



The Influence of Educational Infrastructure in Agricultural Learning Environment on Students' Interest and Program Selection

Nur Dinie M.I.¹, Enio M.S.K.^{1*}

¹Universiti Putra Malaysia,
 Department of Science and Technical Educational Studies, 43400 Serdang, Selangor, MALAYSIA

*Corresponding Author

DOI: <https://doi.org/10.30880/jtet.2023.15.03.001>

Received 5th August 2023; Accepted 25th August 2023; Available online 29th September 2023

Abstract: There is a growing global concern in agricultural education due to past findings on students' lack of interest in studying and considering a career in agriculture. In spite of this, past local studies have shown an agricultural-related careers are getting more interest from students due to the practical learning environment provided by the UPM Agricultural Science Foundation (ASPer UPM) but there is no thorough explanation regarding the elements of practical learning environment that affects students' interest. This qualitative study was to provide additional insight into the learning infrastructure as a component of the agricultural subjects' practical learning environment by examining how infrastructure in agricultural practical learning environment influences students' interest and selection of agriculture as a field of study. Furthermore, it attempts to identify students' perceptions of practical learning infrastructure as part of the ASPer UPM learning environment. This qualitative study collected data through the focus group interview using an interview questions instrument. The study found that students perceive the provision of infrastructure and equipment as not uniform, and the technology adopted is inadequate and only sufficient to help with basic work. The students also perceive the instructors' expertise and specialisation as helping them understand the course content and the specialised locations are aligned with the learning content. The study found that students' interest could be increased by changing the learning location and content, providing adequate, usable and conducive infrastructure and implementing clear teaching and practical learning procedures. At the same time, infrastructure can generate curiosity, provide early exposure to agriculture and change negative perceptions and interests to influence students to select agriculture as a field of study. Lastly, this study found an apparent relationship between Faculty of Agriculture cluster students' selection of fields of study and their foundation course CGPA. These results can be utilised as guidance for agricultural education institutions to design a high-quality practical learning environment via enhanced infrastructure.

Keywords: Learning infrastructure, practical learning, field of study selection, students' interest, agricultural subjects

1. Introduction

The agriculture sector was named one of the priority sectors for empowerment in the national Budget 2021. Although agriculture is a major contributor to the country's economy, the progression of the agricultural sector is still plagued by several challenges that must be overcome immediately. According to Luo and Guan (2021), labour shortages have been a serious issue. Agricultural education is an important element in ensuring the sustainability and growth of the agricultural sector. However, a survey by Youth Insight (Australia) (2017) found a consistent result for students each year where more than half of the students showed little interest in agriculture. The study also found that the main reasons students

refuse to consider a career in agriculture are disinterest, boredom and the lack of appeal. The study concluded that students' disinterest in agricultural careers would influence their lack of preference for agricultural courses for tertiary study.

On the other hand, Sidek and Mohd. Puad (2018) stated that the learning environment is one of the catalysts for students' interest in enrolling in the Agricultural Science Foundation programme and furthering their study in agriculture at UPM. However, the study only touched on the issue in general, and there is a lack of in-depth studies. In this regard, Hatane, Setiono, Setiawan, Samuel, and Mangoting (2020) described that learning environment comprises learning facilities and activities. In this regard, infrastructure is also deemed as facilities. Therefore, infrastructure encompasses resources needed for an activity, such as employees, structures, or equipment (Merriam-Webster, 2019).

There are many stakeholders that will benefit from this study, including Centre of Foundation Studies for Agricultural Sciences (ASPer) itself, other educational institutions that offer practical classes and Ministry of Education. According to the research Park et al. (2019), improvement in performance was more effective with specific feedback than with general feedback. By conducting this study, ASPER administration had the opportunity to assess themselves using specific feedback received from students regarding infrastructure that has been provided for practical courses in agriculture. Based on the findings of this study, the foundation can improve or maintain the existing infrastructure in the agricultural subjects offered in practical learning environments for better educational quality. To give students a more appropriate and pleasant learning environment, it is required to enhance the infrastructure and resource modules of classrooms (Dai et al.,2021).

Thus, agricultural-related educational institutions such as schools and faculties in universities, may use this study as a guidance to improve practical learning environments through emphasizing the importance of better infrastructure in order to develop a more effective learning environment for agricultural subjects by examining the crucial infrastructure elements mentioned in this study. The results of the study can assist Ministry of Education make decisions on the implementation of strategies that might guarantee the provision of educational infrastructure for high-quality education (Omae et al.,2017). This study can help the Ministry of Education and the Ministry of Higher Education to draw up a plan for more effective and high-quality agricultural subjects in the future. This study can be used as a reference to find out to what extent and how the infrastructure in the practical learning environment affects students' interest and choice of field of study. It also provides information regarding the actual student perception of the infrastructure in the practical learning environment for the existing agricultural subject. With this, it will facilitate the ministries' efforts to improve the effectiveness of the practical learning environment for agricultural subjects through infrastructure improvements. Improvements made by every entity involved could encourage prospective students to further their education in agriculture.

