The Influence of Students Development Strategy of the Faculty of Agriculture and Animal Science the University of Muhammadiyah Malang on the Future of Farmers Profession in Indonesia

Ary Bakhtiar[1,*], *Chairinina* Rizka Fitria[1], and *Waris* Ali Khan[2]

[1]Departement of Agribusiness, University of Muhammadiyah Malang, Jl. Raya Tlogomas No. 246, Malang 65144, East Java, Indonesia
[2]School of International Studies, Universiti Utara Malaysia, 06010 Sintok, Bukit Kayu Hitam, Kedah, Malaysia

Abstract. The young generation is an important part of becoming the nation's successor. The interest of the younger generation to the farming profession is still very minimal because the farming profession is considered less promising. This study aims to determine and analyze the influence of the student development strategy of the Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang on the future of the farmer profession in Indonesia. In this study, the authors used sampling with Slovin's formula, namely a sample of 105 respondents. Respondents in this study were active students of the 2019 FPP UMM class. The analytical tool used is multiple linear regression analysis with quantitative descriptive analysis approach and using SPSS Software Version 26. The results of this study can be concluded that X1, X2, X4 partially have no effect on the farmer profession, while for X3 it shows that it partially has an effect significant to the farming profession. The coefficient of determination of 0.469 means that the farmer profession variable can be explained by the student development strategy variable of 46.9 % while the remaining 53.1 % is explained by other independent variables not examined in this study.

Keywords: Agriculture sector, millennial farmers, young generation.

1 Introduction

Millennial farmers have high hopes as the next generation of elderly farmers in to advance the agricultural sector, but the crisis for young farmers can affect the productivity of the agricultural sector [1]. The younger generation has very little interest in being involved in the

* Corresponding author: arybakhtiar@umm.ac.id

farming profession [2]. It is important and necessary for the younger generation to learn about farming, so they can contribute to food production [3].

The proportion of young farmers who are still underestimated due to the loss of potential in several opportunities such as efficiency, competitiveness and innovation [4]. Several studies state that young female farmers are more dominant than young male farmers [5]. Data from the Ministry of Agriculture shows a decrease in the number of workers in the agricultural sector in 2017 to 2018 as much as 1 080 722 [6]. Several things are caused by the younger generation to be more open to the latest crops and technology, so that agricultural yields are high and profitable [7].

Success in the agricultural sector is easily achieved by the younger generation, but there is still a shortage of young farmers and this has an impact on the spread of knowledge or adoption of new knowledge so that it can threaten the agricultural sector [8]. Socialization and coaching for the younger generation in agriculture is an effort to grow and increase the interest, skills and entrepreneurial spirit of the younger generation in the agricultural sector [9].

Millennial farmers are farmers who are around 19 yr to 39 yr old [10]. The average age of farmers is on the rise and there is little prospect for younger generations to replace aging farmers, resulting in what is referred to as the "generation gap" in the agriculture and food sector [11]. The younger generation's lack of interest in agriculture and no interest in understanding how important it is to be involved in it [12]. In general, there are two categories of productive age, namely productive age aged 15 yr to 64 yr and unproductive age under 15 yr of age or over 65 yr of age. Young farmers can be expected as successors to farmers to advance the agricultural sector. Utilizing technology and computers will help the younger generation to be able to work in the agricultural sector, and will be beneficial for a country's economic development [13].

Agriculture contributes a lot in terms of markets, foreign exchange, output, capital transfer [14]. The need for food is an important part because life continues [15]. Agriculture is the main sector in terms of the economy and a source of life for many countries, but if a natural disaster occurs, flooding will result in large economic losses and have a very significant impact [16].

2 Research method

This research utilized the qualitative descriptive method. According to Jane Stokes, the method based on numerical information or quantity is typically associated with statistical analysis [17].

The research was conducted at the Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, from May to July 2022. The location was intentionally selected because it is one of the excellent faculties at the University.

