Influencing factors for pursuing agriculture as a career for agriculture undergraduates: A two-stage approach

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Research Article

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Abstract

The study's goal was to determine the variables that were linked to university students' intentions to pursue agricultural-related employment. Quantitative data was gathered from 323 students who were enrolled in various agricultural-based university programs in Bangladesh. Structural equation modeling (SEM) and artificial neural networks (ANN) were employed to examine the data. The results revealed that students' intentions to enter agricultural-related careers were predicted by their attitudes toward agriculture, agricultural knowledge, perceived behavioral control, facilities and resource conditions, innovativeness and creativity, career planning, perception of sustainable agriculture methods, perception of organizational support, and technological competency. Perceived behavioral control is the strongest predictor. Subjective norms, perceived value, and entrepreneurial capabilities were found the insignificant predictors. The results shed light on the parameters agricultural undergraduates take into account when selecting whether to pursue jobs in the field of agriculture. This can assist academic specialists in retaining and attracting students by meeting their demands for motivation. By including nine extra components, the study broadens the theory of planned behavior's application for predicting intention in the agricultural sector. The study first time examined the linear and nonlinear correlations among variables. The areas where programming efforts are most likely to be successful can be more clearly identified by having a deeper grasp of the variables that influence students' decisions regarding their future professions in agriculture.

Introduction

The whole world is concerned about the food crisis, especially after the beginning of the Russia-Ukraine war. The price of various goods and products has increased. Common people are struggling to purchase their daily goods in developing nations. Again, the United Nations projects that the 7.6 billion people who currently live on the planet will expand to 9.7 billion people by the year 2050, with emerging nations accounting for the majority of this growth (Zaremohzzabieh et al., 2022). The increase in global food consumption is being caused by this expansion as well as increased incomes in developing nations. Since the demand for food is predicted to rise by 59%-98% between 2005 and 2050, the Food and Agriculture Organization (FAO) has emphasized that this would provide a significant challenge to global agriculture. According to Zaremohzzabieh et al. (2022), current trends continue, and agricultural production will need to rise by close to 70%. Inevitably, more young people will be required to participate in the global agriculture industry to meet the task of feeding a booming population and an evolving global economy while also adjusting to shifting market needs. Nearly 16 percent of the world's population is now under the age of 24, making up a sizeable workforce that, if properly utilized, could satisfy the labor demands of the overworked agricultural industry (Feldt et al., 2019).

Research stated that the agricultural sector provides a wide range of opportunities for development and entrepreneurship (Zaremohzzabieh et al., 2022). Entrepreneurial opportunities abound in meeting the rising need for environmentally responsible farming methods, effective resource management, and guaranteed food supplies. Careers in agriculture provide opportunities for innovative thinkers to make an impact, whether through agri-tech firms, precision farming, or organic farming ventures. Farming enterprises that young entrepreneurs lead can increase their product range and their market worth. Young entrepreneurs can diversify their operations into value-added activities like processing, packaging, branding, and marketing and have options outside conventional production methods. Entrepreneurs can enter new markets, boost profits, and create distinctive goods that meet consumer tastes by adding value to basic agricultural resources. Again, in rural areas especially, agricultural entrepreneurship has the ability to boost economic growth and create new jobs (Khan et al., 2022). Entrepreneurship in agriculture has the potential to improve society and the natural world. Entrepreneurs in the agricultural sector can improve food security, lessen agriculture's impact on the environment, and effect positive social change if they adopt more ethical and environmentally friendly economic practices. These characteristics may be achieved through proper entrepreneurial education of the undergraduates.

A definite need for more young people to work in agriculture is shown by current trends, especially in subfields where new technologies are needed to address the effects of climate change. It is commonly understood that youth labor is crucial to tackling the many difficulties confronting the agriculture business since they are frequently less conventional and more eager

to adopt new methods and technology than aging growers (Daudu et al., 2009). To maintain economic security and future productivity in agriculturally based countries that continue to rely on older farmers, young engagement in agriculture is essential (K. M. Brooks et al., 2014; Zaremohzzabieh et al., 2022).

Recent works (Leavy & Hossain, 2014; Ojebiyi et al., 2015) have demonstrated that young curiosity in the agricultural area is waning internationally, notably in Latin America, Africa, and Asia. Tafere & Woldehanna (2012) claim that there are two main reasons why young individuals are disinterested in agriculture. One is that since non-agricultural occupations are expected to be less difficult, more secure, and offer greater compensation, young people often have "occupational goals" outside of farming. Another factor is that young people are prevented from pursuing careers in agriculture because they lack entree to or ownership of industrious resources, notably farming land. Furthermore, Suriname (2009) asserted that the unfavorable perception of agricultural workers does not support the notion that agribusiness is an appealing profession for young people. However, a lot of this connected research draws on studies of youths in general. There have been fewer studies specifically looking at agricultural undergraduates.

Although those who formally educate agriculture at the postsecondary level are best prepared to address the needs and problems facing the industry today, it is not a certainty that they would choose to work in the field (Baker et al., 2013). According to several studies (Chinsinga & Chasukwa, 2012; Ridha & Wahyu, 2017; Roy et al., 2016; Settle et al., 2012), university graduates in various nations have negative attitudes about agriculture and see it as a last resort for their future jobs. Additionally, during the past ten years, fewer graduates have sought jobs in agriculture than there have been open opportunities (Morgan et al., 2017). Therefore, educators and decision-makers must assess how agricultural students feel about working in the industry after graduation. One approach to achieve this is to gather data on the elements that influence students' predicted engagement. This knowledge may also be applied to improve educational opportunities and entice more pupils to the area.

In light of this, the present study seeks to investigate the paucity of research on factors that predict future agricultural student engagement in the agricultural industry. The country of Bangladesh is the center of this research, where a shortage of young people is a result of the agricultural sector's declining performance. An increasing body of research shows that youth engagement in agricultural activities is low in Bangladesh, which is mostly due to university students and new graduates' lack of interest in pursuing professions in agriculture (Khan & Roy, 2023; Khatun & Roy, 2022; Roy & Ahmed, 2016). Few researchers have tried to explain why this happens, even though it is a widespread phenomenon that is not unique to Bangladesh. As a consequence, the researcher looked at the connections between characteristics linked to motivation and a drive to go after careers in agriculture utilizing a revised rendition of the theory of planned behavior (TPB). Given its prior usage in relevant studies on youth engagement in agriculture, the researcher used the TPB to structure the study (Tiraieyari & Krauss, 2018). This represents the first investigation to apply the TPB framework for predicting agricultural career intention using both linear and nonlinear models.

In this study, a two-stage analytic technique is used to evaluate and validate the proposed model. The first phase was using PLS-SEM to assess the relationship and understand the impacts of various variables on the willingness to pursue an agricultural career. The second phase involved ranking the important antecedents and validating the PLS-SEM outcome using neural network modeling (NNM). In this work, artificial neural network (ANN) was used instead of standard statistical techniques since it is more effective at identifying nonlinear interactions as well as linear ones. The use of the NNM also effectively ensures the construct's validity. As a consequence, this study develops an improved model that can foresee a student's career ambition and overcome some of the key shortcomings of the present method.

Theoretical background and study hypotheses

To explore behavioral intention (BI) and its psychological ties to actual conduct, multiple theories have recently been developed (Ngai et al., 2015). The TPB, which continues to garner interest in several domains and is particularly pertinent to rural development and agricultural areas, is one of the frameworks that are most useful in this respect. The TPB is predicated on the idea that people who have optimistic attitudes about a circumstance are more likely to think favorably of them, which

affects how they act toward that issue (Ajzen, 1991). Scholars are adding components to the TPB to enhance its capacity for behavior prediction and to give an explanation for why good intentions do not always translate into action, to the need to explain BI in many circumstances (Arunrat et al., 2017; Liu et al., 2013). Although the TPB has been used to explain behavior in research relating to agriculture (for example, Mukembo et al., 2017; Tiraieyari & Krauss, 2018), the framework has not yet been specifically designed for the agricultural industry. It is necessary to do further research to fully grasp the effects of agricultural knowledge, education, learning motivation, the advancement of sustainable agriculture, and the connections between agriculture and other social elements of the undergraduate agricultural experience (Sitienei & Morrish, 2014).