1.1 Research Objectives

This study aimed to provide additional insight into the learning infrastructure as a component of the agricultural subjects' practical learning environment by examining how infrastructure in agricultural practical learning environment influences students' interest and selection of agriculture as a field of study among UPM Agricultural Science Foundation (ASPer UPM) programme. Furthermore, it attempts to identify students' perceptions of practical learning infrastructure as part of the ASPER UPM learning environment.

1.2 Scope of the Study

Infrastructures are a resources needed for an activity, such as employees, structures, or equipment (Merriam-Webster, 2019). The infrastructure examined in this study encompasses all facilities provided for practical learning of agricultural subjects. These facilities include the technology used, the expertise of instructors or lecturers, and the locations for practical learning, such as farms, buildings or designated classrooms or learning. Moreover, teaching aids such as tools, materials, and machines are considered facilities. Interest is defined as an association involving pleasant feelings between a person and a physical thing, activity, or subject of interest (Rowland, Knekta, Eddy, & Corwin, 2019). Knogler, Harackiewicz, Gegenfurtner, and Lewalter (2015) states that environmental factors and enduring personal preferences influence a person's instantaneous experience of interest. In this case, this study examines ASPER UPM students' preferences and interests towards agriculture as a field of study. Another key term in this study is 'selection', defined by the Merriam-Webster (2014) as the act of choosing. This study relates to the student's selecting their field of study, which refers to an educational division or branch (Merriam-Webster, 2019^a; 2019^b). Hence, it is linked to students selecting a major or cluster of subjects to study at the highest level of education. In the context of this study, it refers to the actions of ASPER UPM students in choosing a major for their degree after completing the Foundation of Agricultural Sciences programme.

The study sample only involves UPM ASPER in the 2017/2018 session because it meets the requirements of the study because students must undergo physical practical learning sessions to enable them to have complete experience using the infrastructure provided at the UPM Agricultural Science Foundation

1.3 Framework Study

This study adopted the triadic reciprocal principle in Social Cognitive Learning Theory (Bandura, 1986) along with the Theory of Interest (Hidi and Renninger, 2006) and Theory of Choice (Glasser, 2010).

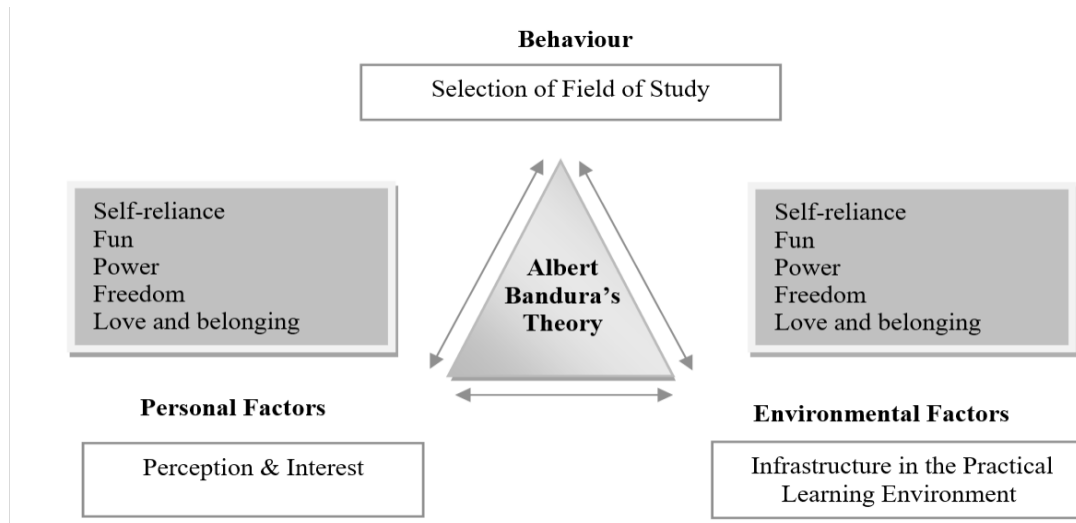


Fig. 1 - Study framework

The triadic reciprocal principle in Albert Bandura's Theory of Social Cognitive Learning emphasises that environmental, personal and behavioural factors work as interrelated determinants. In this study, environmental factors (infrastructure for practical learning and the learning environment) interact and influence students' personal factors (perceptions and interests) toward agriculture. In turn, it influences the behavioural elements, i.e. choosing the agricultural-related field of study. Furthermore, environmental factors (infrastructure) can determine behaviour (selection of the field of study) directly without relying on personal factors (perception and interest) as mediating factors. Choice Theory being used to explain basic needs an individual tends to fulfil in the process of choosing a field of study.

