

Information Technology Utilization of Young Educated Farmers in Agricultural Entrepreneurship

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ABSTRACT

Information technology can help farmers develop their farming, but its utilization is still very low for farmers. This study aims to reveal the personal characteristics of educated young farmers, their entrepreneurial characteristics, their behaviour in using information technology, and their obstacles in utilizing it. This research is a descriptive exploratory with a quantitative approach. The data collection technique used a questionnaire on 124 Yogyakarta-Magelang Agricultural Development Polytechnic students in March-June 2019. The data was collected using the census method. The results revealed that educated young farmers prefer entrepreneurial cultivation. Meanwhile, the behaviour of utilizing information technology was moderate. Information technology was used to expand the market scope and seek information. Cultivation and market opportunities were the most needed information for young farmers. The obstacles faced consisted of internal group problems and insufficient time to integrate their business activities with information technology. Business assistance and information technology can help strengthen young farmer groups' management in agricultural entrepreneurship.

Keywords: agricultural entrepreneurship, information technology, young farmer

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INTRODUCTION

Farmer regeneration is a serious problem in the development of agriculture in Indonesia. The low number of youth who become farmers indicates the decline of youth interest in pursuing agricultural business, only

8.78% of farmers under 35 years of age (BPS, 2018). Furthermore, as the level of education in Indonesia increases, young people's interest in agriculture has decreased. This farmer regeneration crisis could threaten food security, as pointed out in the research

of (Arvianti et al. 2019; Widiyanti et al. 2020).

The Ministry of Agriculture continues to carry out programs that encourage youth to be involved in the agricultural sector. One of the farmer regeneration programs is the Young Agricultural Entrepreneurial Growth (Penumbuhan Wirausahawan Muda Pertanian/PWMP). It provides group-based agricultural venture capital to the Agricultural Development Polytechnic and the Faculty of Agriculture students. The use of the capital grant of IDR15,000,000 will be monitored and evaluated by the Agricultural Human Resources Development Agency through the Agricultural Education Center. Similar activities aimed to encourage the youth to become a farmer were also carried out in various countries such as Africa (Agumagu et al., 2018), America, and Europe (Zagata & Sutherland, 2015; May et al., 2019; Balezentis et al., 2020).

The PWMP program has been running since 2016 at the Yogyakarta-Magelang Agricultural Development Polytechnic. However, entrepreneurial activities coupled with learning activities face various problems. Appropriate efforts and steps are needed to overcome the problem of limited time in dealing with this entrepreneurship. This problem is also revealed in Sugiarta et al. (2020) research that time is an obstacle in carrying out entrepreneurial activities. Information technology can be an alternative that helps farmers in agricultural entrepreneurship (Anwarudin et al., 2019; Silva et al.,

2017; Lokeswari, 2016). Students who are part of the digital generation need to optimize the use of information technology to develop their businesses. Several entrepreneurial experiences in the millennial generation state that information technology is indispensable in managing a business (Milone & Ventura, 2019).

Farmers use the internet to get information and find new opportunities (Park, 2017). According to Subejo et al (2018), what farmers need the most is information related to the cultivation, and then followed by processing agricultural products. Furthermore, based on FAO (2014) research, young potato farmers experienced profit improvement after utilizing information technology because the potato could be marketed to the consumers directly. Youth can connect to the market with a higher price Prayoga et al. (2019) stated that young farmers could overcome marketing problem by using social media platform. Information technology can provide opportunities for agricultural entrepreneurship development. FAO (2017) states that information technology in agriculture can increase market access, increase food security, facilitate access to capital, and facilitate policies. Various agricultural applications have emerged along with the development of information technology transformation in agriculture, ranging from cultivation (land preparation, planting, and

harvesting), post-harvest to marketing through e-commerce and social media features. The added value of agricultural products and business marketing activities in agriculture is expected to increase farmers' income.

The use of information technology for young farmers is very suitable because they are digital natives. Digital natives are young people who were born when the internet has become a part of their lives. On the other hand, PWMP activities have not emphasized the use of technology. Business activities are not partnered with e-commerce. Educated farmers are not trained to make product content in marketing their agricultural products. Assistance and debriefing are only limited to funding and business management. The management of business activities also lacks in the use of information technology, which is still the same as that of farmers in general. Educated farmers still rely on direct sales and only use information technology in a limited space.

