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## Factors affecting social entrepreneurship intentions among agricultural university students in Taiwan

### RESEARCH ARTICLE

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#### Abstract

Taiwan's agriculture is again generating local interest after years of decline as awareness of problems facing development and food safety grows. Agriculture-related social entrepreneurship is seen as a crucial solution to the challenges faced and has gradually become part of mainstream business in rural areas. This study examined whether empathy, social responsibility, social capital and support, and social entrepreneurial self-efficacy affect social entrepreneurial intentions. Through an online and offline survey, a sample of Taiwanese agricultural college students (n=464) were recruited for analysis. The factor analyses supported previous studies and proved that the factor structures of subscales used in this study were stable, with the exception of social entrepreneurial self-efficacy. Multiple regression analysis results indicated that management efficacy was the most prominent factor affecting social entrepreneurial conviction, followed by stakeholder perspective and communication efficacy. In addition, management efficacy was the strongest factor affecting social entrepreneurial preparation, followed by stakeholder perspective and affective empathy. Notably, cognitive empathy was revealed to be negatively associated with social entrepreneurial preparation. Social capital and support were found to have no association with social entrepreneurial intentions.

**Keywords:** empathy, entrepreneurial self-efficacy, social capital and support, social entrepreneurial intentions, social responsibility

**JEL code:** I20, I23

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## 1. Introduction

Taiwan's early agricultural industry was basic and designed primarily around grain production and the stability of rural life functions. Over time, as social and economic changes have affected the industry, the young rural population has moved to urban areas and left behind an ageing rural population, resulting in a severe labour shortage. According to the 2016 Agricultural Statistics Yearbook (Council of Agriculture, 2016), from 1976 to 1996 the agricultural population in Taiwan declined from 5.76 to 3.72, and then to 2.69 million by 2015. The area of patchy arable land, which is the result of a small-scale farming system, has also contributed to the inefficiency of agribusiness. In 1981, agricultural production accounted for 7.8% of Taiwan's GDP, whereas by 2015, it accounted for only 1.7% of GDP. In addition, Taiwan has produced approximately 10,000 graduates from agricultural colleges per year since 1984; however, increasing numbers of graduates do not choose agriculture as a career.

To attract youth to farming careers in rural areas requires first clarifying why they leave. Nugin (2014) indicated that young people rationalise leaving rural areas by contemporary narratives of self-empowerment, meaning that leaving is depicted as moving 'forward' rather than 'away.' This implies that rural areas lack resources for them to self-empower, and there is a need to create various attractions in rural areas for moving 'inward.' Agricultural multifunctionality provides potential niches that require resources to fill. In addition to food production, agricultural multifunctionality fosters the socioeconomic viability of rural areas, shaping the landscape and affording environmental benefits. One essential feature of multifunctional agriculture is the demand for entrepreneurship to address how agribusinesses, particularly agri-food-related social enterprises, can respond to rural development (Liang *et al.*, 2017). Consequently, agricultural social enterprises will gradually form into mainstream businesses in rural areas (Luhmann and Theuvsen, 2016).

Mair and Noboa (2006) proposed a theoretical model of social entrepreneurial intentions (SEIs). Scholars have empirically tested this model and suggested extending the variable 'social support' to 'social capital and support' and substituting the variable 'moral judgement' for 'social responsibility' (Ip *et al.*, 2018; Liang *et al.*, in press). Furthermore, relevant research has found that demographic variables would affect SEIs (Matlay, 2008; Wilson *et al.*, 2007). In addition, previous studies have confirmed the positive role of universities in developing entrepreneurial intention and generating entrepreneurial behaviour in students (Movahedi and Charkhtabian, 2013). However, few empirical studies have examined the entrepreneurial propensity of agricultural college students as a source of future agri-food related social entrepreneurs.

With changes in social and economic patterns, young people in Taiwan are gradually gaining a renewed interest in the agricultural sector following its years of decline. Moreover, the study of agriculture in higher education should become vital for guiding young entrepreneurs towards reaching their objectives in social innovation (Liang *et al.*, 2017). Therefore, the present study first investigated the factor structures of the suggested determinants of SEIs among agricultural students at a leading university in Taiwan. Second, it analysed the associations between demographic variables and SEIs, and how these factors affect students' SEIs.