The primary data obtained from the questionnaire results were processed in a quantitative descriptive manner and used to describe the data that had been collected. The respondent's data that has been obtained is then transferred and recapitulate in Microsoft Excel. The data recap was processed using SPSS 26 for Windows software, and the results of the processed data were tested for correlation using the multiple linear regression test. This research took 105 respondents to support the data and research results.

Primary data in the questionnaire was distributed using five categories called a Likert scale consisting of strongly agree, agree, doubt, disagree, and strongly disagree. The points of the Likert scale are 1, 2, 3, 4, and 5 questionnaires distributed through online media.

2.1 Sampling method

This research used the data source supported by primary data and secondary data. Primary data were obtained by disseminating questionnaires, while secondary data included the previous literature. The sampling technique applied purposive sampling, in which specific considerations must be met. Those criteria consisted of students at the Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang who are going to take a thesis course. The Slovin formula was applied to take the sample as in Equation (1) [18].

$$\mathbf{n} = \frac{\mathbf{N}}{\mathbf{1+Ne^2}} \tag{1}$$

n = Total sample
N = Population
e = Margin of the error to be decided by the researcher

3 Framework

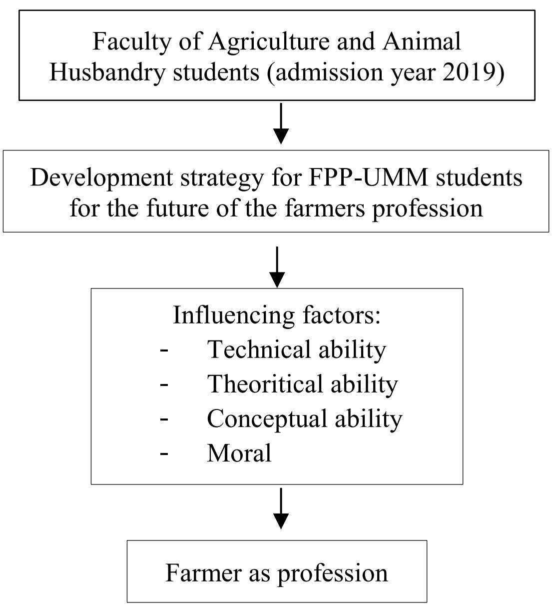

Fig. 1. Research framework.

4 Result and discussion

4.1 Identify of the respondents

The characteristics taken in this research (Table 1) consist of gender, the study program at the Faculty of Animal Science, and is aimed specifically at students from the class of 2019. The age range of students from the class of 2019 starts from 20 yr, so they have a mature mindset regarding their contribution in helping be a respondent in this research.

Table 1. Identify of the respondents.

Characteristics	Parameters	N = 105	Percentage (%)
Gender	Male	47	47.0
	Female	58	58.0
			100
Study program	Agribusiness	37	37.0
	Agrotechnology	20	20.0
	Aquaculture	15	15.0
	Animal science	9	9.0
	Forestry	7	7.0
	Food technology	17	17.0
			100
Admission year	2019		

The percentage of male and female respondents was 47 % and 58 % obtained from six different study programs students, namely Agribusiness, Agrotechnology, Aquaculture, Animal Science, Forestry, and Food Technology. These students will immediately take a thesis course.

4.2 Validity and reliability test

The validity test (Table 2) is how to explain the data that has been collected which includes the investigation carried out, then for reliability it concerns measuring a phenomenon so that it provides stable results [19].

Table 2. Validity and reliability test.

Variable	r_{count}	r_{table} 5 % (105)	Validity
Development strategy	0.448	0.191	Valid
Farming professions	0.805	0.191	Valid

Based on the questionnaire validity test of this research, there is a variable X (development strategy) which contains eight statement items, and it is said that each item is all valid. Variable Y (farmers profession) contained eight statement items, and all were declared valid. The reliability test of the X variable has a coefficient value of 0.448 and the Y variable has a coefficient value of 0.805. The results of both show that they are reliable or consistent because the value is > 0.191, so the X and Y variables can be used as research instruments.

