Factors affecting social entrepreneurship intentions among agricultural university students in Taiwan

RESEARCH ARTICLE

Teng-Li Yu\textsuperscript{a} and Jiun-Hao Wang\textsuperscript{b}

\textsuperscript{a}Doctoral Student and \textsuperscript{b}Associate Professor, Department of Bio-Industry Communication and Development, National Taiwan University, No 1 Roosevelt Rd, Sec 4, Taipei 10617, Taiwan

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

\textsuperscript{\Phi}Corresponding author: wangjh@ntu.edu.tw
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 Gricnik, 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 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).1

| Variables                   | Male (n=223) | Female (n=241) | t     | P-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 |

1** $P<0.05$, *** $P<0.01$, **** $P<0.001$; 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 3. ANOVA of differences in variables according to age ranges (n=464).

| Variables | 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 |
|-----------|-------------------|-----------------------|---------------------|-------------------|---------|---------|----|---------|
| Conviction| Mean SD            | Mean SD               | Mean SD             | Mean SD           | Mean SD | Mean SD |     |         |
| Preparation| Mean SD            | Mean SD               | Mean SD             | Mean SD           | Mean SD | Mean SD |     |         |
| Empathy | Cognitive          | Affective             |                      |                   |         |         |     |         |
| Social responsibility | Stakeholder | Stockholder          |                      |                   |         |         |     |         |
| Social capital and support | Bonding | Bridge               |                      |                   |         |         |     |         |
| Social entrepreneurial self-efficacy | Management | Communication |                      |                   |         |         |     |         |

| **Values** | **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   |
| Social responsibility | Stakeholder | 0.245*** | 5.832          | 0.000   |
| Social capital and support | Bonding | 0.029          | 0.687           | 0.492   |
| Social entrepreneurial self-efficacy | Management | 0.436*** | 9.769          | 0.000   |

| **Values** | **SEIs** | **Conviction** | **Preparation** |
|------------|----------|---------------|-----------------|
| Beta       | $t$      | $P$-value     | Beta            | $t$      | $P$-value  |
| R²         | 0.339    |               | 0.325           |         |
| F          | 29.129*** |               | 27.336***      |         |

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

References

Abd Moen, J., I. Abd Rahman, M.F. Md Salleh and R. Ibrahim. 2004. A study on entrepreneurial attitudes among youths in Malaysia. Case study: Institute Kemahiran Belia Negara Malaysia. *Journal of American Academy of Business* 4(1/2): 192-197.

Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50(2): 179-211.

Alvord, S.H., L.D. Brown and C.W. Letts. 2004. Social entrepreneurship and societal transformation. *Journal of Applied Behavioral Science* 40(3): 260-282.

Ang, S.H and S.N. Leong. 2000. Out of the mouths of babes: business ethics and youths in Asia. *Journal of Business Ethics* 28(2): 129-144.

Austin, J.E., H. Stevenson and J. Wei-Skillem. 2006. Social and commercial entrepreneurship: same, different, or both? *Entrepreneurship Theory and Practice* 30: 1-22.

Axinn, C.N., M.E. Blair, A. Heorhiadi and S.V. Thach. 2004. Comparing ethical ideologies across cultures. *Journal of Business Ethics* 54(2): 103-119.

Ayob, N., C.S. Yap, D.A. Sapuan and M.Z.A. Rashid. 2013. Social entrepreneurial intention among business undergraduates: an emerging economy perspective. *Gadjah Mada International Journal of Business* 15(3): 249-267.

Bourdieu, P. 1986. The forms of capital. In: *Handbook of theory and research for the sociology of education*, edited by J.G. Richardson. Greenwood Press, New York, NY, USA, pp. 241-258.

Carroll, A.B. 1979. A three-dimensional conceptual model of corporate performance. *Academy of Management Review* 4(4): 497-505.

Chen, Y.-C. 2009. The struggles of Taiwanese feminism. In: *Women in Taiwan: sociocultural perspectives*, edited by Y.-C. Chen. The University of Indianapolis Press, Indianapolis, IN, USA, pp. 3-14.

Council of Agriculture. 2016. *Agricultural Statistics Yearbook*. Available at: http://ap.fhtc.org.tw/ap_situationer.php?id=20171122135749.

Dacin, P.A., M.T. Dacin and M. Matear. 2010. Social entrepreneurship: why we don’t need a new theory and how we move forward from here. *Academy of Management Perspectives* 24(3): 37-57.

Decety, J. and P.L. Jackson. 2004. The functional architecture of human empathy. *Behavioral and Cognitive Neuroscience Reviews* 3(2): 71-100.