This study seeks to analyze the use of information technology in PWMP activities which include: personal characteristics of educated young farmers, their entrepreneurial characteristics, their behaviour on information technology utilization, their benefits, and the constraints faced by educated young farmers in utilizing information technology to support agricultural entrepreneurship. This research is expected to provide input for the development of PWMP so that the integration of agriculture and

information technology can produce educated young farmers who are creative and innovative as the next generation of agricultural development in Indonesia.

METHOD

This research was a descriptive exploratory with a quantitative approach, data collection techniques using structured and open questionnaires, observations, literature studies, and documentation. The research was conducted at the Yogyakarta Agricultural Development Polytechnic in March-June 2019. This university became the research location because it conducted a farmer regeneration program called PWMP. Respondents were selected using the census method, meaning that all PWMP participants who were involved in entrepreneurship for three years became respondents in this study. The criteria for respondents were: 124 students who have participated in the PWMP program for three years. The variables used a 5-score rating scale consisting of (1) Very Unsuitable, (2) Unsuitable, (3) Doubtful, (4) Suitable, (5) Very Suitable. Age was measured by years. Percentages and average scores were used to analyze the personal characteristics of young educated farmers. The influence of entrepreneurial behaviour and utilizing new media on business success was measured by multiple regression analysis—correlation at $p \leq 0.05$.

RESULTS AND DISCUSSION

Characteristics of Young Educated Farmers

Educated young farmers are expected to be the next generation in agricultural development in Indonesia. The government's efforts are to strengthen agricultural vocational education and provide capital to these young farmers.

Table 1 shows that the number of educated female students (53%) involved in agricultural entrepreneurship was more than male students (47%). Access to education has opened agricultural business opportunities for women. Technological developments make it easier for women to be involved in agriculture. Furthermore, their average age was 21 years. This productive age, if utilized properly, will increase the role of agriculture in development.

Table 1: Characteristics of Young Educated Farmers

Variable	Total n = 124	%
Gender		
Man	53	43
Women	71	57
Age (years)		
20	46	37
21	66	53
22	11	9
23	1	1
Parents' job		
Farmer	71	58
Civil servants	16	13
Non-Agripreneur	13	10
Private employees	12	10
Labor	6	4.5
Traders	6	4.5

Source: Primary Data Analysis (2019)

The majority of educated young farmers was from parents who also work as farmers (58%). This trend occurs in many countries as research Wiyono (2015) stated that parents' role influences their children's choice to become farmers. With the improvement of the quality of education and experience of this PWMP, it is expected that the next generation of young people could implement modern entrepreneurship-based agriculture.

Characteristics of Agricultural Entrepreneurs

Based on Table 2, the majority of educated young farmers (63%) chose to do business by planting or cultivating. Most of them preferred horticulture because it harvests faster and is more profitable than food crops. Based on field observations, students chose cultivation because there was land available on campus. There had been markets for sales already targeting the employees and the academic community on campus, office complexes, and surrounding housing.

Meanwhile, young farmers chose this type of business because of profitable market opportunities (38%). They believe that agricultural products are more marketable than other businesses. Based on field observations, apart from being sold to employees and offices around campus, young farmers also take advantage of social media.

Table 2. Characteristics of Agricultural Entrepreneurs

Variable	Total n=124	%
Type of business		
On-farm	78	63
Processed	42	34
Marketing	4	3
Reasons for choosing this business		
Tried but failed	3	2
Lecturer directions	3	2
Good selling price	6	5
Group agreement	8	6
Needs	3	2
New/unique	11	9
Easy/practical	28	23
Market opportunity	46	38
Like/passion	12	10
Long-lasting product	4	3

Source: Primary data analysis (2019)

The second reason is convenient or practical (23%) because they are still busy with class schedules and assignments.

Information Technology Utilization Behavior for Entrepreneurs

This study covered some aspects such as the duration and frequency of young farmers accessing the internet in a day, and the cost required to buy internet credit in a month.