The Theory of Reasoned Action (TRA) is expanded upon by the TPB (Ajzen, 1980). See Fig. 01. One of the most influential models for understanding and predicting human behavior is the TPB. (Lalani et al. 2016; Miller 2017, 2019). The TPB, which combines BI, attitude toward behavior (ATB), subjective norms (SN), and perceived behavioral control (PBC), serves as a representation of a person's perception of having authority over their actions (Brown et al., 2010; Lalani et al., 2016). BI measures how much people have made plans to engage in a particular future activity. The degree to which a person views a given conduct favorably or unfavorably is expressed in their ATB. SNs serve as criteria for determining whether or not certain persons accept or disapprove of acts, and they serve as motivation to conduct in a way that wins their approval. PBC measures how easily or difficulty a person can carry out a specific activity (Ajzen, 2011; Lalani et al., 2016).

Several scholars have utilized the TPB to predict BI in a variety of practical contexts, including agriculture, even though it has mostly been employed for forecasting behavior (Ali et al., 2020; Bagheri et al., 2019; Chowdhury & Roy, 2015; Daxini et al., 2018; Islam et al., 2021; Monteleone et al., 2019). The TPB asserts that individual participation in an activity immediately precedes one's desire to engage in it (Brayley et al., 2015). So, BI decides whether or not a person is ready to engage in an activity. The present work is predicated on the idea that intent is a reliable indicator of intended performance, particularly when the activity is challenging to see or has not yet happened (Ajzen, 2011). Similar to this, the real actions—undergraduates engaging in cultivation after completion of their degree—have not yet happened due to the characteristics of the present study. Intention models have been shown to have successfully predicted behavior in various research, although the two domains are separate (Ajzen, 2011). Thus, forecasting students' intention is useful for decision-makers in the field of agriculture.

This study employed an expanded TPB with 13 variables, taking into account the study's objectives and associated literature: attitude towards agriculture (ATA), perceived behavioral control (PBC), subjective norms (SN), perceived organizational support (POS), career planning (CP), agricultural knowledge (AK), innovativeness and creativity (IAC), entrepreneurial capability (EC), technological competency (TC), perceived value (PV), facilities and resource conditions (FRC), sustainable agriculture (SA), and agricultural career intention (ACI) to investigate Bangladeshi university students' BIs towards a career in agriculture.

Attitude toward agriculture (ATA)

The way a person feels when engaging in a certain behavior—whether positive or negative—is referred to as their attitude toward the behavior (Ajzen, 1991; Zaremohzzabieh et al., 2022). The perceptions and attitudes of young people about agriculture and their BIs have been positively correlated in previous research, for example, in India (Devi, 2015). According to Kidane and Worth (2014), high school students' opinions regarding agriculture have a significant impact on their decision to pursue agriculture at the university level in South Africa. Young farmers' intentions to utilize water management techniques in Iran were strongly correlated with attitudes (Yazdanpanah et al., 2015), and attitudes were a significant predictor of farmers' intentions to practice climatic data in agricultural activities (Sharifzadeh et al., 2012). Abdullah et al. (2012) discovered that attitude has a substantial influence on students' involvement in agricultural entrepreneurship in Malaysia. Therefore, the proposed proposition is:

H1: ATA has a significant impact on ACI for undergraduate students.

Subjective norms (SN)

The norms and ideals that people uphold, as well as the pressure from society to partake in that activity, have an impact on how someone feels about doing it (Ajzen, 1991). As a result, SNs are defined as the felt pressure to behave from powerful

people (such as classmates, family, instructors, and coworkers). In the setting of the present investigation, prior studies have demonstrated that SN in the sense of civic opinion and the persuasion of local persons may persuade pupils to either participate in or avoid the activities of agriculture (Akpan, 2010). According to research by Arisandi (2016) and Wijerathna et al. (2015), university agricultural students' entrepreneurial intentions were impacted by SN. Parents and instructors had the largest effect on students' decisions to study agriculture, according to Fizer's (2013) research. By examining the variables impacting first-year students' job options in Swaziland, Dlamini (2017) found that learners made choices based on their interests as well as the influence of their agriculture teachers, families, and peers. SNs have the power to encourage or discredit careers in agriculture, and this ultimately affects how people view the industry (Zaremohzzabieh et al., 2022). Therefore, the proposed proposition is:

H2: SN has a significant impact on ACI for undergraduate students.

Perceived behavioral control (PBC)

PBC is usually determined based on how easy or tough a task is judged to be. The stronger the individual's belief that the activity's execution is under his or her command, the more likely they are to act in that way (Engle et al., 2010). Although the results of previous studies have been somewhat inconsistent, PBC has often been associated with agricultural-related actions, especially in young populations. Young people are more likely to intend to work in the farming industry at a certain point in their lives if they feel they are capable of practicing sustainable agriculture (Yami et al., 2019). Due to their capacity to influence broader market outcomes and deal with potential agro-business issues, young students are able to foster an entrepreneurial mentality for agro-business (Yusoff et al., 2016). According to the TPB, students' perceptions of the viability of carrying out agricultural activities have an impact on their view of how relevant those perceptions are for accomplishing their aim of beginning a career in agriculture. Therefore, the proposed proposition is:

H3: PBC has a significant impact on ACI for undergraduate students.

Agricultural knowledge (AK)

To bring forth sustainable advancements in the industry, expertise linked to agriculture is essential (Mark, 1993). Several scholars mentioned that the TPB model has the ability to predict outcomes and increase awareness of a variety of behaviors, including those related to safety and health at work (Koo et al., 2014), buying ecologically responsive products (Yadav & Pathak, 2016), and disposing of domestic wastes (Xiao et al., 2017). In Taiwan, agricultural trainees' knowledge was proven to be a good predictor of their practice, according to Wang et al. (2010). The findings of a previous longitudinal case study involving 316 Stray birds enlisted from various Stray college birds encampments showed that understanding the frameworks of agricultural, food, and environmental resources can facilitate agricultural dialog, the assessment of the reliability of agricultural news accounts, the identification of local, national, and international agricultural issues, and the evaluation of agricultural assertions (Anderson et al., 2014). Therefore, the proposed proposition is:

H4: AK has a significant impact on ACI for undergraduate students.

Facilities and resource conditions (FRC)

Land, contemporary technology, structures, equipment, financial and technical support, and marketing of agricultural goods are examples of agricultural resource-enabling conditions. When the government tries to get young Africans interested in agriculture, many reportedly turn away because of issues with access to technology, financing, and extension services, for example (Naamwintome & Bagson, 2013). In a similar vein, Obayelu & Fadele (2019) claimed that a lack of government funding for agricultural studies, particularly insufficient enticements for undergraduates to enroll in agricultural operations in educational institutions, has an impact on students' views and attitudes about the subject. According to Proctor & Lucchesi (2012), having access to land helps ensure the food security of households and creates jobs. While young people throughout the world view access to land as crucial for starting a farm, they frequently encounter greater challenges than adults in doing so (Zaremohzzabieh et al., 2022). Poulton & Kanyinga (2013) emphasized that infrastructure encompasses various hardware expenditures that are frequently out of the price range of a rookie farmer. These consist of irrigation systems, rural roads,

power, storage facilities, and water processing and storing technologies (K. Brooks et al., 2013). The capacity of young farmers to enhance productivity, reduce risks, and maintain competitiveness is hampered by a lack of infrastructure. Youth engagement in agricultural activities may be increased in both volume and intensity when agricultural infrastructure and resources are easily accessible. Therefore, the proposed proposition is:

H5: FRC has a significant impact on ACI for undergraduate students.