2. Literature Review

Learning infrastructure is the main component supporting students' learning at the school and tertiary levels of education. The main problems highlighted by educational institutions in teaching agricultural subjects include the lack of physical infrastructure and supporting materials. As a result, some schools are not able to provide workshop facilities, and some are forced to use vocational subjects (MPV) or Integrated Learning Skills (KH) workshops. This situation has put pressure on instructors, teachers, and students because they are forced to focus on the theoretical aspect of the subject. (Mohd. Taib and Mustapha, 2017; Mohd Yasin et al., 2012).

Ghani et al. (2018) described the infrastructure in the Arabic language environment as unsatisfactory and uncondusive. In addition to the issue of mainstream educational infrastructure, Mohd Yasin et al. (2013) stated that most special education instructors have negative perceptions of the infrastructure available for special education classes. For instance, students' activities are often interrupted by the narrow design of the classes.

The learning environment is a fundamental element in each learning process. Past studies on the benefits of practical education, such as Kim, Spears, Vargas-Ortega, and Kim (2018) that focused on the practical learning environment and student engagement through *Sustainable House* (SH). SH is a medium of engagement that facilitates students and instructors and injects motivation to interact and collaborate among students. It also allows students to apply the theoretical concepts learned to practice while providing a detailed understanding of the knowledge learned. A conducive learning environment can contribute to good lesson content and teaching staff instruction to improve learning outcomes. The learning environment can also empower knowledge and positively impact the student's career selection. A well-structured learning environment can increase students' interest and engagement in the lesson contents and subjects, which shape their desire for future careers (Hatane & Setiawan, 2019). Jahanpour, Azodi, Azodi, and Khansir (2016) examined factors hindering the clinical learning of prospective trainee nurses and found that an unsatisfactory practical learning environment and incompetent teaching staff and instructors hindered the assimilation of theoretical and practical skills among students, which affected the outcome of their training.

The element of interest is an element often studied by researchers from various fields, especially in the field of education. For example, Kahu, Nelson and Picton (2017) found that student engagement can be enhanced by aligning the subject with the student's interests and with the presence of enthusiastic and highly knowledgeable teachers. The alignment with students' interests and the presence of teachers who meet these criteria create excitement, a sense of

belonging, and the subsequent sense of situational interest. Carmichael, Callingham, and Watt (2017), on the other hand, asserted that there is no relationship between the teacher's enthusiasm and the student's emotional interest and found an apparent negative relationship between the teacher's enthusiasm and students' cognitive interest.

Several studies on the students' selection of study fields found that insufficient exposure to a particular subject at the school level causes less encouraging perception and interest. In this regard, students' interests will be enhanced through pre-graduate or foundation programmes that often provide insights into careers in a particular field, consequently influencing the selection of study fields at the graduate level. (Mohamad, A. et al., 2020; Scherer, A.K., 2016). Several studies, such as Husin and Md Nor (2018), examined interests, family and career opportunities/employability as factors for course selection. Interests, family, and employability/career opportunities all have a positive relationship with the selection of study courses, with employability/career opportunities having the strongest link, followed by interest. The study also found that family factors are the weakest influencing factors. In the meantime, Bukhori et al. (2015) found that students select their courses mainly based on their preferences. Thus, interest is one of the determinants of students' preference in choosing their course of study. In addition, although parents play a role in choosing students' course of study, this study found that only less than twenty per cent of pupils choose a course based on their parents' wishes. The study also found that less than 10 per cent of students make decisions based on peer influence. This means that peer influence only weakly influences students' study course selection. In addition, almost ninety per cent of pupils indicated that they chose the course of study not because of the limited availability of alternative courses.

Based on the literature review, the researchers found that there is still a lack of studies focusing on practical learning infrastructure as part of the learning environment for agricultural subjects, especially among students of higher learning institutions. Most of the past studies reviewed touched on TVET and non-TVET instructions in general, but very few studies have specifically focused on agricultural subjects. Furthermore, while existing studies have focused on students' areas of study or career selection, there are limited studies on students' selection of agriculture as a field of study at the graduate level. Thus, this study was carried out to contribute to and fill the gap in the existing literature on agricultural education. It focuses on practical learning infrastructure as part of the learning environment for agricultural subjects and its influence on the students' interest and selection of agriculture as a field of study.

3. Research Methodology

This study adopted qualitative study approach by using focus groups technique. Focus groups give in-depth understanding regarding this study by conducting interview. This focus groups technique uses convenience sampling used to select informants who fit the study's criteria, i.e., students experienced in attending practical learning for agricultural subjects physically. In this study, population comprised of students enrolled in the ASPer UPM 2017/2018 session which are 950 students in this study since not all Foundation of Agricultural Science UPM (ASPer UPM) students can be selected because students who are studying from 2019 to 2021 do not have complete physical practical experience due to the Covid-19 pandemic.

