

MOTIVATION AND TECHNOLOGY EXPOSURE AS DETERMINANTS OF HIGH SCHOOL STUDENTS' INTEREST IN AGRICULTURE: EVIDENCE FROM INDONESIA

MOTIVASI DAN PAPARAN TEKNOLOGI SEBAGAI DETERMINAN MINAT SISWA SEKOLAH MENENGAH ATAS TERHADAP PERTANIAN: BUKTI DARI INDONESIA

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ABSTRACT

The declining interest of young generations in agriculture has become a serious challenge to the sustainability of the agricultural sector, particularly in developing countries. This study aims to analyze the influence of motivation and technology exposure on high school students' interest in agriculture. A quantitative research approach was employed using primary data collected through a structured questionnaire administered to 101 senior high school students in Bekasi Regency, Indonesia. The data were analyzed using multiple linear regression, supported by validity, reliability, and classical assumption tests. The results indicate that motivation has a positive and significant effect on students' interest in agriculture, while technology exposure also shows a significant influence, although to a lesser extent. Simultaneously, motivation and technology exposure significantly affect students' agricultural interest. These findings suggest that psychological factors and technological familiarity play an important role in shaping youth perceptions and interest toward agricultural careers. This study contributes empirical evidence on youth engagement in agriculture from an emerging agricultural region and highlights the importance of integrating motivational strategies and technology-based learning into agricultural education. The findings provide practical implications for educators, policymakers, and educational institutions in designing programs aimed at attracting younger generations to the agricultural sector.

Keywords: *youth interest, agriculture, motivation, technology exposure, agricultural education*

ABSTRAK

Menurunnya minat generasi muda terhadap sektor pertanian telah menjadi tantangan serius bagi keberlanjutan sektor pertanian, khususnya di negara-negara berkembang. Penelitian ini bertujuan untuk menganalisis pengaruh motivasi dan paparan teknologi terhadap minat siswa sekolah menengah atas terhadap pertanian. Pendekatan penelitian kuantitatif digunakan dengan memanfaatkan data primer yang dikumpulkan melalui kuesioner terstruktur kepada 101 siswa sekolah menengah atas di Kabupaten Bekasi, Indonesia. Data dianalisis menggunakan regresi linier berganda yang didukung oleh uji validitas, reliabilitas, dan uji asumsi klasik. Hasil penelitian menunjukkan bahwa motivasi berpengaruh positif dan signifikan terhadap minat siswa pada bidang pertanian, sementara paparan teknologi juga menunjukkan pengaruh yang signifikan meskipun dengan tingkat pengaruh yang lebih kecil. Secara simultan, motivasi dan paparan teknologi berpengaruh signifikan terhadap minat siswa terhadap pertanian. Temuan ini mengindikasikan bahwa faktor psikologis dan familiaritas terhadap teknologi memainkan peran penting dalam membentuk persepsi dan minat generasi muda terhadap karier di bidang pertanian. Penelitian ini memberikan bukti empiris mengenai keterlibatan generasi muda dalam pertanian dari wilayah pertanian yang sedang berkembang serta menekankan pentingnya integrasi strategi motivasional dan pembelajaran berbasis teknologi dalam pendidikan pertanian. Hasil penelitian ini memberikan implikasi praktis bagi pendidik, pembuat kebijakan, dan institusi pendidikan dalam merancang program yang bertujuan untuk menarik generasi muda ke sektor pertanian.

Kata kunci: *minat generasi muda, pertanian, motivasi, paparan teknologi, pendidikan pertanian*

1. INTRODUCTION

The agricultural sector plays a crucial role in ensuring food security, economic stability, and rural development. Agriculture remains a primary source of livelihood for rural populations and contributes significantly to national economies, particularly in developing countries. However, many countries are currently facing a serious challenge related to the declining participation of young generations in agriculture. The phenomenon of farmer aging and youth disengagement has raised growing concerns regarding the long-term sustainability of agricultural systems, as fewer young people are willing to pursue agricultural careers despite increasing demands for food and innovation in the sector (Food and Agriculture Organization of the United Nations, 2018; White, 2012; Leavy & Smith, 2010).