Sustainable agriculture (SA)

SA practices are those that are based on an understanding of environmental sustainability. The main goal of employing such techniques is to satisfy food and growth requirements without threatening the capability of future compeers to do the same. SA prioritizes efficiency improvements that both improve the economy and save the environment (Affairs, 2008). In order to reduce tillage, plant crops, integrate livestock and crops, practice organic farming, use integrated pest management (IPM), rotate crops, adopt crop diversity, plant crops, plant crops, integrate livestock and crops, and manage entire systems and landscapes are all examples of SA practices. According to a recent study, boosting youth participation in SA might increase their potential to be effective participants in agricultural progress, especially in the future (Adnan et al., 2019). Young people's unfavorable ATA may be changed, and sustainable farming practices can function as a catalyst for economic development. Therefore, the proposed proposition is:

H6: SA has a significant impact on ACI for undergraduate students.

Innovativeness and creativity (IAC)

The demand for inventive thinkers and creative entrepreneurs is greater than ever in contemporary advanced industries, which are setting the standard for information and technology, and it will continue for years to come. Agriculture entrepreneurship is a creative endeavor that has the potential to be highly successful (Han et al., 2009). According to Sternberg (1999), creativity is the capacity to produce innovative and distinctive work as well as suitable and adaptable work when faced with job limits. In essence, it is a strategy used by agro-entrepreneur to take advantage of market developments and seize chances using creative methods. Therefore, IAC is crucial to the aim of an entrepreneur (Zarefard, 2017). Some scholars (Lumpkin et al., 2003; Zarefard & Cho, 2018) view creativity as a fundamental skill for entrepreneurs, while others define creativity as a collection of qualities that distinguish individuals (Lumpkin et al., 2003; Zarefard & Cho, 2018). By coming up with fresh concepts or reinventing old ones, creative thinking may lead to innovation. This IAC helps to link with ACI (Zarefard & Cho, 2018). Therefore, the proposed proposition is:

H7: IAC has a significant impact on ACI for undergraduate students.

Career planning (CP)

Students engage in CP activities while in college to determine whether they have a passion for exploring entrepreneurship as a profession (Banerjee et al., 2020; Saks & Ashforth, 2002). Compared to the fundamental desire to launch a firm, entrepreneurship education has a greater influence on personal development and job choice (Banerjee et al., 2020; Rae & Woodier-Harris, 2013). According to some studies, faculty members who teach entrepreneurship studies can help students make informed career decisions (Banerjee et al., 2020; Matlay, 2008), but other scholars have discovered contradictory results that show teachers and career advice counseling have little to no influence on graduate students' career decisions (Henderson & Robertson, 2000). Instead, their personal experiences and the setting of their family are the main elements that affect their CP (Banerjee et al., 2020). Therefore, the proposed proposition is:

H8: CP has a significant impact on ACI for undergraduate students.

Entrepreneurial capability (EC)

A person's capability indicates their expertise and may be utilized to advance cherished working relationships (Alkire, 2005). Individual characteristics and skills can have a big impact on someone's ambition to start an enterprise (Ramos, 2014).

According to Marzo-Navarro et al. (2009), students' ability to take the initiative, including their risk-taking and self-confidence levels, had an impact on their entrepreneurship and innovation in Spain. Students who had a strong belief in their expertise were more willing to engage in the tasks of entrepreneurship. Well-designed pedagogies can help students further develop the talents, qualities, and skills needed to launch a venture (Gibb & Hannon, 2006). Lessening students' fear of failure and giving them the confidence to launch their businesses are two benefits that higher education institutions that help students develop their ECs and provide them access to the required knowledge, networks, and skills may provide (Ho et al., 2014). Therefore, the proposed proposition is:

H9: EC has a significant impact on ACI for undergraduate students.

Perceived value (PV)

According to Rokeach (1973), values are personal convictions that direct conduct by utilizing implicit standards to assess individual prejudices (Flint et al., 1997). The concept of "PV" first surfaced as a commercial issue in the 1990s, and it was then expanded upon and studied in various disciplines (Sánchez-Fernández & Iniesta-Bonillo, 2007). For instance, in the areas of business, entrepreneurship, and tourism, it has been demonstrated that perceived economic, functional, and relational values affect satisfaction for consumers (Mustak, 2019; Oriade & Schofield, 2019). Agriculture's PV refers to the idea of extending this sense of value to the agricultural sector. According to Romstad et al. (2000), the PV of agriculture specifically covers matters like supplying food, protecting the environment, passing down outmoded values, and aiding in the upkeep and advance of the nation and humanity. Once more, PV significantly affects career intention.(Jeong et al., 2021). Therefore, the proposed proposition is:

H10: PV has a significant impact on ACI for undergraduate students.

Perceived organizational support (POS)

According toKraaijenbrink et al. (2010) and Saeed et al. (2015), POS encompasses three forms of university support. Educational support, which focuses on imparting entrepreneurial knowledge and skills, and business development support, which addresses the commercialization of business ideas, are deemed crucial as financial constraints hinder student entrepreneurship (Henderson & Robertson, 2000). Meanwhile, concept development support provides insight into business creation and fosters motivation (Saeed et al., 2015). Research has indicated that an individual's entrepreneurial intention may vary based on perceived support, with stricter and hostile business start-up policies leading to lower entrepreneurial tendencies (Saeed et al., 2015). Contextual support factors have been shown to impact self-efficacy beliefs, shaping specific career interests and goals (Lent et al., 2003). There is evidence from several works that entrepreneurship education and the intention to pursue an agricultural entrepreneurial career are positively correlated (Abhayarathne, 2021; Chowdhury et al., 2019; Fini et al., 2009; Nabi & Liñán, 2011). Therefore, the proposed proposition is:

H11: POS has a significant impact on ACI for undergraduate students.

Technological Competency (TC)

Technology encompasses the fusion of knowledge embedded in products and processes, resulting in technological innovations, knowledge, and products. Entrepreneurial success in creating innovative products and services requires a wide range of knowledge and skills, referred to as knowledge and TC (Dosi, 1982; Nerkar & Roberts, 2004). These competencies are also crucial for entrepreneurial founders in technical and functional roles in a knowledge-based economy (H. Kaur & Bains, 2013; J. Kaur & Kumar, 2013). TC significantly impacts ACI (Zarefard & Cho, 2018), while (Suwanan, 2021) found no significant correlation. Therefore, the proposed proposition is:

H12: TC has a significant impact on ACI for undergraduate students.

Analytical approach

The TPB is strong not only in predicting behavior and intentions but also in guiding the development of targeted behavior change strategies (Sheppard et al., 1988). Although the model has been successful, some scholars argue that it needs improvement since the three original TPB factors do not fully account for the various factors that influence youth participation in agriculture (Zaremohzzabieh et al., 2022). According to some scholars, the power of the intention-behavior association relies on the level of control the individual has over performing the behavior. Control factors such as knowledge, CP, and properties are crucial in estimating the extent of an individual's control over the behavior (Sheeran, 2002). Figure 2 displays the research framework for the current study, which is based on the TPB model and previous research. The framework expands on the TPB by introducing additional constructs such as POS, CP, AK, IAC, EC, TC, PV, FRC, and SA.

Although the TPB acknowledges that people may not always have the requisite control to follow through on their goals, it nonetheless holds that intention is the major predictor of action (Ajzen, 2011). To measure intentions accurately, Ajzen (1980) suggests assessing them as close as possible to the time of behavior. The researcher examines student involvement in the agriculture sector using the present analytical framework based on the desire to engage rather than actual activity. Because the study sample consisted of undergraduate learners taking agricultural programs who had not yet participated in conventional farming endeavors, the researcher thought that looking at BI would, for the time being, improve the present model's capacity for prediction.

Materials and methods

Participants and procedures

Quantitative information was gathered from undergraduate students participating in agriculture studies at particular Bangladeshi institutions using self-administered surveys. These universities prioritize channeling resources towards important agricultural industry goals and offer extensive coursework and practical learning to stimulate youth interest in agriculture. The purpose of choosing this particular set of responders was to learn more about their possible involvement in the agriculture industry following graduation.

The survey involved 350 undergraduate agricultural students from various agricultural universities in Bangladesh, with a minimum of five respondents from each university. Partial self-administered convenience sampling polls (Khan et al., 2019; Roy et al., 2021) were used in the study, and questionnaires were distributed to students and collected by interviewers after checking for incomplete data. The sample was chosen by the researcher from students majoring in either agricultural or agribusiness courses. After excluding outliers, the study included 323 out of the 350 students, resulting in a response rate of 92.29 percent. The study sample's descriptive statistics are shown in Table 1, indicating that the vast majority of respondents (97.8%) were younger than 25 years old, and the majority were male (74.3%). A majority of the respondents (61.9%) came from rural regions, and more than half of them (65.0%) stated that a minimum of one family member worked in the agriculture industry.