## 2. Literature review

### 2.1 Social entrepreneurial intentions

The main motivation for any commercial enterprise is usually to obtain profit; however, social impact is the ultimate goal for social enterprises (Mair and Marti, 2006). Social entrepreneurs play an intermediary role in bringing change to the social sphere, and they assume a mission of creating and perpetuating social values (Liang *et al.*, 2017; Nga and Shamuganathan, 2010). Typically, an individual identifies a need or problem within a community, and then becomes a social entrepreneur by starting and developing a social enterprise (Dacin *et al.*, 2010). Therefore, social entrepreneurship aims to help society and create social as well as economic value.

Entrepreneurial intention can be described as ‘a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future’ (Thompson, 2009:676). Regarding student entrepreneurship, scholars applied the theory of planned behaviour factors identified by Ajzen (1991) to demonstrate that entrepreneurial intentions of students are shaped by their attitude towards entrepreneurial behaviour (Van Gelderen *et al.*, 2008). In addition, Wang *et al.* (2014) summarised the results of research conducted by Liñán and Chen (2009) and Lans *et al.* (2010), who found that the entrepreneurial intention scale should consist of two dimensions, conviction and preparation.

SEIs can be described as an individual’s behavioural intention to launch a social enterprise in order to advance social change and solve social problems by using resources and social identity, thereby achieving a sustainable social development process (Alvord *et al.*, 2004). Thus, those with SEIs have a desire to create social change as a primary motivation (Austin *et al.*, 2006). Ayob *et al.* (2013) noted that students with SEIs are more likely to be social entrepreneurs or are more suitable for work in companies with corporate responsibility and for participating in social enterprises that influence communities.

## 2.2 Antecedents of social entrepreneurial intentions

Based on the theory of planned behaviour by Ajzen (1991), Mair and Noboa (2006) proposed an SEI model, and suggested that empathy, moral judgement, social entrepreneurial self-efficacy, and perceived social support are factors that affect SEIs. However, moral judgement is personal and difficult to link within a business context; therefore, scholars have suggested that it should be substituted with social responsibility (Ip *et al.*, 2018; Liang *et al.*, in press). In addition, social capital strongly affects the career choices and entrepreneurial intentions of young people, and is a critical base for individual social support (Liñán and Santos, 2007; Sharma, 2014). Thus, the current study accounted for social capital and support. In summary, the present study investigated how empathy, social responsibility, social entrepreneurial self-efficacy, and social capital and support affect the SEIs of agricultural university students in Taiwan. Moreover, the associations between demographic variables and SEIs were analysed.

Empathy has been defined as the ‘natural ability to understand the emotions and feelings of others, whether one actually witnessed his or her situation, perceived it from a photograph, read about it in a fiction book, or merely imagined it’ (Decety and Jackson, 2004:71). Wood (2012) noted that empathy is a key driver for supporting social ventures and drives social innovation. Empathy shapes the role of social entrepreneurship when individuals are motivated to assume responsibility and demonstrate virtuous behaviour (Grimes *et al.*, 2013; Kraus *et al.*, 2014). Additionally, several studies have determined that empathy is closely related to individual SEIs (Forster and Grichnik, 2013; Hockerts, 2017; Urban and Teise, 2015).

One of the most common definitions of social responsibility states ‘[it] encompasses the economic, legal, ethical, and discretionary expectations that society has of organisations at a given point in time’ (Carroll, 1979:500). Singhapakdi *et al.* (1995) developed the Perceived Role of Ethics and Social Responsibility (PRESOR) scale. The PRESOR scale has been widely used to examine individuals, contextual variables, and their relationships with business ethics (Ang and Leong, 2000; Axinn *et al.*, 2004; Elias, 2004; Wurthmann, 2013). PRESOR’s results vary depending on background variables, such as cultural environment, industrial environment, organisational environment, and personal characteristics.