Díaz-García, M.C. and J. Jiménez-Moreno. 2010. Entrepreneurial intention: the role of gender. *International Entrepreneurship Management Journal* 6: 261-283.

Elias, R.Z. 2004. An examination of business students’ perception of corporate social responsibilities before and after bankruptcies. *Journal of Business Ethics* 52(3): 267-281.

Ernst, K.K. 2011. *Heart over mind: an empirical analysis of social entrepreneurial intention formation on the basis of the theory of planned behavior*. Doctoral dissertation of Schumpeter School of Business and Economics. University of Wuppertal – Bergische Universität Wuppertal, Wuppertal, North Rhine-Westphalia, Germany.

Fitzsimmons, J.R. and E.J. Douglas. 2011. Interaction between feasibility and desirability in the formation of entrepreneurial intentions. *Journal of Business Venturing* 26(4): 431-440.
Forster, F. and D. Grichnik. 2013. Social entrepreneurial intention formation of corporate volunteers. *Journal of Social Entrepreneurship* 4(2): 153-181.

Grimes, M.G., J.S. McMullen, T.J. Vogus and T.L. Miller. 2013. Studying the origins of social entrepreneurship: compassion and the role of embedded agency. *Academy of Management Review* 38(3): 460-463.

Hockerts, K. 2017. Determinants of social entrepreneurial intentions. *Entrepreneurship Theory and Practice* 41(1): 105-130.

Ip, C.Y., C. Liang, S.-C. Wu, K.M.Y. Law and H.-C. Liu. 2018. Enhancing social entrepreneurial intentions through entrepreneurial creativity: a comparative study between Taiwan and Hong Kong. *Creativity Research Journal* 30(2): 132-142.

Ip, C.Y., S.-C. Wu, H.-C. Liu and C. Liang. 2017. Revisiting the antecedents of social entrepreneurial intentions in Hong Kong. *International Journal of Educational Psychology* 6(3): 301-323.

Kay, A. 2006. Social capital, the social economy and community development. *Community Development Journal* 41(2): 160-173.

Kibler, E., T. Kautonen and M. Fink. 2014. Regional social legitimacy of entrepreneurship: Implications for entrepreneurial intention and start-up behavior. *Regional Studies* 48(6): 995-1015.

Kraus, S., M. Filser, M. O’Dwyer and E. Shaw. 2014. Social entrepreneurship: an exploratory citation analysis. *Review of Managerial Science* 8(2): 275-292.

Lans, T., J. Gulikers and M. Batterink. 2010. Moving beyond traditional measures of entrepreneurial intentions in a study among life-sciences’ students in the Netherlands. *Research in Post-Compulsory Education* 15(3): 259-274.

Lechner, C. and M. Dowling. 2003. Firm networks: external relationships as sources for the growth and competitiveness of entrepreneurial firms. *Entrepreneurship and Regional Development* 15(1): 1-26.

Liang, C., C.-C. Chang, C.-T. Liang and Y.-C. Liu. 2017. Imagining future success: Imaginative capacity on the perceived performance of potential agrisocio entrepreneurs. *Thinking Skills and Creativity* 23: 161-174.

Liang, C., C.Y. Ip, S.-C. Wu, K.M. Law, J.-H. Wang, L.-P. Peng and H.-C. Liu. In press. Personality traits, social capital, and entrepreneurial creativity: comparing green socioentrepreneurial intentions across Taiwan and Hong Kong. *Studies in Higher Education*. DOI: https://doi.org/10.1080/03075079.2017.1418310.

Liñán, F. and Y. Chen. 2009. Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice* 33(3): 593-617.

Liñán, F. and F.J. Santos. 2007. Does social capital affect entrepreneurial intentions? *International Advances in Economic Research* 13(4): 443-453.

Liu, H.-C., C.Y. Ip and C. Liang. 2017. Demographic analysis for the social entrepreneurial intentions of media workers. Paper presented at the 2017 International Conference on Business and Information (BAI2017), International Business Academics Consortium, Hiroshima, Japan. Available at: http://tinyurl.com/y8q2ybhz.

Luhmann, H. and L. Theuvsen. 2016. Corporate social responsibility in agribusiness: literature review and future research directions. *Journal of Agricultural and Environmental Ethics* 29: 673-696.

Mair, J. and E. Noboa. 2006. Social entrepreneurship: how intentions to create a social venture are formed. In: *Social entrepreneurship*, edited by J. Mair, J. Robinson and K.N. Hockerts. Palgrave MacMillan, Basingstockholder, UK., pp. 121-135.

Mair, J. and I. Marti. 2006. Social entrepreneurship research: a source of explanation, prediction, and delight. *Journal of World Business* 41(1): 36-44.