Table 1
Undergraduate student's profile

Variables	Categories	Frequency	Percent
Gender	Male	240	74.3
	Female	83	25.7
Age (in years)	< 21	10	3.1
	21–25	306	94.7
	> 25	7	2.2
Academic year	1st year	25	7.7
	2nd year	44	13.6
	3rd year	205	63.5
	4th year	49	15.2
Resident	Rural	200	61.9
	Urban	123	38.1
Family members/relatives involved in agriculture	Yes	210	65.0
	No	113	35.0
	Total	323	100

Measures

The survey included twelve independent variables: ATA, SN, PBC, POS, CP, AK, FRC, SA, IAC, EC, TC, and PV. The dependent variable in the study was the ACI of undergraduate students. In the study, all variables were measured using a 7-point Likert scale, where 1 represented "strongly disagree" and 7 represented "strongly agree." To ensure that the questionnaire was relevant to the study context, several items were adjusted to reflect the specific factors that may influence undergraduate students' intention to pursue a career in agriculture. All the items were taken from the previous studies. The data items are shown in Appendix A.

Data analysis

For the data analysis in this study, SmartPLS software was used to run PLS-SEM (Ringle, 2015). PLS is a better method for analyzing a sequence of dependent connections concurrently when doing research for predicting anything (Hair et al., 2019). Researchers used a two-step strategy to examine outcomes, following PLS-SEM principles (Hair et al., 2019). In the initial stage of the PLS-SEM technique, the test's inter-item reliability, convergent validity, and discriminant validity were evaluated. The structural model was tested in stage two to test hypotheses and assess its propensity for prediction (Roy, 2023a, 2023c).

Assessment of measurement model

The researcher used factor loading (λ), Cronbach's alpha (α), composite reliability (CR), average variance extracted (AVE), and discriminant validity to assess the measurement model (Hair et al., 2019). The λ, α, and CR values need to be greater than 0.70 (Hair et al., 2019; Roy, 2022). The study results revealed that the λ, α, and CR values are higher than the recommended cutoff. Again, the AVE values are higher than the expected cutoff of 0.50. Fornell & Larcker (1981) criteria (FLC) and Heterotrait-Monotrait ratio (HTMT) characteristics were employed to estimate the discriminant validity. The HTMT scores are less than the targeted cutoff score of 0.85 (Kline, 2015). So, the convergent and discriminant criteria of the study have been confirmed. Table 2 and Table 3 represent the outcomes.

Table 02
Convergent validity

Constructs	Items	λ	α	CR	AVE
Agricultural career intention (ACI)	ACI1	0.917	0.954	0.963	0.815
	ACI2	0.914			
	ACI3	0.908			
	ACI4	0.911			
	ACI5	0.869			
	ACI6	0.896			
Agricultural knowledge (AK)	AK1	0.867	0.946	0.956	0.756
	AK2	0.894			
	AK3	0.848			
	AK4	0.892			
	AK5	0.861			
	AK6	0.870			
	AK7	0.854			
Attitude towards agriculture (ATA)	ATA1	0.873	0.907	0.931	0.730
	ATA2	0.861			
	ATA3	0.861			
	ATA4	0.851			
	ATA5	0.824			
Career planning (CP)	CP1	0.857	0.918	0.938	0.753
	CP2	0.886			
	CP3	0.878			
	CP4	0.851			
	CP5	0.866			
Entrepreneurial capability (EC)	EC1	0.833	0.928	0.942	0.699
	EC2	0.867			
	EC3	0.863			
	EC4	0.824			
	EC5	0.808			
	EC6	0.829			
	EC7	0.827			
Facilities and resource conditions (FRC)	FRC1	0.877	0.931	0.946	0.744
	FRC2	0.864			

Constructs	Items	λ	α	CR	AVE
	FRC3	0.859			
	FRC4	0.853			
	FRC5	0.861			
	FRC6	0.861			
Innovativeness and creativity (IAC)	IAC1	0.850	0.923	0.938	0.684
	IAC2	0.828			
	IAC3	0.829			
	IAC4	0.826			
	IAC5	0.794			
	IAC6	0.845			
	IAC7	0.817			
Perceived behavioral control (PBC)	PBC1	0.852	0.914	0.936	0.744
	PBC2	0.887			
	PBC3	0.868			
	PBC4	0.850			
	PBC5	0.855			
Perceived organizational support (POS)	POS1	0.874	0.919	0.939	0.755
	POS2	0.877			
	POS3	0.855			
	POS4	0.855			
	POS5	0.882			
Perceived value (PV)	PV1	0.884	0.921	0.938	0.717
	PV2	0.858			
	PV3	0.868			
	PV4	0.860			
	PV5	0.778			
	PV6	0.828			
Sustainable agriculture (SA)	SA1	0.875	0.948	0.956	0.732
	SA2	0.858			
	SA3	0.885			
	SA4	0.832			
	SA5	0.836			
	SA6	0.862			
	SA7	0.850			

Constructs	Items	λ	α	CR	AVE
	SA8	0.847			
Subjective norms (SN)	SN1	0.739	0.867	0.897	0.638
	SN2	0.780			
	SN3	0.885			
	SN4	0.858			
	SN5	0.718			
Technological competency (TC)	TC1	0.825	0.922	0.942	0.763
	TC2	0.916			
	TC3	0.882			
	TC4	0.860			
	TC5	0.883			

Table 03
Discriminant validity

FLC	ACI	AK	ATA	CP	EC	FRC	IAC	PBC	POS	PV	SA	SN	TC
ACI	0.903												
AK	0.800	0.870											
ATA	0.767	0.712	0.854										
CP	0.795	0.722	0.695	0.868									
EC	0.783	0.757	0.657	0.703	0.836								
FRC	0.801	0.741	0.683	0.756	0.697	0.862							
IAC	0.799	0.758	0.654	0.682	0.747	0.770	0.827						
PBC	0.778	0.679	0.684	0.691	0.712	0.648	0.687	0.862					
POS	0.767	0.674	0.658	0.684	0.676	0.695	0.702	0.649	0.869				
PV	0.276	0.260	0.258	0.318	0.248	0.233	0.201	0.192	0.189	0.847			
SA	0.759	0.683	0.699	0.707	0.684	0.699	0.685	0.671	0.651	0.293	0.856		
SN	0.193	0.200	0.151	0.208	0.175	0.244	0.237	0.086	0.209	0.265	0.139	0.799	
TC	0.715	0.608	0.602	0.609	0.645	0.608	0.653	0.615	0.650	0.150	0.526	0.235	0.874
HTMT													
ACI													
AK	0.841												
ATA	0.824	0.768											
CP	0.849	0.774	0.761										
EC	0.831	0.807	0.714	0.760									
FRC	0.849	0.788	0.743	0.818	0.749								
IAC	0.849	0.810	0.713	0.739	0.806	0.829							
PBC	0.832	0.730	0.751	0.753	0.772	0.701	0.746						
POS	0.817	0.721	0.718	0.743	0.730	0.748	0.760	0.707					
PV	0.290	0.275	0.280	0.343	0.263	0.249	0.211	0.205	0.201				
SA	0.796	0.719	0.752	0.757	0.727	0.743	0.728	0.719	0.693	0.311			
SN	0.183	0.198	0.158	0.214	0.165	0.244	0.233	0.093	0.224	0.304	0.145		
TC	0.762	0.650	0.657	0.661	0.697	0.655	0.709	0.669	0.706	0.158	0.561	0.221	

Note: The bold and italic values represent the square root of the AVE values.