One of the main factors contributing to the decreasing interest of young people in agriculture is the negative perception of agricultural careers. Agriculture is often viewed as labor-intensive, low-income, and lacking social prestige, making it less attractive compared to employment opportunities in urban and industrial sectors. As a result, many students prefer careers outside agriculture, despite the sector's increasing need for innovation and skilled human resources (Sumberg et al., 2012; Anyidoho et al., 2012; Proctor & Lucchesi, 2012; Food and Agriculture Organization of the United Nations, 2018).

Previous studies have shown that individual motivation plays a key role in shaping career interests and decision-making processes. Motivation influences how students perceive certain fields of study and professions, including agriculture. Students with higher levels of intrinsic and extrinsic motivation are more likely to explore and consider agricultural careers, particularly when they perceive agriculture as meaningful, rewarding, and aligned with their personal goals (Akpan et al., 2020).

In addition to motivation, technological development has significantly transformed the agricultural sector and introduced new opportunities that may attract younger generations. The integration of technology in agriculture such as digital farming, smart agriculture, and information-based agricultural systems has the potential to reshape traditional perceptions of agriculture from a labor-intensive occupation into a modern, innovative, and knowledge-driven sector (Wolfert et al., 2017; Rose & Chilvers, 2018; Klerkx et al., 2019). Exposure to agricultural technology can increase students' interest by presenting agriculture as a future-oriented field that requires creativity, technological competence, and problem-solving skills.

Although a growing number of studies have examined youth interest in agriculture, empirical research that simultaneously analyzes motivational and technological factors remains limited, particularly in developing regions. Most existing studies tend to focus either on psychological determinants such as motivation or on technological and structural aspects in isolation, leaving a gap in understanding how these factors interact in shaping students' interest in agriculture (Anyidoho et al., 2012; Akpan et al., 2020).

Therefore, this study aims to analyze the influence of motivation and technology exposure on high school students' interest in agriculture. By providing empirical evidence from an emerging agricultural region in Indonesia, this study contributes to the literature on agricultural education and youth engagement. The findings are expected to offer practical insights for educators and policymakers in designing educational strategies and programs that encourage youth participation in the agricultural sector (Food and Agriculture Organization of the United Nations, 2018).

2. LITERATURE REVIEW

2.1 Youth Interest in Agriculture

Youth interest in agriculture refers to the willingness and inclination of young individuals to engage in agricultural activities, education, or careers. Interest plays a crucial role in shaping students' career choices and long-term professional commitments. However, numerous studies conducted after 2010 report a declining level of youth interest in agriculture, particularly among secondary-school students (Sumberg et al., 2012; Anyidoho et al., 2012). This decline is closely associated with perceptions of agriculture as physically demanding, economically less attractive, and socially undervalued.

Several studies highlight that students' interest in agriculture is influenced by both internal and external factors. Internal factors include motivation, attitudes, and personal values, while external factors encompass family background, educational exposure, and broader societal perceptions (Anyidoho et al., 2012; Akpan et al., 2020). When agriculture is introduced solely as traditional farming without emphasizing innovation and technological advancement, students tend to develop indifferent or negative attitudes toward the sector.

2.2 Motivation and Students' Interest in Agriculture

Motivation is a key psychological factor influencing individuals' educational and career-related decisions. In the context of career selection, motivation shapes how students interpret learning experiences and evaluate potential professions (Lent et al., 2014). Students with stronger intrinsic motivation such as personal interest and enjoyment and extrinsic motivation such as expected income and job security—are more likely to explore and consider agricultural careers (Ryan & Deci, 2017).

Recent empirical studies indicate that motivated students are more open to agriculture when they perceive it as meaningful, socially valuable, and aligned with their personal aspirations (Akpan et al., 2020; Ndofirepi et al., 2021). Conversely, low motivation is associated with disengagement from agricultural subjects and a stronger preference for non-agricultural careers. These findings underline motivation as a critical determinant of youth interest in agriculture.