Social capital refers to the scale of an available social network and the aggregate quality of resources owned by all members in the social network (Bourdieu, 1986). Strong social capital and support assist entrepreneurs in establishing new ventures (Liñán and Santos, 2007; Tatarko and Schmidt, 2016). Social capital and support benefit entrepreneurial activity, especially in opportunity identification, network connection, financial improvement, enterprise reputation, community sustainability, and economic development (Kay, 2006; Kibler *et al.*, 2014; Lechner and Dowling, 2003; Newman and Dale, 2005). Social capital networks affect students’ career intentions, particularly their willingness to become an entrepreneur (Sharma, 2014).

Social entrepreneurial self-efficacy is described as ‘a person’s belief that individuals can contribute towards solving societal problems’ (Hockerts, 2017:109). Entrepreneurial self-efficacy has the most notable and positive impact on intention to become an entrepreneur and serves as a predictor for social entrepreneurial behaviour (Fitzsimmons and Douglas, 2011; Forster and Grichnik, 2013; McGee *et al.*, 2009; Tyszka *et al.*, 2011; Urban, 2013). Those with higher self-efficacy are more likely to locate entrepreneurial opportunities (Shane *et al.*, 2003; Vecchio, 2003). Zellweger *et al.* (2011) indicated that students with a family business background tend to be optimistic about their ability to pursue an entrepreneurial career.

Studies have found that demographic variables affect SEIs. For example, Wilson *et al.* (2007) indicated that the entrepreneurial intentions of women are generally lower than those of men. The results of Abd Moen *et al.* (2004) and Liu *et al.* (2017) revealed that age did not exert a considerable influence on entrepreneurial intentions. However, several scholars have noted that an individual’s college major affects career choices and entrepreneurial intentions (Abd Moen *et al.*, 2004; Matlay, 2008). Therefore, demographic variables were selected as factors to be examined regarding their impact on SEIs.

In summary, the aforementioned studies have suggested and validated the effects of demographics, empathy, social responsibility, social entrepreneurial self-efficacy, and social capital and support on SEIs. However, insufficient research has been devoted to discussing how demographics and antecedents influence young people’s entrepreneurial intentions to create agriculture-related social enterprises, particularly among agriculture graduates.

### 3. Method

#### 3.1 Participants

To explore the entrepreneurial intention involved in the creation of agriculture-related social enterprises, we collected relevant information through online and offline questionnaires. The research subjects were students from the College of Bio-Resources and Agriculture at National Taiwan University (NTU), founded in 1943. The academic programmes at this college form three major categories, namely natural sciences (agronomy, plant pathology, horticulture, agricultural chemistry, entomology, animal science, and forestry), engineering (bioenvironmental systems engineering and bioindustrial mechatronics engineering), and humanities and social sciences (agricultural economics, and bioindustry communication and development). This college plays a leading role in promoting sustainable agricultural development in Taiwan and Asia.

The present study involved third and fourth year undergraduate NTU students as well as postgraduate students. According to 2016 NTU statistics, 2,706 students (excluding first and second year undergraduates) were enrolled in the college. To avoid bias, a random sampling design was adopted. A list of research subjects was obtained from the college office, and each subject was assigned a sequential number. For a 95% confidence level with a 5% margin of error, at least 337 questionnaires were required. We used a random number generator to select the sample, and then invited the participants to complete the survey.

#### 3.2 Instrumentation

Several scale items from previous research were adopted in this study to ensure that measurements were reliable and valid. The respondents answered on a 6-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree). Unanswered questions were set as missing values.

From Reniers *et al.* (2011) and Hockerts (2017), 12 questions pertaining to dimensions of cognitive and affective empathy were used (6 items for each dimension). With reference to Singhapakdi *et al.* (1995), 10 questions with high factor loadings for social responsibility were adopted, with five items each for dimensions of stakeholder and stockholder perspectives.

From Williams's (2006) model of bridging and bonding social capital and Hockerts's (2017) measure of social support, 10 questions (five questions each for dimensions of bridging and bonding social capital and support) were used. In addition, 15 questions from McGee *et al.* (2009) on entrepreneurial self-efficacy, with three dimensions of planning, communicating, and management, were adapted for this study (five questions for each dimension). Finally, SEIs were measured using conviction and preparation dimensions with 10 questions (five items for each dimension) developed by Ip *et al.* (2017) and Liu *et al.* (2017).