Assessment of Structural equation

This study employed PLS-SEM techniques to estimate the independent variables' impact on the ACI variable. See Fig. 02. A closer estimation of the relationships exhibits that ATA ($\beta = 0.096, p < 0.05$), PBC ($\beta = 0.143, p < 0.01$), AK ($\beta = 0.114, p < 0.05$), FRC ($\beta = 0.133, p < 0.01$), SA ($\beta = 0.088, p < 0.05$), IAC ($\beta = 0.107, p < 0.05$), CP ($\beta = 0.112, p < 0.05$), POS ($\beta = 0.109, p < 0.05$), and TC ($\beta = 0.123, p < 0.01$) had a significant impact on ACI and supporting hypotheses H1, H3, H4, H5, H6, H7, H8, H11 and H12.

On the other hand, results showed that SN (*β = -0.021, p > 0.05*), EC (*β = 0.063, p > 0.05*), and PV (*β = 0.032, p > 0.05*) had no statistically significant on ACI and consequently not supporting the hypothesis H2, H9, and H10. Table 4 represents the results of path modeling.

Table 04: Path results

Hypotheses	Relationships	β	t-values	p-values	Supported
H1	ATA -> ACI	0.096	2.295	0.022	✓
H2	SN -> ACI	-0.021	0.820	0.412	X
H3	PBC -> ACI	0.143	3.449	0.001	✓
H4	AK -> ACI	0.114	2.454	0.014	✓
H5	FRC -> ACI	0.133	2.695	0.007	✓
H6	SA -> ACI	0.088	2.336	0.020	✓
H7	IAC -> ACI	0.107	2.243	0.025	✓
H8	CP -> ACI	0.112	2.186	0.029	✓
H9	EC -> ACI	0.063	1.571	0.117	X
H10	PV -> ACI	0.032	1.319	0.188	X
H11	POS -> ACI	0.109	2.346	0.019	✓
H12	TC -> ACI	0.123	3.211	0.001	✓

Predictive power (R^2) and predictive relevance (Q^2)

The study estimates the coefficient of determination (R^2) and predictive relevance (Q^2). These metrics aid in assessing the structural model's quality. The study model has enough explanatory power as the independent variables explained 85.0% of the variance in ACI. The Q^2 value needs to be more than 0 (Chin et al., 2020). The Q^2 value for ACI was 0.683. So, the model has fair predictive relevance. One other metric for evaluating model fit is the goodness of fit (GoF) index. The study used Henseler et al. (2015) suggested method for assessing standardized root mean square residuals (SRMR) with a maximum threshold value of 0.080. For this study, the SRMR value was 0.044. So, the study has substantial goodness of fit.

Results of the Neural network (NN)

Nowadays, several academic areas use ANN modeling, a well-liked machine-learning method. According to Roy (2023), an ANN is "an immensely parallel distributed processor composed of fundamental processing parts that have a natural propensity to preserve experimental information and make it usable." The goal of ANN is to mimic the operation of the human brain. ANN uses "training" to uncover any hidden correlations in the input dataset, and "testing" shows how the learning has been put to use. ANN is used to explore complex relationships since it makes no assumptions about the multivariate data distribution (Chong, 2013). Compared to traditional statistical methods like SEM or regression, ANN has a significant advantage. Whereas conventional statistical methods can only evaluate linear correlations, ANN may evaluate non-linear correlations between components in a model (Roy, 2023b).

Neural network results validation

The SPSS (version 22) program was used to generate an ANN model. An extensively used feed-forward back-propagation multilayer training method was used to train the ANN model for this investigation (Sharma et al., 2021). With the aid of

multilayer perceptron and sigmoid activation algorithms, the input and hidden nodes were built. The 10-fold cross-validation method was used in this work to avoid overfitting, which is a problem for ANNs. As many academics advised, this work used the frequently rummaged-through Root Mean Square Error (RMSE) to validate the ANN assessment outcomes (Chong, 2013). In this investigation, 90% of the data sets were used for training, while the remaining 10% were used for testing (Roy, 2023).

The ANN investigation, according to the current research, only used one model. The input layer (neurons) of the ANN model contained ATA, PBC, POS, CP, AK, FRC, SA, IAC, and TC (only significant predictors), while the output layer contained ACI. The training and testing errors are shown by the RMSE. The RMSE evaluation is described in Table 5. The average RMSE values, which are 0.048 and 0.050, respectively, for the training and testing methods, are quite small. As a consequence, the researcher asserts that the model fits well and that the findings of the ANN study were entirely trustworthy (Sharma et al., 2021). See Fig. 3.

Table 5: RMSE results.

Training		Testing		Total sample
N	RMSE	N	RMSE	
285	0.046	38	0.049	323
293	0.046	30	0.044	323
292	0.054	31	0.041	323
287	0.046	36	0.051	323
282	0.049	41	0.045	323
292	0.044	31	0.053	323
283	0.046	40	0.048	323
292	0.048	31	0.040	323
285	0.052	38	0.070	323
292	0.049	32	0.055	324
Mean	***0.048***		***0.050***	
SD	***0.003***		***0.008***	

Sensitivity analysis

Researchers used sensitivity analysis to assess the relative importance of the various predictors. A sensitivity analysis is a method for determining which input factors have the most impact on the model's predicted results. In the context of ANNs, it can shed light on how different inputs affect the network's predictions or outcomes. It's useful for model optimization, feature selection, and understanding the model's behavior because it reveals which factors impact the network's performance most. By dividing the relative value of each predictor by its greatest importance, this method provides a percentage representing the normalized relevance of the predictors. Sensitivity analysis demonstrates how the response variable might fluctuate depending on changes in the independent elements connected to it. In the current inquiry, the importance of ATA, PBC, POS, CP, AK, FRC, SA, IAC, and TC in predicting the ACI has been calculated to generate the outcome (Chong, 2013). (Table 6). Considering the outcomes of the sensitivity investigation, PBC is the most important predictor for ACI from the ANN analysis, with the maximum normalized significance of 83.1%, followed by CP (82.8%), TC (75.3%), and so on. Hence, the researcher may conclude from the results of ANN that, when compared to other independent factors, the PBC is the construct that has the most influence on predicting the ACI of young pupils.

Table 6
Sensitivity analysis.

NN	AK	ATA	CP	FRC	IAC	PBC	POS	SA	TC
1	0.081	0.110	0.143	0.101	0.132	0.136	0.116	0.067	0.113
2	0.125	0.109	0.134	0.091	0.102	0.149	0.104	0.063	0.123
3	0.113	0.109	0.120	0.038	0.152	0.072	0.133	0.145	0.118
4	0.090	0.118	0.086	0.149	0.103	0.125	0.125	0.062	0.141
5	0.065	0.109	0.105	0.077	0.052	0.152	0.188	0.144	0.109
6	0.089	0.093	0.149	0.126	0.118	0.142	0.105	0.069	0.108
7	0.108	0.093	0.138	0.116	0.051	0.103	0.113	0.101	0.178
8	0.060	0.131	0.153	0.062	0.093	0.172	0.097	0.089	0.143
9	0.137	0.123	0.176	0.074	0.104	0.157	0.099	0.091	0.038
10	0.145	0.057	0.116	0.148	0.087	0.120	0.090	0.113	0.123
Average Importance	**0.1013**	**0.1052**	**0.1320**	**0.0982**	**0.0994**	**0.1328**	**0.1170**	**0.0944**	**0.1194**
Normalized Importance	**64.2%**	**65.8%**	**82.8%**	**62.6%**	**63.8%**	**83.1%**	**73.1%**	**58.6%**	**75.3%**

Findings

The study aims to investigate the influential factors that affect undergraduates' ACI. The study used twelve independent factors to estimate university students' ACI. The independent variables were ATA, PBC, AK, FRC, SA, IAC, CP, POS, TC, SN, EC, and PV. Among these twelve variables, ATA, PBC, AK, FRC, SA, IAC, CP, POS, and TC were significant predictors of ACI. On the other hand, SN, EC, and PV had no significant effect on ACI. According to the PLS-SEM findings, PBC is the strongest predictor of ACI (since $\beta = 0.143, p < 0.01$). Again, this study applied ANN to validate the SEM estimates. According to the ANN analysis, PBC was also found to be the best significant factor of ACI. The outcomes will be helpful for policymakers.