Based on Table 3 below, 50% of young farmers accessed the internet for about 2-6 hours a day. The use of the internet among these young farmers was lower than the average internet usage in Indonesia, 7 hours 59 minutes

Table 3 Utilization of Information Technology in Agricultural Business

Variable	Total	%	Category
Access time (hours/day)			
<2	22	17	Less
2-6	64	50	Moderate
> 6	38	33	Long
Access frequency (times/day)			
<10	34	27	Less
> 10-20	66	54	Moderate
> 20	24	19	Often
Cost required (IDR / month)			
<50,000	25	20	Low
> 50,000-			
100,000	83	67	Moderate
> 100,000	16	13	High

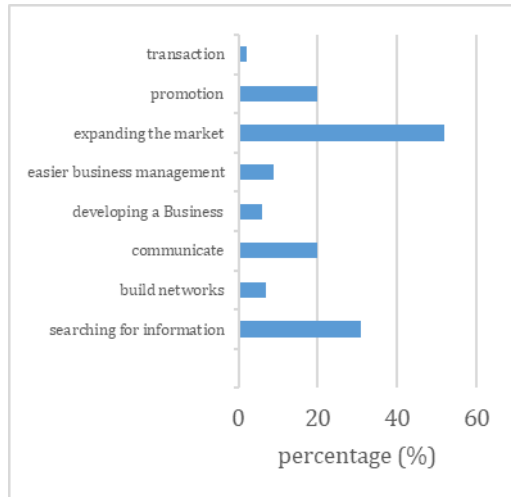
Source: Primary data analysis (2019)

Note ICT utilization in the last three months—categories based on the normal distribution in three scales.

(We Are Social, 2020). Regarding the frequency of use, in a day, 54% of young farmers used the internet to support agricultural business about 10-20 times, while the cost to buy internet quota needed for a month was approximately between IDR50,000 and IDR100,000.

Utilization of Information Technology for Entrepreneurs

The use of information technology can help entrepreneurial activities. Farmers use the internet to search for information, communicate, and make transactions. Based on the descriptive data collected, the internet's role for educated young farmers is shown in Figure 1.



Y= The internet's role for educated young farmers

Figure 1. Utilization of the internet for entrepreneurs

Source: Primary data analysis (2019)

Young farmers used the internet for expanding market reach (52%), for finding information (31%), for communicating and promoting (20%), for facilitating business management (9%), for building networks (7%), for developing business (6%), and for transactions (2%). In this case, respondents could respond to more than one answers. It is shown that marketing is the biggest problem for young farmers. Social media is one type of application that helps young farmers market their agricultural products. These young farmers usually offer them through WhatsApp groups and are assisted by lecturers and other friends. The WhatsApp application as a medium for communicating with buyers is also found in the research of Nurlaela et al. (2020). In addition, in campus,

there is also a place to market their products located on the side of the main road, enabling young farmers to sell their agricultural products. The convenience of utilizing new media in helping with marketing was also conveyed by Singh (2019).

Internet media is a means of finding information easily, quickly, and thoroughly. The right information in agricultural entrepreneurship will help farmers in making the right decisions as well. The importance of information for educated young farmers in entrepreneurship is also emphasized in the research of Yunandar et al. (2019), which states that the right information shapes the positive attitude of young farmers towards agricultural entrepreneurship. Farmers need information in conducting agricultural cultivation. According to Arifianto (2016), the information needed by farmers is sequential: 1) superior plant seeds, 2) making nurseries, 3) soil processing, 4) planting superior seeds, 5) maintenance during the production process, 6) types of fertilizers and medicines pest control, 7) agricultural production processing, 8) market prices for agricultural products and 9) distribution of agricultural products. There is a difference between the needs of educated young farmers and farmers in general. For young farmers, marketing needs are essential to be solved through new media rather than cultivation information.

Meanwhile, the use of the internet for promotion and

communication was 20%. The internet's role, especially social media, is vital in promoting, as Prayoga et al (2019) researched. However, educated young farmers were still not massively proficient in using social media for promotion which was caused by their lack of skills and expertise. They need assistance, cooperation, and collaboration with other parties who control media content and management. Furthermore, in terms of seeking information, young farmers often seek information about farming or cultivation (32%) including land cultivation, fertilization, maintenance, and harvesting, then market information (29%), prices (20%) and information about agricultural product processing. (19%).