2.3 Technology Exposure in Agriculture

Technological advancement has transformed agriculture into a more efficient, innovative, and data-driven sector. Developments such as digital agriculture, precision farming, and smart farming systems have significantly altered agricultural practices and career opportunities (Wolfert et al., 2017; Klerkx et al., 2019). Technology exposure refers to students' familiarity and interaction with these technologies through education, media, or practical experience.

Studies suggest that exposure to agricultural technology positively influences students' perceptions by framing agriculture as a modern and progressive sector rather than purely manual labor (Rose & Chilvers, 2018). Technology-based learning has been shown to enhance students' engagement, creativity, and interest in agricultural careers, particularly among younger generations who are already accustomed to digital environments (Akpan et al., 2020). Therefore, technology exposure is expected to play an important role in increasing students' interest in agriculture.

2.4 Conceptual Framework and Research Hypotheses

Based on the literature, students' interest in agriculture is influenced by both psychological and technological factors. Motivation affects students' internal drive and willingness to engage with agriculture, while technology exposure shapes their perceptions of agriculture as a modern and viable career option.

Accordingly, this study proposes the following hypotheses:

H1: Motivation has a positive and significant effect on high school students' interest in agriculture.

H2: Technology exposure has a positive and significant effect on high school students' interest in agriculture.

H3: Motivation and technology exposure simultaneously have a significant effect on students' interest in agriculture.

3. METHOD

3.1 Research Design

This study employed a quantitative research design to examine the influence of motivation and technology exposure on students' interest in agriculture. A quantitative approach is appropriate for examining relationships among variables through systematic measurement and statistical analysis, particularly in studies focusing on attitudes, perceptions, and career intentions (Creswell & Creswell, 2018). The study focused on identifying patterns of interest and the extent to which motivational and technological factors contribute to students' inclination toward agricultural careers.

3.2 Population and Sample

The population of this study consisted of senior high school students belonging to Generation Z and residing in Bekasi Regency, Indonesia. Generation Z refers to individuals born between 1997 and 2012 (Pew Research Center, 2019). This group was selected because students at this educational level are at a critical stage of career exploration and decision-making, during which interests and aspirations begin to translate into future career intentions.

A purposive sampling technique was employed to ensure that respondents met the research criteria, including being a senior high school student, belonging to Generation Z, and residing in the study area. A total of 101 valid responses were collected and analyzed. This sample size is considered adequate for regression-based quantitative analysis and meets the minimum requirements commonly applied in social science research.

3.3 Data Collection

Primary data were collected through a structured questionnaire distributed online using Google Forms. Online surveys are widely used in contemporary educational research due to their efficiency, accessibility, and ability to reach young respondents who are familiar with digital platforms (Evans & Mathur, 2018). Participation was voluntary, and respondents were informed about the purpose of the study prior to completing the questionnaire.

The questionnaire consisted of three main sections measuring motivation, technology exposure, and interest in agriculture. Responses were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), which is commonly used to measure attitudes and perceptions in social science research (Joshi et al., 2015).

3.4 Measurement of Variables

Motivation was measured through items reflecting both intrinsic and extrinsic aspects, including personal interest, perceived social contribution, and external encouragement. The distinction between intrinsic and extrinsic motivation is widely recognized in educational and career-related studies (Ryan & Deci, 2017). Technology exposure was measured through items assessing respondents' familiarity with agricultural technologies and their interest in learning about modern agricultural practices. Students' interest in agriculture was measured through items capturing willingness and intention to consider agriculture as a future career, consistent with prior studies on career intention and youth participation in agriculture (Akpan et al., 2020).

3.5 Data Analysis

Data analysis was conducted using statistical software. Descriptive statistics were used to summarize respondents' characteristics and overall trends. Prior to hypothesis testing, validity and reliability tests were conducted to ensure measurement quality. Cronbach's alpha values exceeding the commonly accepted threshold indicate acceptable internal consistency (Taber, 2018).

Classical assumption tests, including normality, heteroscedasticity, and multicollinearity tests, were performed to confirm the suitability of the data for regression analysis. Multiple linear regression analysis was then employed to test the proposed hypotheses and examine the influence of motivation and technology exposure on students' interest in agriculture. Regression analysis is widely used in educational and social science research to examine predictive relationships among variables (Hair et al., 2019).