Discussion and conclusion

Agriculture has long had a reputation as a low-tech, static industry driven by a large number of tiny family businesses more concerned with incremental improvements than radical disruption. This position has drastically altered over the past decade due to economic liberalization, lessened safeguards for agricultural markets, and a rapidly evolving, more critical community. Market shifts, more environmental restrictions, food safety and manufacturing standards, sustainability concerns, and so on all place increased demands on the agricultural industry. These shifts have encouraged newcomers to the market, new forms of invention, and renewed cycles of entrepreneurialism within established enterprises. Scientists, businesspeople, and policymakers agree that entrepreneurial education is essential for today's farmers and producers. So, there is a need for young entrepreneurs to contribute to the agriculture sector. Again, there are a lot of obstacles in the agricultural sector, such as low productivity, inefficient supply chains, difficulty gaining access to markets, and environmental sustainability worries. Entrepreneurs with the right education and experience in the agricultural sector will see these difficulties as opportunities. They can fill these needs and benefit the agricultural economy by coming up with novel products, services, or methods.

Studies show that many graduates do not pursue jobs in agriculture, even if those studying agriculture in academic schooling are more likely to do so. Agriculture is sometimes seen as a last-choice profession, especially in nations where it is believed that the prospects for future profits in this industry are poor. As a result, an essential precondition for focused hiring and retraining is understanding the career aspirations agricultural students have for the industry. So, the study fills in a crucial vacuum regarding students' perceptions of agriculture as a profession. This is the initial study that has been done to look at the intents of Bangladeshi agriculture students in terms of their career choice. The study offers information for additional research outside of Bangladesh as well as for initiatives targeted at encouraging agricultural undergraduates to pursue

employment in fields connected to agriculture, even if the results cannot be generalized across Bangladeshi tertiary agricultural schools. It is possible to become more aware of the areas where programming efforts are most likely to be successful by identifying a group of linked elements. Also, the findings are consistent with the idea that cross-cultural relationships between the TPB's components are comparable.

A poll of pupils attending several agricultural higher education schools helped the study's key goals to be accomplished. The investigation was framed using an extended model of the TPB. SEM and ANN were used to get the results. Students' ATA and PBC, two original TPB components, were up as important predictors of ACI. Both findings are in line with earlier research on students' intentions to engage in agricultural sectors (Ridha & Wahyu, 2017; Tiraieyari & Krauss, 2018; Zaremohzzabieh et al., 2022). The intention of students was significantly predicted by their attitude toward a career in agriculture. Undergraduates are more motivated to hunt professions in agriculture if they think that doing so would benefit them and their societies (Jones et al., 2017). PBC is the strongest predictor of a student's intention. Students are more likely to choose a career path in which they feel competent to carry out the necessary work duties and activities.

The ACI of students studying agriculture was not predicted by SN. This outcome was consistent with the result of Zaremohzzabieh et al. (2022). This result conflicts with other comparable research that claims that SNs are a predictor of young people's involvement in agriculture (Amiry et al., 2015; Tiraieyari & Krauss, 2018). According to Hofstede's theory, in collectivist societies, SNs primarily impact people through their strong connections (Brewer & Venaik, 2011). It is somewhat interesting that SNs failed to forecast intention in the present research, given the collectivist structure of Bangladeshi culture. The impact of cultural norms probably varies from one nation to the next, making it contextually different for the influence of SNs on the decision to follow a certain profession (Zellweger et al., 2011). The research also raises the notion that modern adolescents, including those from collectivist countries, make professional selections based more on personal than communal reasons. Because they tend to be more autonomous and unaffected by others around them, older, more educated teens may also make decisions with less regard to social norms.

Seven of the nine constructs that were incorporated into the initial TPB model have a strong relationship with intention. Mianaji (2018) asserts that having access to and using AK boosts young farmers' enthusiasm and confidence to work in the field. The results of the study appear to support this claim. Similar to the previous results (De Man, 2012; Njeru & Mwangi, 2015; Oliveira et al., 2014), FRC can forecast students' intentions to work in agriculture. With the quick changes in technology and government assistance, sufficient resource allocation knowledge, as well as parental agricultural support throughout undergraduate programs, help students be productive in the agricultural industry (Cai et al., 2017). The outcomes also show how SA practices may make agricultural occupations more appealing to young people. This is consistent with several recent studies (Mutyasira et al., 2018; Zaremohzzabieh et al., 2022) that look at young people's increasing attention to technology-driven SA techniques. SA tends to pique the attention of agricultural students more than conventional agriculture, according to Mutyasira et al. (2018), who contend that this is because they see SA as being both more economically and environmentally sound.

According to the results of the study, IAC significantly correlated with ACI. This result was consistent with earlier outcomes (Sargani et al., 2019; Zarefard & BERI, 2017). The ACI of the students fosters them to select agriculture as a career. Analogous to the results of Banerjee et al. (2020), it demonstrates that CP has a strong favorable impact on advancing agri-entrepreneurship goals. So, a well-planned job intention may help young people to increase their intention to choose agricultural work in the future. Again, the results revealed that EC does not predict the intention of the students. This result is contradictory to the previous result (Banerjee et al., 2020; Ramos, 2014). This factor needs to study more. In Spain, students' capacities for advancement, such as risk-taking and self-confidence, had an impact on their entrepreneurial endeavors (Marzo-Navarro et al., 2009), but in the context of Bangladesh, it has no impact. Many young people who start their agri-businesses out of necessity rather than opportunity make use of their skills and work ethic to bridge the educational gap (Slack, 2005). So, higher education institutions may concentrate on intensification the entrepreneurial capabilities of young students.

The study results demonstrate that PV is not significant to ACI. This result differed from the previous result (Jeong et al., 2021). Youths were well aware of the virtues of agriculture, but they lacked strong emotional ties to it and lacked the desire to

pursue jobs in agriculture. Although there are classes that emphasize the virtues and significance of agriculture, there aren't many opportunities to experience it. In this context, it may also be inferred that the ambition to pursue an agricultural profession was relatively low. Several studies have shown and reaffirmed that entrepreneurial education has a favorable influence on promoting career intention concerning the impact of university assistance (Potishuk & Kratzer, 2017). According to earlier studies, the desire to pursue an agricultural job and POS are related (Abhayarathne, 2021; Trivedi, 2016). The current study confirms a related conclusion about the setting of underdeveloped countries, particularly with regard to agriculture students. Based on the results of the current study, one may claim that POS for entrepreneurship can improve people's perceptions of their capacity and competence to participate in entrepreneurship, which in consequence, increases the possibility that a graduate would pursue an agricultural profession. Finally, the study results revealed that TC is a significant predictor of ACI. This result was in line with the previous result (Zarefard & BERI, 2017). So, it can be argued that TC increases students' intention to choose an agricultural career. For example, students who are proficient in cultivation methods, the creation of organic pesticides, the creation of compost, and the management of pests and illnesses tend to have superior field knowledge and are more motivated to seek a profession in agriculture.

Nine of the factors that predicted career intention in agriculture were identified as being significant, although their order of significance for career intention was unclear. To prioritize the determinants of ACI, the study used ANN modeling. Again, the capacity for assessing non-compensatory judgment processes as either linear or non-linear makes neural network analysis superior to other popular statistical approaches once more. Like the PLS-SEM finding, the ANN analysis results demonstrate that PBC is the most pertinent ACI predictor.

Implications for practice

The results shed light on the variables Bangladeshi agricultural students think about while determining whether or not to pursue jobs in agriculture. For the first time, the study predicts career intention by combining twelve independent components. Decision-makers must adapt their recruiting strategies to meet the motivating demands of undergraduates to draw in and keep university students studying agriculture. Another strategy to change students intend to encourage them to choose agriculture as a profession (Huff et al., 2016). Higher educational institutions (HEIs) must make sure that the curriculum addresses any probable difficulties and issues that pupils may have. Step-by-step practical instruction, opportunities for fieldwork, technical assistance, and other professional involvements may care for undergraduates' future job aspirations, advance their understanding of agriculture, define employment requirements, and encourage them to see the possibilities of a profession in agriculture. The findings of the present study emphasize once more how important it is to use sustainable agriculture techniques as a basis for encouraging students to choose employment in the industry. So, more environmentally sustainable, realistic, and effective training must be taken into consideration to better locate and keep individuals interested in pursuing agricultural degrees.