Researchers had been the main instruments with the complement of interview questions. Interview questions built are open-ended questions. This study has three focus groups with six informants in total. The number of informants used in this study are relevant since it in line with Subedi (2021) that mentioned qualitative researchers are autonomous in selecting the participants, and they can choose between one to twenty samples depending on the depth of information needed. He also stated that using a small sample enables the researcher to concentrate on gaining an in-depth understanding of a social context, which is typically not achievable when using bigger samples. Focus groups divided according to three faculties offering agriculture-related programmes, namely the Faculty of Educational Studies, Faculty of Engineering and Faculty of Agriculture. Table 1 shows focus groups details.

Table 1 - Focus groups details

Focus Group	Faculty Cluster	Programmes/ Courses Involved	Informants Involved
1	Faculty of Educational Studies	Bachelor of Education in Agricultural Science with Honors	2
2	Faculty of Engineering	Bachelor of Agricultural and Biosystems Engineering	2
3	Faculty of Agriculture	Bachelor of Agricultural Science with Honours Bachelor of Animal Science with Honours	2

Each focus groups are being conducted separately through Google Meet. This way is being used to avoid any risk of Covid-19. Consent from each informant are collected and Google Meet are being recorded for transcribing purposes. The analysis of the raw data obtained from the interview started with complying and transcribing the raw data, followed by coding, theme classification and reporting.

4. Findings and Discussions

4.1 Students' Perception of Practical Learning Infrastructure as Part of the Learning Environment for Agricultural Subjects Under UPM Foundation of Agricultural Sciences

4.1.1 Non-Uniform Infrastructure Provision

Some informants mentioned infrastructure and equipment provided for practical learning activities are not standardised. This means that some activities need to be done manually because of the lack of tools and equipment. The informants also commented that the infrastructure provided in different practical sites is not standardised, as shown below, *"The materials, tools and machines are sufficient. Complete. But, for some practical activities, there is no equipment. For example, a machine. So, we need to do it manually, not using machines"*.

"Some sites provide simple equipment, and some have high-tech equipment".

The lack of standardised infrastructure and equipment across practical learning sites could jeopardise the outcome of agricultural courses. The lack of standardised infrastructure is especially evident in technology, where not all practical sites use advanced tools and equipment. There are still sites that use manual, traditional methods. The students also opined that the infrastructure available in most agricultural practical learning sites is outdated or incomplete, and there is a lack of infrastructure in some practical sites.

4.1.2 Instructor's Expertise and Specialization Helps Understanding

The students also perceive that the instructors' expertise and specialisation helped them understand the subjects better. This indicates that the instructors are highly knowledgeable specialists with long-standing experience in the field of agriculture. They also commented that they learn more from the instructors' expertise and specialisation during the practical learning than from theory classes. Students gain an understanding of the course content through detailed and practical instructions, question and answer sessions and the instructors' instruction style. One of the informants shared that,

"If we study in class, we learn theory, which might be hard to understand. But when we go to practical learning, we are taught by practical instructors who are all experienced for a long time in their field. So, when they explain one by one and demonstrate face to face, we'll understand it better during practical learning".

4.1.3 Locations Are Specialized According to Their Content

The students believe that the location of the practical agricultural training aligns with the learning content. A study by Capkun, Messner and Rissbacher (2012) emphasised that higher specialisation leads to more efficient provision of services. According to the students, each practical site has the appropriate specific characteristics and elements, indicating that the specialised sites used for practical learning are suitable and aligned with the learning content. These specific elements indirectly enhance the informants' focus and understanding. The informants commented:

"The location has a specific function. For example, cows and palms do not mix. Using specific location helps students to focus or understand".

Even the chosen location is very helpful. For example, many types of coffee are interesting and appropriate."

Location specialisation also enables the implementation of activities that are in line with the learning content. However, this finding contradicts Che Ahmad, Shaharim and Yahaya (2016), who emphasised that the practical learning site does not influence the learning environment.

4.1.4 Despite Less Than Satisfactory Technology, Basic Learning Can Still Be Supported

This study found that although some sites have less sophisticated technology and infrastructure, the informants shared that conducting some work manually helped increase their understanding of the agricultural subjects.

Several informants mentioned:

“There are fewer machines or technology. Old technology and old machines were used rather than new, updated technology. However, this can still help us understand agricultural subjects. Mostly, we’re doing things manually, using our hands”.

“I think it aligns with our foundation agricultural science syllabus. This foundation course provides basic exposure to agriculture. It provides the basics, an introduction”.

4.2 The Influence of Practical Learning Infrastructure On Students’ Interest Toward Agriculture

4.2.1 Enjoyable Weekly Practical by Varying of Learning Location and Content

Changing the practical site and changing learning content on a weekly basis have also influenced students' interest. An informant mentioned:

“In terms of practical sites, it varies. The site locations change, and we’ll learn new things. It is interesting to go to the next class, the next practical learning, because we are curious about what to learn next”.