4.3 Classic assumption test

4.3.1 Normality test

To find out whether the dependent variable data sample, namely the farmer profession, is normally distributed or not using statistical tests (Figure 2).

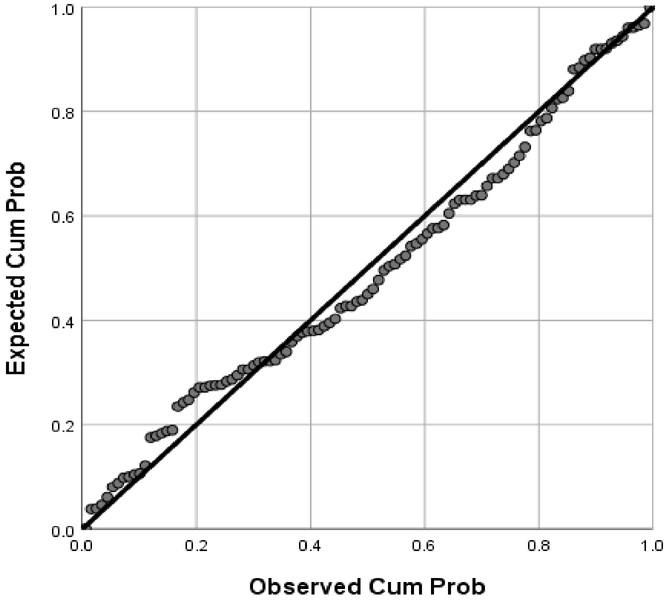

Fig. 2. Normality test.

Figure 2 shows the data distribution following the diagonal line, it can be said that the regression model is normally distributed.

4.3.2 Multicollinearity test

To determine the correlation of the independent variables, namely technical ability, theoretical ability, conceptual ability, and morals (Table 3).

Table 3. Result multicollinearity test.

Number	Model	Unstandardized coefficients		Standardized coefficients beta	t	Sig.	Colinearity statistics	
		B	Std. error				Tolerance	VIF
1	(Constant)	15.286	2.385		6.410	.000		
2	Technical ability	-.029	.057	-.039	-.505	.615	.895	1.118
3	Theoritical ability	-.533	.242	-.166	-2.205	.030	.939	1.065
4	Conceptual ability	1.807	.221	.632	8.193	.000	.892	1.112
5	Moral	.430	.239	.147	1.795	.076	.788	1.269

Coefficients[a]
a: dependent variabel: farming profession.

From Table 3, if the tolerance value is > 0.100 and the VIF value is < 10.00, there is no multicollinearity. Variable X1 that is technical ability = 0.895 > 0.100 and VIF 1.118 < 10.00 means that there is no multicollinearity. Variable X2 that is theoretical ability = 0.939 > 0.100 and VIF 1.065 < 10.00 it is said that there is no multicollinearity. Variable X3 that is conceptual ability = 0.892 > 0.100 and VIF 1.112 < 10.00 it is said that multicollinearity does not occur. Variable X4 that is conceptual ability = 0.788 > 0.100 and VIF 1.269 < 10.00 it is said that multicollinearity does not occur. So, that there are no symptoms of correlation between variables.

4.3.3 Heteroscedasticity test

The heteroscedasticity test (Figure 3) is usually depicted and explained using graphical methods [20].