4. RESULTS AND DISCUSSIONS

4.1 Descriptive Results

The descriptive analysis provides an overview of students' motivation, technology exposure, and interest in agriculture. The results indicate that students generally demonstrate moderate to high levels of motivation and technology exposure, as indicated by the mean score of motivation ($M = 10.29$, $SD = 2.66$) and technology exposure ($M = 14.80$, $SD = 2.86$). Students' interest in agriculture also shows a relatively high average score ($M = 14.31$, $SD = 3.90$), although agriculture is not the primary career preference for most respondents.

These results suggest that many students demonstrate a latent interest in agriculture, particularly when it is associated with modern practices and technological innovation. This indicates that students' perceptions of agriculture are not entirely negative but remain conditional on how the sector is presented. This finding supports previous studies showing that youth interest in agriculture increases when farming is framed as innovative and future-oriented rather than traditional and labor-intensive.

4.2 Effect of Motivation on Students' Interest in Agriculture

The regression analysis shows that motivation has a positive and statistically significant effect on students' interest in agriculture. This relationship is evidenced by a positive regression coefficient ($B = 0.838$), a high t -value ($t = 9.214$), and a significance level of $p < 0.001$. This indicates that every one-unit increase in motivation leads to an increase of 0.838 units in students' interest in agriculture, assuming other variables remain constant.

This finding confirms that students with higher intrinsic and extrinsic motivation are more likely to consider agriculture as a potential career option. Motivation encourages students to explore career opportunities beyond commonly preferred sectors and increases their openness to agriculture when they perceive personal value, social contribution, or future

prospects in the sector. The results reinforce the view that psychological factors play a central role in career decision-making processes, particularly in shaping agricultural career interest.

4.3 Effect of Technology Exposure on Students' Interest in Agriculture

Technology exposure is also found to have a positive and statistically significant effect on students' interest in agriculture. The regression results show a positive coefficient ($B = 0.547$) with a t -value of 6.465 and a significance level of $p < 0.001$. This indicates that increased exposure to agricultural technology significantly enhances students' interest in agriculture.

These findings suggest that technology plays an important role in reshaping the image of agriculture among young people. Exposure to digital farming, smart agriculture, and modern production systems helps reduce the perception of agriculture as outdated and physically demanding. Instead, agriculture is increasingly perceived as a sector offering innovation, creativity, and entrepreneurial opportunities. This supports existing literature emphasizing the role of technology-based agricultural education in increasing youth engagement.

4.4 Simultaneous Effect of Motivation and Technology Exposure

The simultaneous regression results indicate that motivation and technology exposure jointly have a significant effect on students' interest in agriculture. This is supported by the F -test result ($F = 189.102$, $p < 0.001$), confirming that the regression model is statistically significant.

The coefficient of determination shows that the model explains a substantial proportion of variance in students' interest (Adjusted $R^2 = 0.794$), indicating that 79.4% of the variation in students' interest in agriculture is explained by motivation and technology exposure. Comparative analysis of regression coefficients reveals that motivation has a stronger influence than technology exposure, confirming that while technology acts as an important catalyst, internal motivation remains the primary driver of students' interest in agriculture.

These findings highlight the importance of adopting an integrated approach that combines motivational strategies with technology-based learning. Educational programs that simultaneously strengthen students' motivation and expose them to modern agricultural technology are more likely to foster sustained interest in agriculture.

4.5 Discussion and Implications

The results of this study confirm that students' interest in agriculture is influenced by a combination of psychological and technological factors, with motivation emerging as the dominant determinant and technology exposure playing a complementary yet significant role. This finding is consistent with the literature on career interest formation, which emphasizes that internal psychological drivers—such as motivation, values, and perceived meaning play a central role in shaping career intentions, particularly among younger generations (Ryan & Deci, 2000; Lent et al., 2016).

Previous studies on youth engagement in agriculture have similarly reported that motivation strongly influences students' willingness to consider agricultural careers. Akpan et al. (2020) and Ndofirepi et al. (2021) found that students are more likely to develop interest in agriculture when they perceive the sector as meaningful, socially valuable, and aligned with their personal aspirations. These findings align with the present study, where motivation shows a stronger statistical influence than technology exposure, indicating that technological advancement alone is insufficient to attract youth if motivational aspects are not simultaneously addressed.