This change has increased students’ interest and aroused their curiosity about the topics to be studied. The appropriate environment also makes the practical learning more interesting and motivates them to attend practical classes in the following weeks.

4.2.2 The Provision of Sufficient, Usable and Conducive Infrastructure

Interest is also aroused by providing sufficient, operational and suitable infrastructure. As an informant shared, *“Every week, we learn different things, so buying tools just for that week feels like a burden. So when the farm provides the tool and has enough infrastructure, it increases our motivation to return to the practical learning”.*

“Practical learning is very easy if there is enough infrastructure. It helps us throughout the practical learning and motivates us to attend it.”

The ever-changing learning content requires different tools and a lot of energy. Thus, providing adequate infrastructure can increase students’ motivation to attend and engage in weekly practical classes as it does not burden them financially and physically. This, in turn, motivates students to explore agricultural subjects more deeply.

4.2.3 Good Practical Teaching and Learning Procedures

Interest can also be fostered by providing clear procedures during the learning and practical learning. The informants’ responses showed that the teaching and learning procedures and components, such as the modules and teaching methods, are suitable for the students’ level.

“Manual or teaching method using machines is in line with the level of basic students who have just been exposed to agriculture. So, when they easily understand how to use... that will be a motivation to learn more in agriculture subject”.

“Indeed, he will show in detail. We can see where the mushroom blocks are stored, where the equipment is used and how to make the blocks”.

Furthermore, practical learning activities using the provided infrastructure have increased students’ motivation and interest in the field of agriculture and related subjects. These findings are supported by Sriklaub and Wongwanich (2014), who found that students' interest is increased by integrating learning resources from the environment into every step of the learning activity. In the meantime, Kwarikunda, Schiefele, Ssenyonga, and Muwonge (2020) showed that low intrinsic motivation among students affects their interest in learning a subject. This study found that implementing good teaching and practical learning procedures could increase students' motivation to learn, which consequently increases students' interest in learning the agricultural subject.

4.2.4 Valuable Experiences

Based on the informants’ feedback, their practical learning helped them gain valuable unique experience from other subjects.

“Not only learning in theory, but we also have practice. So, students will feel for themselves experiences that cannot be experienced outside or when taking other programs. It is quite special. I think that most students who go through agricultural practice at Asper will be interested in agriculture.”

“Only people who study and do those things get authentic knowledge, because when we do practice, tips are being shared. If we study theory only or take courses, we will not get the same tips as when we practice.”

It provides authentic and valuable knowledge that ultimately increases their interest in agriculture. This finding coincides with a previous study that found rich fieldwork experience will increase students' interest in a particular field (Ariwibowo,2013). Infrastructure in the practical learning environment can provide a valuable experience through increased engagement and student interest in the subject.

4.3 Influence of Practical Learning Infrastructure On the Selection of ASPer UPM Student Field of Study Selection

4.3.1 Infrastructure Arouses Curiosity

Infrastructure for practical learning could evoke students' curiosity on agricultural subjects and influence ASPer UPM's selection of agriculture as a field of study.

“When I observed, the infrastructure provided was good, the machines were also good. I feel like continuing my studies in the same field. The agricultural field is also because I want to study more deeply, I want to learn more about what machines are available.”

This finding aligns with Kidd and Hayden (2015), who found that curiosity is the driving force for learning and is influential in decision-making. This reflects that curiosity from the infrastructure used for practical learning has created a great impetus for further learning and influences students' decision to continue their studies in the agricultural field.

4.3.2 Infrastructure Provides Early Exposure

The initial exposure given during the foundation study on agriculture, especially in terms of infrastructure and practical learning environment in certain branches of agriculture, has influenced the students' decision to continue their studies in the same field. The informant also expressed interest in agriculture, ultimately making him choose agriculture to further his studies.

“Practical class infrastructure really influenced me in the field of Agriculture which I am taking now. When I went to dairy farm. I don't even know about the dairy machine because usually on TV or in movies, they collect milk using hand. And when I experienced agricultural practical class, then...ooo this is what dairy machine looks like. It gives us exposure.”

This is contrary to Kimura et al. (2021) findings, which highlighted that while early exposure improves students' understanding and interest, it does not affect their selection of career fields. This study's findings prove that early exposure to agricultural subjects during practical learning can influence students' selection of study courses

4.3.3 Infrastructure Changes Perceptions and Interests

It was found that the infrastructure provided has changed the students' perception positively. This is because sufficient infrastructure eases the workload in the field, especially for female students, thus influencing them to choose agriculture as a field of study at the degree level.