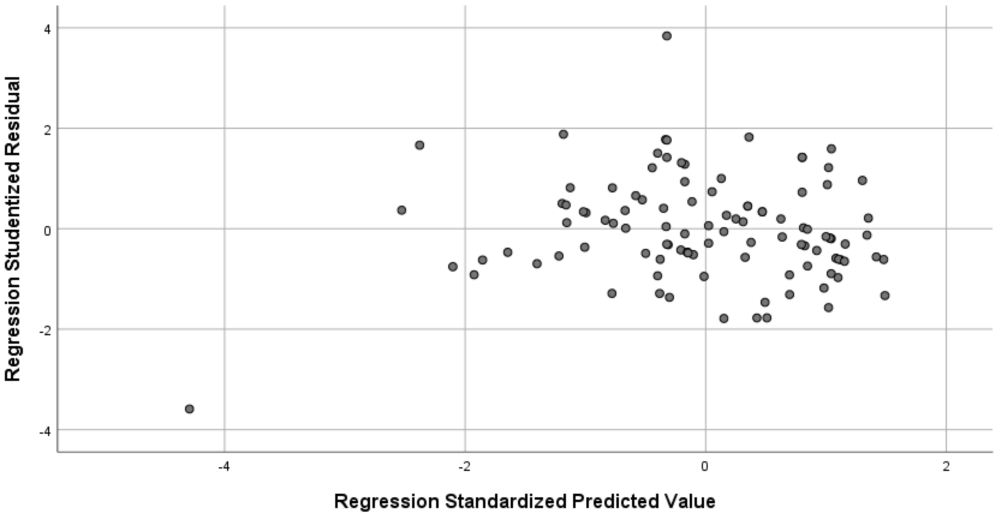

Fig. 3. Heteroscedasticity test

In the Scatterplot test above (Figure 3), the regression model is concluded to be free from heteroscedasticity because the randomly distributed points do not form a clear pattern.

4.4 Multiple linear regression analysis test

Multiple linear regression (Table 4) is usually used to determine whether or not there is a significant influence of two or more independent variables on the dependent variable.

Table 4. Multiple linear regression analysis test.

Number	Model	Unstandardized coefficients		Standardized coefficients beta	t	Sig.	Colinearity statistics	
		B	Std. error				Tolerance	VIF
1	(Constant)	15.286	2.385		6.410	.000		
2	Technical ability	-.029	.057	-.039	-.505	.615	.895	1.118
3	Theoritical ability	-.533	.242	-.166	-2.205	.030	.939	1.065
4	Conceptual ability	1.807	.221	.632	8.193	.000	.892	1.112
5	Moral	.430	.239	.147	1.795	.076	.788	1.269

Coefficients[a]
a: dependent variabel: farming profession.

From Table 4 the form of the multiple linear regression equation is described in Equation (2).

$$Y = 15.286 + (-0.029)X1 + (-0.533)X2 + (1.807)X3 + (0.430)X4 \quad (2)$$

4.5 Simultant test

The simultaneous test (Table 5) is a test used to see the independent influence on the dependent variable. The table below is the result of the simultaneous test.

Table 5. ANOVA.

Number	Model	Sum of square	df	Mean square	F	Sig.
1	Regression	751.438	4	187.859	22.111	.000[b]
2	Residual	849.610	100	8.496		
Total		1 601.048	104			

Anova[a]
a: dependant variable: farming profession
b: predictors: (constant), moral, theoritical ability, technical ability, conceptual ability

From Table 5, the value of $f_{count} > f_{table}$ means that the variable X simultaneously affects the variable Y. $f_{table} = 2.46$. The F value is 22.111 > 2.46, so X1, X2, X3, X4 simultaneously affect the farmer's profession (variable Y).

4.6 Partial test

This partial test (Table 6) aims to see the influence of the independent variable partially on the dependent variable. The table below shows the results of the t test (partial).

Table 6. Coefficients.

Number	Model	Unstandardized coefficients		Standardized coefficients beta	t	Sig.	Colinearity statistics	
		B	Std. error				Tolerance	VIF
1	(Constant)	15.286	2.385		6.410	.000		
2	Technical ability	-.029	.057	-.039	-.505	.615	.895	1.118
3	Theoritical ability	-.533	.242	-.166	-2.205	.030	.939	1.065
4	Conceptual ability	1.807	.221	.632	8.193	.000	.892	1.112
5	Moral	.430	.239	.147	1.795	.076	.788	1.269

Coefficients[a]
a: dependent variabel: farming profession.