### 3.3 Procedures

The survey was conducted during October and November 2017 using both online and offline channels. First, we posted the survey link on Facebook fan pages for university students attending NTU, as well as the NTU page of the PTT bulletin board system (a popular messaging board in Taiwan). We further distributed the survey during agriculture-related classes at NTU. Participation was voluntary, and anonymity was guaranteed. In total, 494 questionnaires were received through both channels.

Based on the basic information provided by respondents, the percentage and distribution of descriptive statistics was representative of the student population. Students' demographic variables were used for factor analysis using varimax rotation to test the dimensionality of the concepts. Subsequently, *t*-tests, analysis of variance (ANOVA), and multiple regression analysis were used to analyse causal relationships among the variables. Analyses were made using SPSS (version 21.0, IBM Corporation, Armonk, NY, USA).

## 4. Results

### 4.1 Descriptive statistics

Of the 494 retrieved questionnaires, 30 contained incomplete or unusable responses and were therefore considered invalid. Table 1 outlines descriptive statistics regarding the demographic characteristics of the participants.

### 4.2 Exploratory factor analysis

Regarding empathy, the Kaiser-Meyer-Olkin (KMO) value was 0.79. The results of Bartlett's test of sphericity were significant ( $\chi^2=2,448.043$ ,  $df=66$ ,  $P<0.001$ ), suggesting that the data were suitable for factor analysis.

**Table 1.** Descriptive statistics (n=464).

Demographic variables		Percentage
Gender	Male	48.1%
	Female	51.9%
Grade	Third year	42.5%
	Fourth year	23.9%
	Master	30.2%
	Doctorate	3.4%
Age	20 or below	36.5%
	21-22	33.9%
	23-24	17.9%
	25 or above	11.5%
Department	Natural sciences	23.9%
	Humanities and social sciences	49.9%
	Engineering and technology	22.7%

The total variance explained of the two factors – cognitive and affective empathy – was 53.64%, which indicated adequate validity (Supplementary Table S1).

For social responsibility, the KMO value was 0.85. Bartlett's test of sphericity was significant ( $\chi^2=1,827.148$ ,  $df=45$ ,  $P<0.001$ ). The total variance explained of the two factors – stakeholder and stockholder perspectives – was 61.03%, which indicated adequate validity. For social capital and support, the KMO value was 0.81. Bartlett's test of sphericity was significant ( $\chi^2=2,912.437$ ,  $df=45$ ,  $P<0.001$ ). The total variance explained of the two factors – bonding and bridging social capital and support – was 68.10%, which indicated adequate validity. For social entrepreneurial self-efficacy, the KMO value was 0.89. Bartlett's test of sphericity was significant ( $\chi^2=4,094.30$ ,  $df=105$ ,  $P<0.001$ ). The total variance explained of the two factors – management and communication – was 60.19%, which indicated adequate validity. The KMO value of SEIs was 0.92. Bartlett's test of sphericity was significant ( $\chi^2=3,617.563$ ,  $df=45$ ,  $P<0.001$ ). The total variance explained of the two factors – conviction and preparation – was 73.50%, which indicated adequate validity.

The results of exploratory factor analysis revealed that empathy can be divided into two dimensions: cognitive and affective empathy. Social responsibility can be divided into stakeholder and stockholder perspectives. Social capital and support can be divided into bonding and bridging capital. In addition, social entrepreneurial self-efficacy can be divided into management and communication efficacy. Finally, SEIs can be divided into conviction and preparation. Overall, the results are consistent with the literature cited in this study, except for the items related to self-efficacy, proving that the factor structures of subscales were stable.

The division of social entrepreneurial self-efficacy into the two dimensions of management and communication differs from the division into three dimensions of planning, communication, and management suggested by McGee *et al.* (2009). This result likely occurred because of limitations inherent to the research sample, which consisted of students who may have lacked work experience. As such, they may have considered planning and management to be part of the same category.