“The infrastructure in learning environment during foundation influences the selection of the field of study because we don't find it very difficult to do practical. In other words, the infrastructure helps give an interesting perception in the field of agriculture. That time when I saw it, before I did my practical, I thought agriculture was difficult and unsuitable for women. But the perception changes when doing practical work because there are many tools and technologies that can facilitate and make agricultural work easier”.

This finding differs from Secretario (2021), who observed a negative perception towards agriculture among youth, affecting their decision to choose agriculture as a field of study at the degree level. Thus, educational institutions should eliminate negative perceptions by implementing contextual and field-based learning components in agricultural education.

4.4 Association of Selection Factors for Field of Study and CGPA

This study also examined the association between the selection of fields of study and CGPA.

Table 2 - Association of field of study selection and CGPA

Faculty Cluster	CGPA	Factor for Selecting Field of Study	Excerpt	Association with CGPA
Faculty of Engineering	3.85	Interest in agriculture	<i>“Since the CGPA is quite ok. I can upgrade to a more challenging field, but I chose agriculture because of my interest which has been nurtured since my foundation. I found learning is conducive with complete infrastructure”.</i>	No
	3.60	Future career	<i>“If we look to the future or even in the next 5-10 years, the agriculture sector will be the main sector. We also lack engineers in agriculture. That's why I chose agricultural engineering”.</i>	No
Faculty of Educational Studies	3.20	Future career	<i>“I think in terms of jobs, because, like, if we take another field. When we should stay in that field, we need to work under others. But, for agriculture, we can work on our own. So, that's how in terms of a job, it is easy to get a job. So no need to expect to be employed by others”.</i>	No
	3.30	Interest in agriculture	<i>“I chose this because of my interest based I've seen during foundation. Farming is less stressful because it is fun. It is kind of practical..”.</i>	No
Faculty of Agriculture	3.63 (Sem 1)	Not the top choice	<i>“At first, I wanted to take the Veterinary course, but with my pointer, it was a little hard. So, I chose agriculture because it is easier.”.</i>	Yes
	3.00	Not the top choice	<i>“Relatively low, and there will be a choice for every foundation student when they want to pursue a bachelor's degree, Out of the five options. I put the bachelor in agriculture, specifically livestock science, as the fourth choice. It was not my Top 3 option”.</i>	Yes

As the findings above indicate, the Faculty of Agriculture cluster chose agriculture since it did not get its main choice. The finding is concerning since it is in line with that stated involuntary in pursuing agricultural education, among other things, restrains the growth of agriculture (Mkong et al., 2021).

5. Conclusion

In general, this study presents three main findings: students' perception regarding the infrastructure as part of the practical learning environment for Agricultural subjects and how the infrastructure affects UPM Agricultural Science Foundation

students' interest and choice of study field. Based on these findings, this research proposes suggestions to related parties such as the Ministry of Education Malaysia (MOE) and educational institutions, specifically the UPM Centre of Foundation Studies for Agricultural Science, faculties, instructors and researchers. The parties involved can use the recommendations in this study to improve the infrastructure in the practical learning environment of agricultural subjects, which will positively impact the student's learning process.

The first recommendation is to standardise infrastructure and facilities at each practical learning location. This will enable students to receive as much as possible similar input for each practical topic despite the different content. The second proposal is to allocate a budget to upgrade the existing infrastructure. The university should provide adequate, usable, conducive and updated infrastructure to increase students' interest in agriculture. Good infrastructure can also give students positive and quality exposure to Agriculture subjects.

The next recommendation is to ensure the alignment between practical learning locations and the learning content. Tertiary institutions offering subjects requiring practical learning, such as agricultural subjects, should provide suitable practical learning sites. Having suitable practical sites facilitates the implementation of topic-related activities and enhances students' engagement in learning and their understanding of the topic. The final recommendation is to execute efficient and effective planning of teaching and learning procedures. The findings showed that efficient teaching and practical learning procedures could motivate and increase students' interest in agricultural subjects. It also highlighted the importance for an educational institution to identify and plan the most suitable practical teaching and learning procedures before implementing them. In this regard, the planned teaching and learning procedures should consider the suitability of the content with the students' cognitive and intellectual levels and the available infrastructure to ensure their effectiveness. This is because a carefully designed procedure will leave a positive impression on the student.

Acknowledgement

We would like to express our sincere gratitude to all the individuals and organizations who have contributed to the publication of this research paper.

