate our study model in connection to TPB.

Practical implications. First, the educational system should implement mechanisms that will empower students to build stronger EAs toward entrepreneurship. Attitude is everything for entrepreneurs and is the most fundamental for achieving business goals. Students should have the attitudes of a fighter, and changemakers and remain positive all the time even if things do not go as expected, which usually does not for new start-up businesses. Students should have attitudes that show perseverance, strength, and desire to accomplish business goals. Also, students can learn from experienced entrepreneurs, develop positive mindsets, have confidence in their abilities, and maintain self-discipline and dedication to their work if they are to demonstrate the EAs needed for their business motivation and development.

Second, the people around us can influence our perspective on entrepreneurship via the opinions and comments that are shared with us and with others. Since students are at their formative stage, any negative comments about becoming an entrepreneur may destroy their ambition to ever want to become an entrepreneur in the future. So the social environment in which students grow up must be devoid of any SNs or systems that may eat away their interest in entrepreneurship. Rather, university authorities, parents, family members, friends, and colleagues should share motivating stories about entrepreneurs and entrepreneurship with students, and this will ultimately heighten their curiosity in entrepreneurship and thus will be attracted to participate in entrepreneurial undertakings. Third, the university system should be a place that can develop students' PBC toward entrepreneurship through the provision of quality entrepreneurial education to students. The quality of the education system in entrepreneurial education can empower students to appreciate the easiness or difficulty that comes with the business action or start-up they seek to grow. The school system can teach students how to manage their business through good management practices in functional business areas such as accounting, financing, human resource management, and tax systems. This then serves as a foundation for building students' self-confidence and can-do attitudes toward their entrepreneurial business start-up decisions.

Fourth, SIM was demonstrated to strengthen the impact of EA, SN, PBC, and ESE on SEI, and this thus calls for university institutions to continue to devise innovative internship systems/programs for students. Internship programs complement student EAs, EE, and self-efficacy to drive EI. Internship programs allow students to get exposed to real-world settings and attain a competitive edge, especially when it comes to business start-up motivations. It also encourages them to select their chosen career path, solve problems independently, and recognize strengths and weaknesses in any endeavor. A well-executed university internship program can build student competencies and capacity in areas such as career and self-development, communication, critical thinking, leadership, professionalism, character growth/personal quality (like integrity, commitment, and self-motivation), and team and technology (including technical skills) hands-on training. All these are critical competencies that will prove useful to students as they engage in entrepreneurial activities. Consequently, University authorities are encouraged to connect with industry and business sectors to collaborate to design internship activities for students when they are on vacation. This can ensure that internship programs are executed based on some policy standards as follows: The internship program should provide an experience that ensures the application of knowledge acquired in class. The knowledge or skills acquired should be transferable to other work areas. There should be well-defined learning objectives connected to the practical agenda of the student's academic work. Supervision should be undertaken by a professional with adequate expertise and educational background. There should be adequate resources, equipment, and facilities provided by host institutions that support student intern learning goals. Students should be exposed to staff meetings, opportunities

to participate in project meetings, and other networking events during the internship. Establishments or institutions with more accreditations, like government and private sector agencies, should be given more priority to enable students to get certified in the course of the internship. Deliberations with host training companies for the chance to provide monetary incentives for services offered by interns. Coordinators for internship programs should provide a seminar to introduce students to correct workplace attitudes and behaviors prior to their placement. Implement a post-appraisal of business associates and interns.

Limitations and future research

In the elucidation and simplification of the findings of this paper, care should be exercised since the sample may not be representative, especially since it focuses on only Chinese students' perspectives. It means that the methods, research model, and approach applied in this study may be simulated in other settings (other countries), but the findings may not necessarily conform to the outcomes and inferences of this study. Also, the issues driving the entrepreneurial intention among college students are diverse and no single study can assume to cover all the factors that influence it. Hence for future research, the factors of family background and government entrepreneurship policy and its impact on moderating the effect of EA, PBC, SN, EE, and ESE on student entrepreneurial intention should be investigated.

Data availability

The data used in this study is available upon request. Due to ethical considerations and commitment made to informed consent to protect the privacy, anonymity, and confidentiality of the participants, the data cannot be made publicly accessible. Interested individuals may submit a request for access to the dataset, which will be reviewed by the researchers to ensure compliance with ethical guidelines. This approach is implemented to safeguard the rights and anonymity of the participants and maintain the integrity of the research findings. Requests can be made by contacting Muhammad Khalil Khan.

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Author contributions

IKM and DSM: conceptualization, methodology, data collection, and draft write-up. MKK: data analysis, results interpretation, and proofreading/editing. All authors contributed to the article and approved the submitted version.

Competing interests

The authors declare no competing interests.

Ethical approval

This study did not involve any humans or animals for experimental purposes and is based on a survey-based opinion. Additionally, the research follows the 1964 Helsinki Declaration and its later amendments or comparable ethical standards and has been approved by the Ethics Committee of the School of Business Administration, Fujian Jiangxia University.

Informed consent

The informed consent letter was distributed and obtained online along with questionnaires on social media systems (that is—WeChat and QQ) from the students of Jiangxi University of Science and Technology in Ganzhou City, Jiangxi Province, China, between March and April 2022.

Additional information

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