#### 4.3 Independent samples *t*-test and ANOVA

This study explored the SEIs of Taiwanese agricultural college students at NTU and adopted the independent samples *t*-test to analyse differences. According to a gender analysis (Table 2), in social entrepreneurial preparation, the means of male students ( $M=3.211$ ,  $SD=1.086$ ) were significantly higher ( $P<0.05$ ) than those of female students ( $M=2.993$ ,  $SD=1.010$ ). However, differences in the conviction aspect did not reach a significant level.

One-way ANOVA was performed at a 95% confidence interval to confirm whether statistically significant differences existed among various age segments in the SEIs. As Table 3 shows, differences in both social entrepreneurial conviction and preparation reached significant levels ( $P<0.001$ ). The means of the respondents in the 21-22 years age range were significantly lower ( $P<0.05$ ) than those of respondents in other age ranges. Differences in other demographic variables, such as students' academic major and achievements, did not reach a level of significance.

**Table 2.** Independent *t*-test of gender differences in variables ( $n=464$ ).<sup>1</sup>

Variables	Male (n=223)		Female (n=241)		<i>t</i>	<i>P</i> -value	df
	Mean	SD	Mean	SD			
Social entrepreneurial intentions							
Conviction	3.354	1.111	3.190	1.078	1.615	0.107	462
Preparation	3.211	1.086	2.993	1.010	2.243	0.025	462

<sup>1</sup> \*  $P<0.05$ , \*\*  $P<0.01$ , \*\*\*  $P<0.001$ ; SD = standard deviation; df = degrees of freedom.

**Table 3.** ANOVA of differences in variables according to age ranges (n=464).<sup>1</sup>

SEIs	Age≤20 (a) (n=169)		Age 21-22 (b) (n=157)		Age 23-24 (c) (n=83)		Age≥25 (d) (n=55)		F-value	P-value	df	Post hoc
	Mean	SD	Mean	SD	Mean	SD	Mean	SD				
	Conviction	3.421	1.049	2.916	1.046	3.453	1.118	3.531				
Preparation	3.204	1.017	2.833	1.017	3.260	1.020	3.280	1.271	5.235	0.001	463	a, c, d > b

<sup>1</sup> \*  $P<0.05$ , \*\*  $P<0.01$ , \*\*\*  $P<0.001$ ; SEIs = social entrepreneurial intentions; SD = standard deviation; df = degrees of freedom.

#### 4.4 Multiple regression analysis

The standardised regression coefficients for the effects of management, stakeholder perspective, and communication on social entrepreneurial conviction reached 0.436 ( $P<0.001$ ), 0.245 ( $P<0.001$ ), and 0.121 ( $P<0.01$ ), respectively (Table 4). Moreover, cognitive empathy negatively affected social entrepreneurial preparation (-0.096), whereas the standardised regression coefficients for the effects of management, stakeholder perspective, and affective empathy on social entrepreneurial preparation reached 0.495 ( $P<0.05$ ), 0.171 ( $P<0.001$ ), and 0.098 ( $P<0.001$ ), respectively. The  $R^2$  for the correlation of independent variables to social entrepreneurial conviction and preparation reached 33.9 and 32.5%, respectively. The results of the  $F$  test reached a significant level ( $P<0.001$ ), indicating that the regression model was appropriate.

## 5. Discussion

We conducted an independent samples  $t$ -test based on gender to analyse the demographic variables of SEIs. The results demonstrated a higher mean for male students than for female students regarding entrepreneurial intentions. This result may be related to the prevalence of patriarchal traditions in Taiwanese society, because men may feel more responsibility towards providing for their family, and women may possess more behavioural and moral etiquette that limits their willingness to engage in entrepreneurial endeavours (Chen, 2009). Studies have also indicated that men are more likely to think about creating a business than women are (Díaz-García and Jiménez-Moreno, 2010).