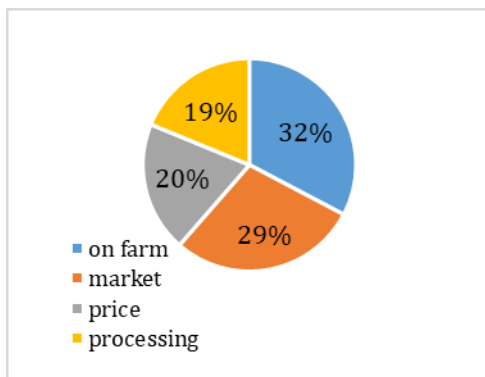


Figure 2. Types of information accessed by young educated farmers

Source: Primary data analysis (2019)

The ability to filter and utilize this information is essential to make decisions so that young farmers can be

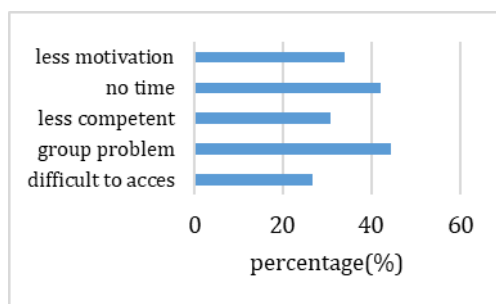
successful in managing their farms. The amount of information presented requires the ability to sort and select information appropriately. This ability is known as information literacy. According to Raya et al. (2018) information literacy can effectively and efficiently access needed information, evaluate information, criticize information sources, and use information effectively to achieve specific goals.

Young Educated Farmer Problems in Utilizing Information and Communications Technology

Low human resource capacity is a problem in the use of information technology. Age, education level, and inadequate facilities become obstacles in utilizing information technology. Based on Arifianto's research (2016), farmers' problems in utilizing information technology are: unevenly distributed ICT (Information and Communication Technologies) infrastructure, low human resources for farmers, lack of understanding, low public trust in ICT, hampered farmers regeneration, funds insufficiency in accessing ICT.

While the problem of using information technology for educated farmers is shown in Figure 3, this problem is related to the PWMP entrepreneurship dynamics with a direct grant-giving model without competition so that students who do

not have entrepreneurial skills can obtain capital. The attempt was carried out on a group with very little assistance. Group dynamics and management are essential issues in entrepreneurship. Groups need clear leadership, vision, and goal. The role of groups can be a determinant of the success of an agricultural business as researched (Hariadi, 2011; Nurlaela et al., 2020; Tran et al., 2018; Kamil et al., 2017), especially in terms of utilization information technology (CK & G, 2016).



Y= Problems in the Use of Information Technology for Educated Farmers (%)

Figure 3. Problems in the Use of Information Technology for Educated Farmers

Source: Primary data analysis (2019)

Figure 3 shows that the most significant problems were internal group problems (44.35%), lack of time to manage a business by utilizing ICT (41.94%), and low motivation to promote business by utilizing ICT. Meanwhile, the lack of business assistance by utilizing information technology was still an obstacle for educated young farmers. They did not master the use of ICT

(30.65%) and have difficulty accessing it (26.61%) due to network and cost factors. In this case, respondents could respond more than one answers.

CONCLUSION AND SUGGESTION

Educated young farmers preferred entrepreneurial cultivation because of market certainty consideration. Meanwhile, the behaviour of using technology among young farmers was moderate. Most young educated farmers used information technology to expand market reach and find information. Information that is often sought after were cultivation and market opportunities. The obstacles faced in utilizing information technology are internal group problems and insufficient time to integrate business activities with information technology.

It is expected that the accompanying lecturers of PWMP will have the capacity to assist entrepreneurs, know group problems, and try to help develop group businesses. The government expect that the PWMP program will integrate agricultural businesses by utilizing information technology so that time constraints as an obstacle in managing a business can be minimized. We hope that educated young farmers might get motivated by seeing the success of other young farmers.

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