References

- Ariwibowo, C. (2013). *Pengaruh pengalaman praktik kerja industri dan hasil belajar kewirausahaan terhadap minat berwirausaha online siswa kelas XII Teknik Komputer Jaringan SMK Negeri Se-Kabupaten Kulon Progo tahun ajaran 2012/2013*. [The influence of practical industrial work experience and entrepreneurship learning outcomes on the interest in online entrepreneurship of Class XII Network Computer Technology SMK Negeri Se-Kupaten Kulon Progo academic year 2012/2013]. (MSc Thesis; p. 144). Universitas Negeri Yogyakarta.
- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. In *Google Books*. Prentice-Hall.
- Bukhori, M. F. M., Daud, R., Rahim, N. F., Ahmad, N. A., Mustapha, M. A., Azizan, F. L., Gopal, D. J. R. (2015). *Kajian Empirikal Awal Terhadap Pola Kecenderungan Pemilihan Aliran Pengajian Peringkat Pra-Universiti Oleh Pelajar Lulusan Sijil Pelajaran Malaysia (SPM)*. [A Preliminary Empirical Study of Pre-University Level Study Stream Selection Tendency Patterns by Malaysian Certificate of Education (SPM) Graduates]. *Jurnal Personalia Pelajar*, 18(1).
- Capkun, V., Messner, M., & Rissbacher, C. (2012). Service specialization and operational performance in hospitals. *International Journal of Operations & Production Management*, 32(4), 468-495. Emerald Publishing. <https://doi.org/10.1108/01443571211223103>
- Carmichael, C., Callingham, R., & Watt, H. M. G. (2017). Classroom Motivational Environment Influences on Emotional and Cognitive Dimensions of Student Interest in Mathematics. *ZDM*, 49(3), 449-460. <https://doi.org/10.1007/s11858-016-0831-7>
- Che Ahmad, C. N., Shaharim, S. A., & Yahaya, A. (2016). Kesesuaian Persekitaran Pembelajaran, Interaksi Guru-Pelajar, Komitmen Belajar dan Keselesaan Pembelajaran dalam Kalangan Pelajar Biologi (IR). [Suitability Of The Learning Environment, Teacher-Student Interaction, Learning Commitment And Learning Comfort among Biology (IR) students]. *Jurnal Pendidikan Sains & Matematik Malaysia*, 6(1), 101-120. Retrieved from <https://ir.upsi.edu.my/detailsg.php?det=1067>
- Dai, Z., Sun, C., Zhao, L., & Li, Z. (2021). Assessment of Smart Learning Environments in Higher Educational Institutions: A Study Using AHP-FCE and GA-BP Methods. *IEEE Access*, 9, 35487-35500. <https://doi.org/10.1109/access.2021.3062680>
- Ghani, K. A., Hassan, A. T., Rahman, A. A., Che Noh, M. A., Awang Mat, M. Z., Ismaill, Z., Salleh, S. A. M. (2018). Persekitaran Bahasa Arab dalam Pelaksanaan Kurikulum Bersepadu Dini di SABK. [The Arabic Language Environment in the Implementation of Early Integrated Curriculum at SABK]. *Jurnal Sultan Alauddin Sulaiman Shah*, 644-656. ResearchGate.