From Table 6, the result of partial test is: (i) Partially influence of technical ability on farmer profession**.** Variable technical ability value $t_{count} < t_{table}$ is -.505 < 1.983 then based on data testing criteria it can be seen that H0 is accepted, and Ha is rejected, meaning that technical ability has no significant effect on the farmer profession, (ii) Partial effect of theoretical ability on the farmer profession. Theoretical ability variable with $t_{count} < t_{table}$ is -2.205 < 1.983, so based on the data testing criteria it can be seen that H0 is accepted, and Ha is rejected, meaning that theoretical ability has no significant effect on the farmer profession, (iii) Partial influence of conceptual ability on the farmer profession. Variable conceptual ability value $t_{count} > t_{table}$ that is 8.193 > 1.983 then based on data testing criteria it can be seen that H0 is rejected, and Ha is accepted meaning that conceptual ability has a significant effect on the farmer profession, (iv) Partial moral effect on farmer profession. Moral variable value $t_{count} > t_{table}$ that is 1.795 > 1.983 then based on the data testing criteria it can be seen that H0 is accepted, and Ha is rejected, meaning that moral has no significant effect on the farmer profession.

4.7 Correlation coefficient and coefficient of determination

This model summary table aims to see the R^2 results in order to find out the percentage of the independent variables, as shown in Table 7.

Table 7. Model Summary.

Model	R	R-square	Adjusted R square	Std. error of the estimate	Durbin-Watson
1	.685[a]	.469	.448	2.91481	1.928

Model summary[b]
a: preditors: (constant), moral, theoritical ability, technical ability, conceptual ability.
b: dependent variable: farming profession.

From Table 7, the R^2 value of 0.469 means that the variables X1, X2, X3, X4 in a percentage count of 46.9 % while the remaining 53.1 % is associated with other independent variables not examined in this study.

5 Conclusion and suggestion

5.1 Conclusion

The development strategy consists of technical abilities, theoretical abilities, conceptual abilities, and morals that have a simultaneous effect on the future of the farmer profession in Indonesia. Each factor consists of X1, X2, X3, X4 showing an R^2 value of 0.469 in a percentage count of 46.9 %.

5.2 Suggestion

The factors involved in the development strategy can be understood by students and also for agencies to be useful for advancing the profession of young farmers in Indonesia. The Faculty of Agriculture-Animal Science University of Muhammadiyah Malang can support their students to instill the desire to work as young farmers who are the successors of the nation.

References

1. B.M.N. Hak, *Persepsi dan minat pemuda desa menjadi petani di desa Jatikerto Kecamatan Kromengan Kabupaten Malang.* [Perception and Interest of Village Youth to be Farmers in Jatikerto Village Kromengan Subdistrict Malang Regency] [Undergraduate Thesis] Fakultas Pertanian, Universitas Brawijaya (2018) [in Bahasa Indonesia] p.70. http://repository.ub.ac.id/id/eprint/161999/
2. R. Bhutiani, F. Ahamad, A case study on changing pattern of agriculture and related factors at Najibabad region of Bijnor, India. In: *Contaminants in Agriculture and Environment: Health Risks and Remediation*. V. Kumar, R. Kumar, J. Singh, P. Kumar (Eds). Agro Environ Media, India (2019).p.236–249 https://doi.org/10.26832/AESA-2019-CAE-0158-018
3. A.C. Agumagu, C.C. Ifeanyi-obi, C. Agu, *Perception of Agriculture Students Towards Farming as a Means of Sustainable Livelihood in Rivers State, Nigeria*. Proceedings of the annual conference of the agricultural extension society of Nigeria (River State, Nigeria, 2017) Twenty-Second Annual Conference **22**,1: 108–116 https://doi.org/10.4314/jae.v22i1.12S