Furthermore, the results may help educators make changes to their curricula to better prepare students to succeed in the business world. Few of Bangladesh's HEIs offer entrepreneurship courses and provide their students with individualized CP programs, competence improvement (EC) training to improve their entrepreneurial skills or links to the environment network. Therefore, the researcher recommends establishing EC and CP in HEIs in order to foster students' innate entrepreneurial spirit. Agri-business entities, such as agri-input providers and agri-tech firms, will find this research useful as they look for expansion potential in agri-allied industries. Corporations can finance the development of facilities and the hiring of trainers/facilitators at which young people can learn the skills they need to launch successful businesses. When students acquire the knowledge and skills necessary to function as agri-entrepreneurs, they play a significant role in the agricultural supply chain and have the potential to increase revenue for agri-businesses.

Again, the findings of this study have important significance for higher education faculty and policymakers looking to strengthen entrepreneurial programs. There is a close relationship between many managerial skills and the rise of entrepreneurship among undergraduates. Therefore, universities must play crucial roles in encouraging entrepreneurial aspirations by introducing suitable programs to develop students' managerial competencies in terms of sufficient information, technological knowledge, talents, and skills. Academics may find the results of this research useful since they expand the

body of knowledge on the factors that influence career choices by including an emerging field of student competencies. Experts, such as university instructors and policymakers, might benefit from the study's findings because they can utilize the information to design a more effective curriculum that encourages students to think entrepreneurially.

The agricultural industry needs both genders as important resources. Institutions should support the continued skills and knowledge development of female learners through their institutional channels since they could be less conscious of the wide range of options the industry has to offer (Zaremohzzabieh et al., 2022). Following the requirements and concerns of both groups, universities should start and keep up an active recruitment program to help provide career prospects for rural and urban agriculture students. Students may be more inspired to engage in the agricultural sector when such possibilities are commonly accessible, and resources are simple to acquire since they know there is educational and governmental support. The results of the ANN study indicate that PBC is the most important predictor of career intention. Essentially, students perceived behavior and self-confident need for sophisticated patron for developing agriculture career.

Limitations and future research

In addition to the above-mentioned contributions, the current study has important limitations. Self-administered surveys were employed in the study, which renders it challenging to gain a comprehensive picture of the topic under consideration. An improved understanding of the issue would have been achieved by using a mixed-method tactic that used quantitative and qualitative techniques to investigate the factors that influence BI. This study just takes into account independent factors to predict ACI; a future study may take into account mediator variables, for example, communications skills. Future studies should think about employing longitudinal strategies to investigate the extent to which the TPB forecasts undergraduates' BI in terms of profession choice by examining past students who are now employed in agriculture. With their eagerness to absorb novel concepts, ideas, and technology, young people are the appropriate catalysts for the agriculture sector's development. So, on the propensity of young people to adopt current farming techniques, further research is required.

Declarations

Declaration of competing interest

The author declares no conflict of interest.

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Ethical Statement

The researcher confirms that all research was performed in accordance with relevant guidelines/regulations applicable when human participants are involved (e.g., Declaration of Helsinki or similar).

Informed consent

Informed consent was obtained from all participants in this study.

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Figures

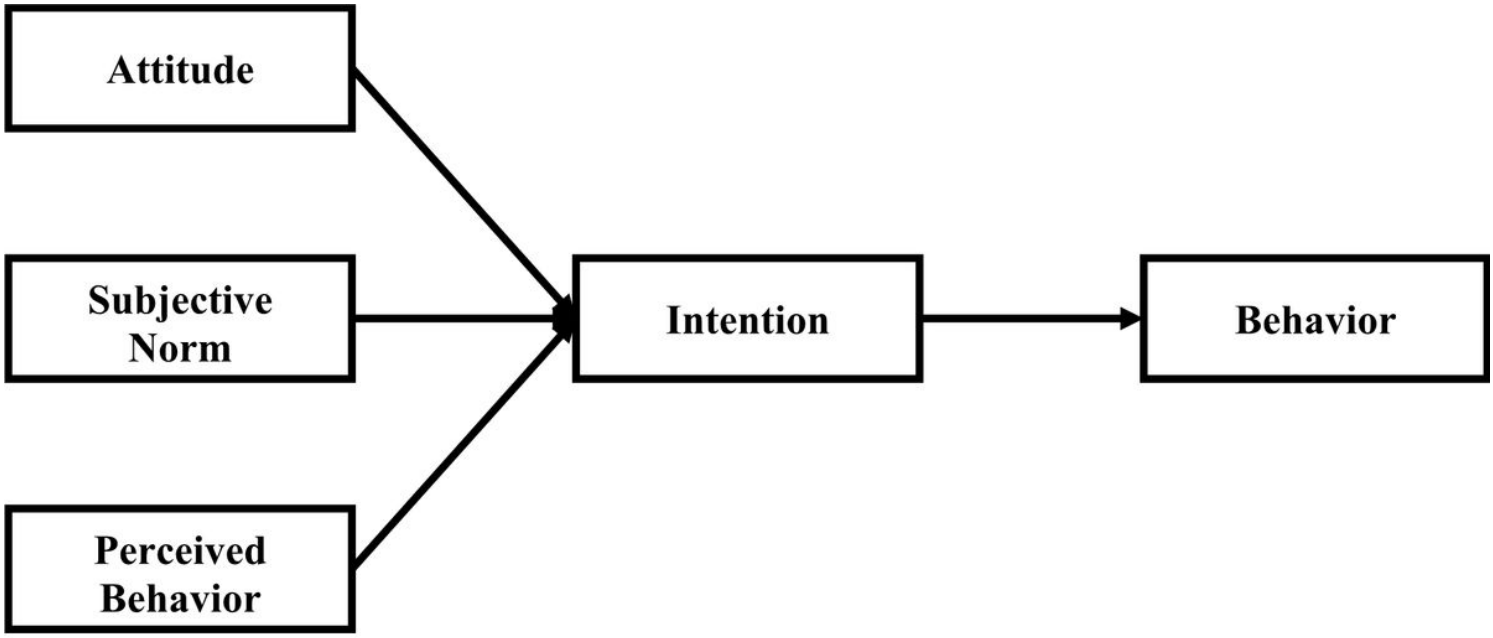

Figure 1

Theory of Planned Behavior (Ajzen, 1991)