Matlay, H. 2008. The impact of entrepreneurship education on entrepreneurial outcomes. *Journal of Small Business and Enterprise Development* 15(2): 382-396.

McGee, J.E., M. Peterson, S.L. Mueller and J.M. Sequeira. 2009. Entrepreneurial self-efficacy: Refining the measure. *Entrepreneurship Theory and Practice* 33: 965-988.

Movahedi, R. and T. Charkhtabian. 2013. Identifying entrepreneurship abilities in agricultural extension and education specialized credits. *International Journal of Agriculture and Crop Sciences* 5(23): 2845-2851.
Newman, L. and A. Dale. 2005. The role of agency in sustainable local community development. *Local Environment* 10(5): 477-486.

Nga, J.K.H. and G. Shamuganathan. 2010. The influence of personality traits and demographic factors on social entrepreneurship start up intentions. *Journal of Business Ethics* 95(2): 259-282.

Nugin, R. 2014. I think that they should go. Let them see something: the context of rural youth’s out-migration in post-socialist Estonia. *Journal of Rural Studies* 34: 51-64.

Reniers, R.L., R. Corcoran, R. Drake, N.M. Shryane and B.A. Völlm. 2011. The QCAE: a questionnaire of cognitive and affective empathy. *Journal of Personality Assessment* 93(1): 84-95.

Shane, S., E.A. Locke and C.J. Collins. 2003. Entrepreneurial motivation. *Human Resource Management Review* 13(2): 257-279.

Sharma, L. 2014. Impact of family capital & social capital on youth entrepreneurship: A study of Uttarakhand state, India. *Journal of Global Entrepreneurship Research* 4(1): 14.

Singhapakdi, A., K.L. Kraft, S.J. Vitell and K.C. Rallapalli. 1995. The perceived importance of ethics and social responsibility on organizational effectiveness: a survey of marketers. *Journal of the Academy of Marketing Science* 23(1): 49-56.

Tatarko, A. and P. Schmidt. 2016. Individual social capital and the implementation of entrepreneurial intentions: the case of Russia. *Asian Journal of Social Psychology* 19(1): 76-85.

Thompson, E.R. 2009. Individual entrepreneurial intent: construct clarification and development of an internationally reliable metric. *Entrepreneurship Theory and Practice* 33(3): 669-694.

Tyszka, T., J. Cieslik, A. Domurat and A. Macko. 2011. Motivation, self-efficacy, and risk attitudes among entrepreneurs during transition to a market economy. *Journal of Socio-Economics* 40: 124-131.

Urban, B. 2013. Social entrepreneurship in an emerging economy: a focus on the institutional environment and social entrepreneurial self-efficacy. *Managing Global Transitions* 11(1): 3-25.

Urban, B. and H. Teise. 2015. Antecedents to social entrepreneurship intentions: An empirical study in South Africa. *Management Dynamics: Journal of the Southern African Institute for Management Scientists* 24(2): 36-52.

Van Gelderen, M., M. Brand, M. van Praag, W. Bodewes, E. Poutsma and A. van Gils. 2008. Explaining entrepreneurial intentions by means of the theory of planned behavior. *Career Development International* 13(6): 538-559.

Vecchio, R.P. 2003. Entrepreneurship and leadership: common trends and common threads. *Human Resource Management Review* 13(2): 303-327.

Wang, J.-H. and C. Liang. 2015. Empowerment through intrinsic motivation and self-efficacy: how personality traits influence rural practice in agricultural students? In: *Personality traits and types: perceptions, gender differences and impact on behavior*, edited by J. Hawkins. Nova Science Publishers, Hauppauge, NY, USA, pp. 109-132.

Wang, J.-H., L.-P. Peng and C. Liang. 2014. Developing and testing the psychological variable, rural practice, and entrepreneurial intentions scales. *Review of Agricultural Extension Science* 31: 72-95.

Williams, D. 2006. On and off the 'Net: scales for social capital in an online era. *Journal of Computer-Mediated Communication* 11(2): 593-628.

Wilson, F., J. Kickul and D. Marlino. 2007. Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: implications for entrepreneurship education. *Entrepreneurship Theory and Practice* 31(3): 387-406.

Wood, S. 2012. Prone to progress: Using personality to identify supporters of innovative social entrepreneurship. *Journal of Public Policy & Marketing* 31(1): 129-141.

Wurthmann, K. 2013. A social cognitive perspective on the relationships between ethics education, moral attentiveness, and PRESOR. *Journal of Business Ethics* 114(1): 131-153.

Zellweger, T., P. Sieger and F. Halter. 2011. Should I stay or should I go? Career choice intentions of students with family business background. *Journal of Business Venturing* 26(5): 521-536.