4. D. May, S. Arancibia, K. Behrendt, J. Adams, Land Use Policy, **82**: 317–327 (2019) https://doi.org/10.1016/j.landusepol.2018.12.019
5. I. Unay-Gailhard, Š. Bojnec, J. Rural Stud., **88**: 71–82 (2021) https://doi.org/10.1016/j.jrurstud.2021.09.027
6. H.M. Qudrotulloh, E. Sumarsih, H. Nuryaman, N.R. Mutiarasari, T. Hardiyanto, Agritekh, **2**,2: 124–135 (2022) [in Bahasa Indonesia] https://jurnal.masoemuniversity.ac.id/index.php/agribisnisteknologi/
7. F.O. Afande, W.N. Maina, F.M.P. Maina, J. Cult. Soc. Dev., **7**: 4–20 (2015) https://www.iiste.org/Journals/index.php/JCSD/article/view/22759
8. D.G. Papadopoulou, A. Papadaki-Klavdianou, A. Michailidis, M. Partalidou, Asian J. Agric. Rural Dev., **9**,2: 147–163 (2019) https://doi.org/10.18488/journal.1005/2019.9.2/1005.2.147.163
9. I. Junais, S. Samsuar, D. Daniel, H.M. Ali, Y. Yusran, A. Syarif, et al., IOP Conf. Ser.: Earth Environ. Sci., **473**,012017: 1–9 (2020) https://doi.org/10.1088/1755-1315/473/1/012017
10. A. Novisma, E. Iskandar, IOP Conf. Ser.: Earth Environ. Sci., **1183**,012112: 1–6 (2023) https://doi.org/10.1088/1755-1315/1183/1/012112
11. Y. Fiedler, *Empowering young agri-entrepreneurs to invest in agriculture and food systems*. Rome, Food and Agriculture Organization (2020). p.66 https://doi.org/10.4060/cb1124en
12. S. Kidwai, Tech. Connect Educ. Careers, **86**,5: 32–34 (2011) https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ925288&site=ehost-live
13. C.I Lin, J. Sci. Commun., **21**,2: 1–15 (2022) https://doi.org/10.22323/2.21020202
14. D.S. Ugwu, I.O Kanu, J. Afr. Stud. Dev., **4**,2: 51–59 (2012) https://doi.org/10.5897/JASD11.029
15. A.R.L. Sa'adah, H. Herman, F. Hamdalah, J. Ekonomi Bisnis, **21**,1: 88–99 (2022) [in Bahasa Indonesia] https://doi.org/10.32722/eb.v21i1.4573
16. F.N. Nnadi, J. Chikaire, J.A. Echetama, R.A. Ihenacho, P.C. Umunnakwe, C.O. Utazi, Net J. Agric. Sci., **1**,1: 1–9 (2013) https://www.netjournals.org/z_NJAS_13_020.html
17. F.I. Busti, Communique: J. Ilmiah Ilmu Komunikasi, **2**,1: 48–55 (2019) [in Bahasa Indonesia] http://ejurnal.stikpmedan.ac.id/index.php/JIKQ/article/view/27
18. F.B.T. Isip, *Position Paper Encouraging the use of Slovii's Formula in computing sample sizes in DMS survey related projects* [Online] from https://www.academia.edu/8664340/P_O_S_I_T_I_O_N_P_A_P_E_R_ISIP_Position_Paper_Encouraging_the_use_of_Slovins_Formula_in_computing_sample_sizes_in_DMS_survey_related_projects (2021)
19. H. Taherdoost, Int. J. Acad. Res. Manag., **5**,3: 28–36 (2016) https://doi.org/10.2139/ssrn.3205040
20. E. Alih, H.C. Ong, J. Appl. Stat., **42**,8: 1617–1634 (2015) https://doi.org/10.1080/02664763.2015.1004623