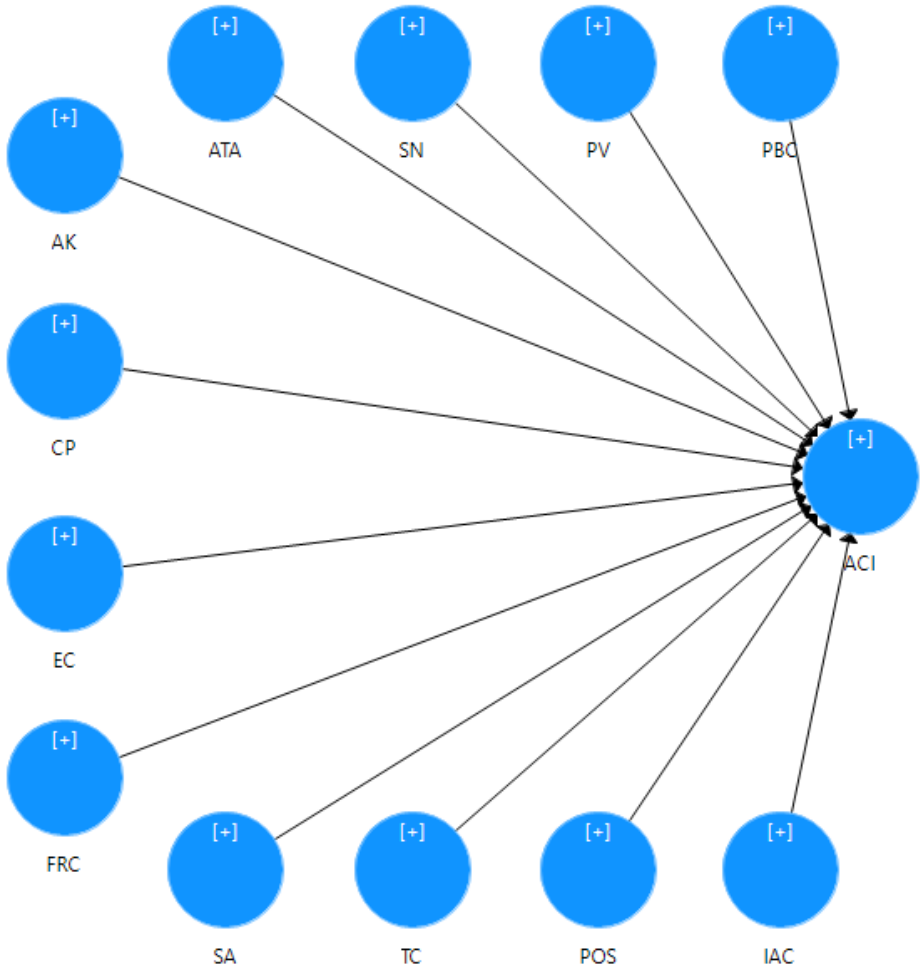

Figure 2

Proposed model

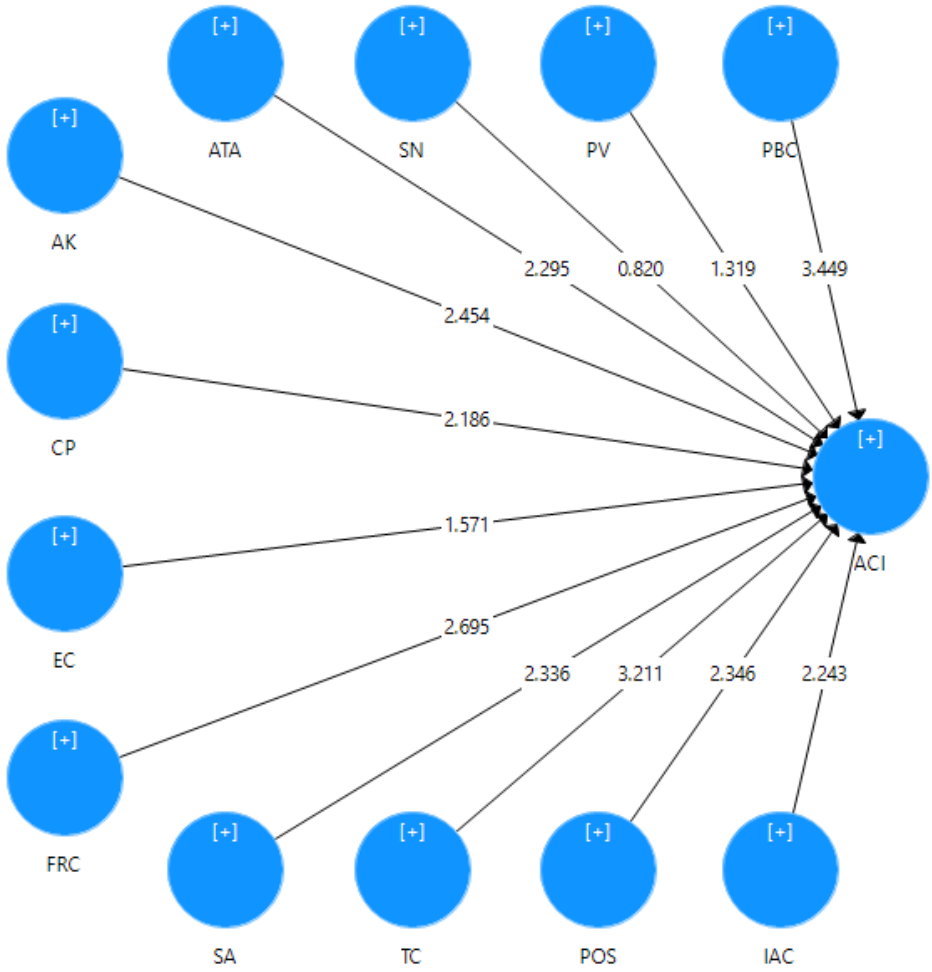

Figure 3

Results of the structural model

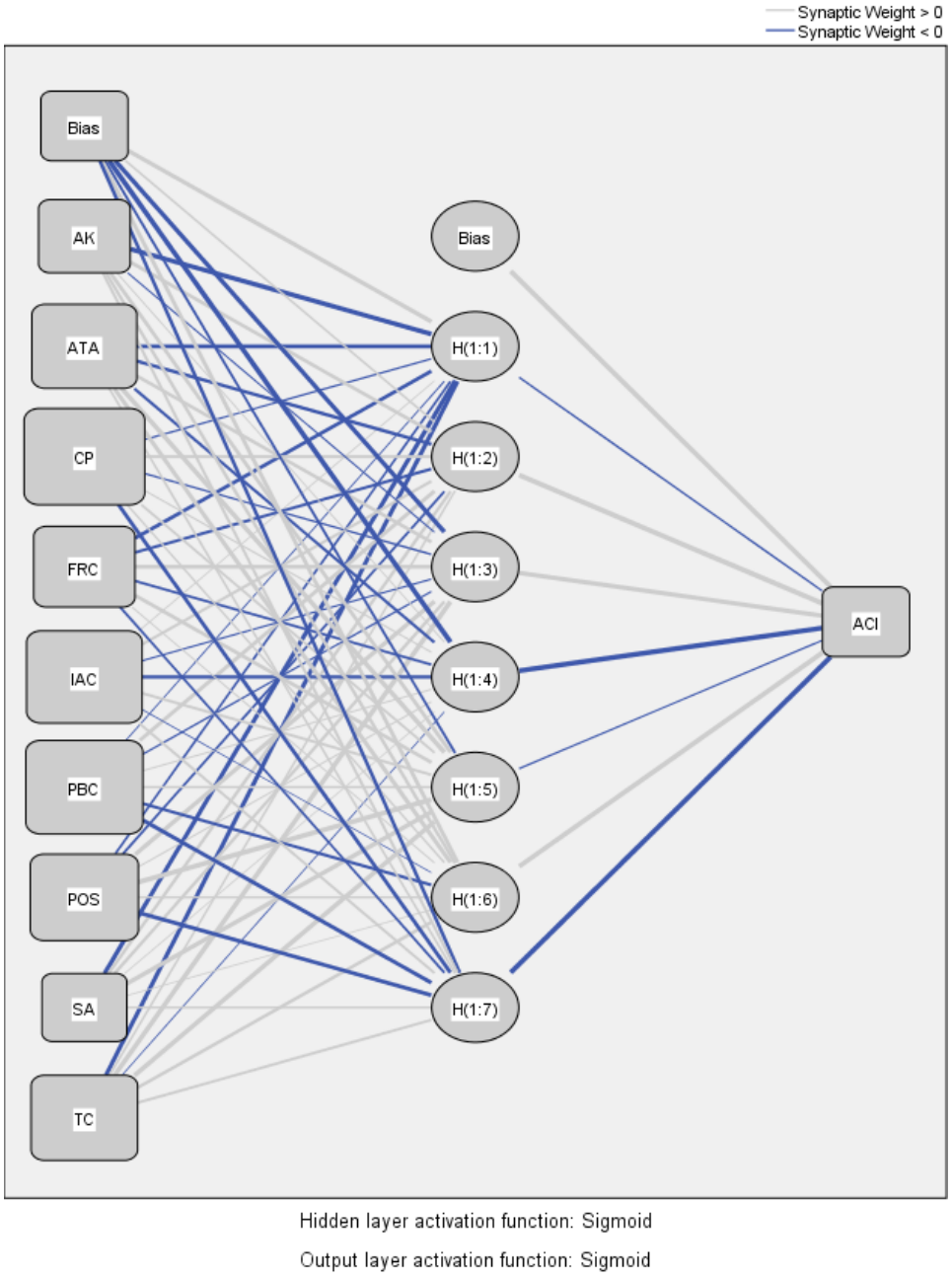

Figure 4

ANN architecture.

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- AppendixA.docx