Students aged 25 years or older demonstrated the highest average, and those aged 21-22 years had the lowest average. Students aged 21-22 years must usually choose between entering the workplace and continuing

**Table 4.** Multiple regression analysis on social entrepreneurial intentions (SEIs) (n=464).<sup>1</sup>

Variables	SEIs	SEIs					
		Conviction			Preparation		
		Beta	$t$	$P$ -value	Beta	$t$	$P$ -value
	(Constant)		-3.599	0.000		-2.116	0.035
Empathy	Cognitive	-0.025	-0.58	0.562	-0.096*	-2.167	0.031
	Affective	0.075	1.866	0.063	0.098*	2.413	0.016
Social responsibility	Stakeholder	0.245***	5.832	0.000	0.171***	4.023	0.000
	Stockholder	0.048	1.17	0.242	0.071	1.738	0.083
Social capital and support	Bonding	0.029	0.687	0.492	0.080	1.893	0.059
	Bridge	-0.038	-0.892	0.373	-0.069	-1.603	0.110
Social entrepreneurial self-efficacy	Management	0.436***	9.769	0.000	0.495***	10.955	0.000
	Communication	0.121**	3.043	0.002	0.050	1.255	0.210
	$R^2$	0.339			0.325		
	$F$	29.129***			27.336***		

<sup>1</sup> \*  $P<0.05$ , \*\*  $P<0.01$ , \*\*\*  $P<0.001$ .



their studies; therefore, their emotions tend to be less stable during this period. The results indicated that as students mature professionally and cognitively at a senior level, they may become more cautious regarding their career based on the employment market. As Taiwan's agricultural sector has become associated with environmental sustainability and entrepreneurship, more young graduates are willing to pay attention to and participate in agriculture-related social entrepreneurship activities. It is crucial for governments to systematically create a set of encouraging policies and empowering programmes for these people, in which they can exchange business ideas, gain necessary resources, and collaborate to strengthen their SEIs and subsequent entrepreneurial actions.

The present study adopted multiple regression analysis to examine the impacts of empathy, social responsibility, entrepreneurial self-efficacy, and social capital and support on the entrepreneurial intentions of social enterprises. The results demonstrated that the overall model reached a significant level. The factor with the strongest positive effect on social entrepreneurial conviction was determined to be management efficacy, followed by stakeholder perspective and communication efficacy. In addition, the factor with the strongest positive effect on social entrepreneurial preparation was management efficacy, followed by stakeholder perspective and affective empathy, whereas cognitive empathy negatively affected social entrepreneurial preparation. Agricultural colleges should design appropriate programmes combining classroom-based education with practical work experience for students who want to create social enterprises. According to our results, when improving the social entrepreneurial system for young people, special attention should be paid to entrepreneurial self-efficacy and long-term social benefits.

Social entrepreneurial self-efficacy was significantly associated with SEIs, which supported the results of relevant studies (Forster and Grichnik, 2013; Mair and Noboa, 2006; Wang and Liang, 2015). Hockerts (2017) found that social entrepreneurial self-efficacy was a dominant predictor of SEIs in two student samples. Regarding the two dimensions of entrepreneurial self-efficacy, management efficacy had a positive association with entrepreneurial conviction and entrepreneurial preparation, but communication efficacy was only significantly associated with entrepreneurial preparation. The results imply that agriculture educators should encourage students and assist them in building their entrepreneurial self-efficacy (management and communication), and provide positive experiences for engaging in social entrepreneurial activities. Educators should also embed career flexibility (to develop self-efficacy) into their coursework design and placement experience planning. Furthermore, management practitioners should use valid and practical tools to measure job seekers' entrepreneurial self-efficacy and solid competence.

Stakeholder perspective and an emphasis on long-term social benefits are vital to the concept of individual social responsibility (Singhapakdi *et al.*, 1995). The findings of the present study correspond with those of Ernst (2011), who argued that social responsibility is a characteristic of social entrepreneurship. The results indicated that the stakeholder perspective of social responsibility has a significant effect on both aspects of entrepreneurial intentions; in particular, stakeholder perspective has a stronger influence on social entrepreneurial conviction than on social entrepreneurial preparation, which is consistent with other research (e.g. Ip *et al.*, 2018). These results suggest that talent development programmes in universities and on-the-job training programmes in the business world should incorporate young people's beliefs about environmental sustainability, as well as encourage them to develop unique ideas for and approaches to niche agri-food markets. Through the adjustment of related in-depth content, a well-designed curriculum and activities can enhance the effectiveness of agricultural social entrepreneurship, which will have long-term benefits for Taiwan's global agricultural standing.