At the same time, the significant effect of technology exposure supports existing research highlighting the role of digitalization and innovation in reshaping the image of agriculture. Studies by Wolfert et al. (2017) and Klerkx et al. (2019) demonstrate that smart

farming, digital agriculture, and data-driven production systems can reduce the perception of agriculture as labor-intensive and outdated, especially among Generation Z, who are highly familiar with digital technologies. In line with the literature review, the findings of this study indicate that exposure to agricultural technology helps present agriculture as a modern and future-oriented sector, thereby enhancing its attractiveness to students.

However, the dominance of motivation over technology exposure suggests that policies and educational initiatives focusing solely on technological modernization may have limited impact if they do not address students' psychological needs. This supports arguments made by the Food and Agriculture Organization of the United Nations (2018), which emphasize that youth participation in agriculture depends not only on access to technology but also on motivation, education, and social recognition. Similarly, Rose and Chilvers (2018) argue that technological innovation must be accompanied by social and educational strategies to ensure meaningful youth engagement in agriculture.

From an educational perspective, these findings reinforce the importance of integrating agriculture-related technology into school curricula while simultaneously strengthening motivational strategies. Technology-based learning such as digital simulations, smart farming demonstrations, and exposure to modern agricultural tools can help reshape students' perceptions of agriculture (Klerkx et al., 2019). At the same time, motivational interventions, including career guidance, exposure to successful young farmers, and discussions on the social importance of agriculture for food security and sustainability, can enhance students' internal drive to consider agricultural careers (Akpan et al., 2020; FAO, 2018).

Overall, this study supports the literature suggesting that encouraging youth participation in agriculture requires a balanced and integrated approach that combines personal motivation with technological innovation. By addressing both psychological and technological dimensions, agriculture can be positioned as a modern, meaningful, and sustainable career option for younger generations, particularly in developing and industrial-adjacent regions.

5. CONCLUSION AND IMPLICATION

5.1 Conclusion

This study examined the influence of motivation and technology exposure on high school students' interest in agriculture. Using a quantitative approach and multiple linear regression analysis, the findings reveal that both motivation and technology exposure have a positive and significant effect on students' interest in agriculture. Motivation emerged as the more dominant factor, indicating that students' internal drive and perceptions play a crucial role in shaping their career interests.

The results suggest that students' interest in agriculture is not inherently low, but rather influenced by how agriculture is perceived and presented. When agriculture is associated with personal meaning, social contribution, and future opportunities, students are more likely to consider it as a viable career option. Technology exposure further strengthens this interest by transforming agriculture into a modern and innovative sector that aligns with the digital orientation of younger generations.

Overall, this study provides empirical evidence that psychological and technological factors jointly contribute to youth engagement in agriculture. The findings highlight the importance of addressing both dimensions to ensure the sustainability of the agricultural sector in the future.

5.2 Practical and Policy Implications

The findings of this study offer several practical implications for educators, policymakers, and educational institutions. First, agricultural education programs should place

greater emphasis on motivational aspects, such as fostering positive attitudes toward agriculture, highlighting its societal importance, and promoting success stories of young agricultural entrepreneurs. Strengthening students' intrinsic and extrinsic motivation can significantly enhance their interest in agricultural careers.

Second, the integration of agricultural technology into school curricula is essential. Exposure to digital farming tools, smart agriculture, and technology-based learning can help reshape students' perceptions of agriculture as an innovative and future-oriented sector. Schools and educational institutions are encouraged to collaborate with agricultural stakeholders to provide students with hands-on experiences and exposure to modern agricultural practices.

From a policy perspective, youth-oriented agricultural programs should adopt a holistic approach that combines motivational strategies with technological innovation. Policies that support agricultural education, technology access, and youth empowerment can play a vital role in encouraging younger generations to participate in the agricultural sector. Such efforts are crucial to addressing the challenges of farmer aging and ensuring long-term agricultural sustainability.

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