The present study determined empathy to be a significant factor contributing to SEIs, which is in agreement with Hockerts (2017). Regarding affective empathy for social entrepreneurial preparation, most students who wanted to be social entrepreneurs in farming were emotionally positive about agriculture and tending the land. Notably, cognitive empathy was determined to have a negative effect on social entrepreneurship preparation, which was contrary to relevant studies (Forster and Grichnik, 2013; Hockerts, 2017; Urban and Teise, 2015). A possible explanation is that students may fulfil their social responsibility through other

channels, such as donations and voluntary engagements, rather than adhering to social enterprises. These results suggest that agricultural scholars and management practitioners should lead young people to engage personally and emotionally in agricultural social entrepreneurial activities to enhance their SEIs and possible actions. Designing experience-based courses could promote students' willingness to participate in social enterprises. Recognising the value of profit-making strategies for the achievement of social innovation and sustainable development is necessary.

Although several studies have demonstrated that social capital has a significant impact on entrepreneurial intentions (Liang *et al.*, in press; Liñán and Santos, 2007; Sharma, 2014), our results indicated that social capital and support were non-significantly associated with SEI. These results may be explained by a lack of realistic business experience causing young people to neglect the importance of social capital and support in social entrepreneurial actions. However, this also implies that social entrepreneurship counselling programmes may be required to provide necessary resources regarding creative operations of commercial means and potential entrepreneurial partners. That is, experience-based learning activities should be developed and delivered through the provision of various types of social capital and support, thereby allowing students to understand the importance of social supports and their possible applications.

This study had three limitations. First, the sample was taken from agricultural college students at NTU and cannot be generalised to students from other programmes. Second, the questionnaires were distributed at NTU, which may not be representative of the overall student population of universities in Taiwan. Finally, the opinions of agricultural entrepreneurs were not considered in this study; that is, the influence of real-world experience on student attitudes was not examined.

In light of these limitations, future studies could further address this topic. First, interdepartmental or intercollege research could be conducted. Second, the present study could be extended through cross-regional research comparing Taiwan, China, and Hong Kong. Third, in addition to the variables considered in the current study, future studies could examine personality traits, entrepreneurial creativity, and prior experience with social problems, thereby enhancing the understanding of SEIs.

## 6. Conclusions

The results of this study enrich the theoretical foundations of social entrepreneurship and clarify the effects of empathy, social responsibility, social capital and support, and entrepreneurial self-efficacy on SEIs. We demonstrated that management efficacy, stakeholder perspective, and communication efficacy were positively associated with social entrepreneurial conviction, whereas management efficacy, stakeholder perspective, and affective empathy were positively associated with social entrepreneurial preparation. Notably, cognitive empathy was negatively associated with social entrepreneurial preparation. Moreover, the means of the male students were higher than those of the female students, and students aged 21-22 had the lowest average mean among the three age groups. College students often have high levels of empathy, strong social responsibility, and high self-efficacy, which are all traits that affect the development of agricultural social enterprises.

This research provides several contributions to the literature. First, we identified and evaluated factors that affect the SEIs of agricultural college students, which have rarely been studied. We developed a novel research approach and discussed the practical implications of our findings. Second, enhancing student interest in choosing a career in agricultural practice is among the primary goals of agricultural educators, and our results provide educators in agricultural colleges with an understanding of their students' agri-food related SEIs. Third, this study elucidated alternative approaches for selecting students, promoting student interests, and enabling academic success when studying agriculture. Finally, entrepreneurship is crucial because it facilitates economic efficiency, innovative product and service development, and new employment opportunities. This study offers reference information for human resource managers in agricultural enterprises, which can facilitate their social entrepreneurial innovations.

The results of this study provide a foundation for further investigating the association between innate characteristics and agricultural careers; the linkage among student selection, coursework design, internship arrangement, and placement development; and the connection among employee recruitment, development, retention, promotion, and achievement. Collectively, the findings contribute to the continuing discussion on innovative developments in agricultural education and rural sustainability.

## Supplementary material

Supplementary material can be found online at <https://doi.org/10.22434/IFAMR2018.0032>.

**Table S1.** Results of exploratory factor analysis (n=464).

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