- Hatane, S. E., & Setiawan, F. F. (2019). Persepsi Lingkungan Belajar dan Keinginan Untuk Meningkatkan Pengetahuan Terhadap Niat Memilih Karier Akuntansi. [Perception of the Learning Environment and the Desire to Increase Knowledge of the Intention to Choose an Accounting Career]. *Ekuitas: Jurnal Pendidikan Ekonomi*, 7(2). <https://doi.org/10.23887/ekuitas.v7i2.17986>
- Hatane, S. E., Setiono, F. J., Setiawan, F. F., Semuel, H., & Mangoting, Y. (2020). Learning Environment, Students' Attitude and Intention to Enhance Current Knowledge In The Context Of Choosing Accounting Career. *Journal of Applied Research in Higher Education*, 13(1), 79-97. Emerald Publishing Limited. <https://doi.org/10.1108/JARHE-06-2019-0156>
- Hidi, S., & Renninger, K. A. (2006). The Four-Phase Model of Interest Development. *Educational Psychologist*, 41(2), 111-127. https://doi.org/10.1207/s15326985ep4102_4
- Husin, N., & Md Nor, S. Z. (2018). Faktor yang mempengaruhi pemilihan program pengajian di IPTS: Kajian di Fakulti Pengurusan dan Muamalah, Kolej Universiti Islam Antrabangsa Selangor. [Factors influencing the selection of study programs at IPTS: A study at the Faculty of Management and Education, Selangor International Islamic University College]. *Proceeding of the 5th International Conference on Management and Muamalah 2018 (ICoMM 2018)*, 390-398. Retrieved from <http://conference.kuis.edu.my/icomm/5th/images/e-proceeding/IC-035.pdf>
- Jahanpour, F., Azodi, P., Azodi, F., & Khansir, A. A. (2016). Barriers to Practical Learning in The Field: A Qualitative Study of Iranian Nursing Students' Experiences. *Nursing and Midwifery Studies*, 5(2). <https://doi.org/10.17795/nmsjournal26920>
- Kahu, E., Nelson, K., & Picton, C. (2017). Student Interest as A Key Driver of Engagement for First Year Students. *Student Success*, 8(2), 55. <https://doi.org/10.5204/ssj.v8i2.379>
- Kidd, C., & Hayden, Benjamin Y. (2015). The psychology and neuroscience of curiosity. *Neuron*, 88(3), 449-460. <https://doi.org/10.1016/j.neuron.2015.09.010>
- Kim, Y. H., Spears, D. L., Vargas-Ortega, E. E., & Kim, T.-H. (2018). A Practical Learning Environment for Sustainability and Sustainable Tourism. *International Journal of Sustainability in Higher Education*, 19(5), 1019-1035. <https://doi.org/10.1108/ijsh-02-2018-0015>
- Kimura, T., Kojo, K., Shiga, M., Chihara, I., Ikeda, A., Kandori, S., Nishiyama, H. (2021). Impact of early exposure to simulation program on undergraduate medical students' interest in urology. *Journal of Medical Education and Curricular Development*, 8, 238212052110207. <https://doi.org/10.1177/23821205211020750>
- Knogler, M., Harackiewicz, J. M., Gegenfurtner, A., & Lewalter, D. (2015). How Situational Is Situational Interest? Investigating the longitudinal structure of situational interest. *Contemporary Educational Psychology*, 43, 39-50. <https://doi.org/10.1016/j.cedpsych.2015.08.004>
- Kwarikunda, D., Schiefele, U., Ssenyonga, J., & Muwonge, C. M. (2020). The Relationship Between Motivation for, and Interest In, Learning Physics Among Lower Secondary School Students in Uganda. *African Journal of Research in Mathematics, Science and Technology Education*, 24(3), 435-446. <https://doi.org/10.1080/18117295.2020.1841961>
- Merriam-Webster. (2019). Field. In Merriam-Webster.com dictionary. Retrieved August 1, 2023, from <https://www.merriam-webster.com/dictionary/field>
- Luo, T., & Guan, Z. (2021). Public Health Insurance and Migration of Farm Workers in The U.S. *Applied Economics*, 54(15), 1672-1687. <https://doi.org/10.1080/00036846.2021.1980492>
- M. Yasin, R., Mustapha, R., Minghat, A. D., Jusoff, K., Ishar, A., & Shamsudin, S. (2012). Pelaksanaan Pengajaran Dan Pembelajaran Mata Pelajaran Lukisan Kejuruteraan Di Sekolah Menengah. [Implementation of Teaching and Learning Engineering Drawing Subjects in High School]. *The Asia Pacific Journal of Educators and Education (Formerly Known as Journal of Educators and Education)*, 27(1), 1-13. Retrieved from <http://eprints.usm.my/34600/>
- Merriam-Webster. (2019). Infrastructure. In Merriam-Webster.com dictionary. Retrieved August 1, 2023, from <https://www.merriam-webster.com/dictionary/infrastructure>
- Merriam-Webster. (2014). Selection. In Merriam-Webster.com dictionary. Retrieved August 1, 2023, from <https://www.merriam-webster.com/dictionary/selection>
- Merriam-Webster. (2019). Study. In Merriam-Webster.com dictionary. Retrieved August 1, 2023, from <https://www.merriam-webster.com/dictionary/study>
- Mkong, C. J., Abdoulaye, T., Donsop-Nguezet, P. M., Bamba, Z., Manyong, V., & Shu, G. (2021). Determinant of University Students' Choices and Preferences of Agricultural Sub-Sector Engagement in Cameroon. *Sustainability*, 13(12), 6564. <https://doi.org/10.3390/su13126564>

- Mohamad, A., Hashim, N., Ishak, A. K., & Abdullah, S. (2020). Student Entrepreneurial Thinking Of Malaysian Public Institution Of Higher Learning And Its Relationship With Students Study Field. *International Journal of Education, Psychology and Counselling (IJEPC)*, 5(35), 321-331. <https://doi.org/10.35631/IJEPC.5350027>
- Mohd Taib, M. T., & Mustapha, R. (2017). Kemudahan Prasarana Dalam Pelaksanaan Mata Pelajaran Teknologi Kejuruteraan, Lukisan Kejuruteraan dan Reka Cipta di Sekolah Menengah Harian Malaysia. [Infrastructure Facilities in the Implementation of Engineering Technology, Engineering Drawing and Design Subjects in Malaysian Day Secondary Schools]. *Sains Humanika*, 9(1-5). <https://doi.org/10.11113/sh.v9n1-5.1171>
- Mohd Yasin, M. H., Toran, H., Tahar, M. M., Bari, S., Ibrahim, S. N. N., & Zaharudin, R. (2013). Bilik Darjah Pendidikan Khas Pada Masa Kini dan Kekangannya Terhadap Proses Pengajaran. [Today's Special Education Classroom and its Constraints on the Teaching Process]. *The Asia Pacific Journal of Educators and Education (Formerly Known as Journal of Educators and Education)*, 28(1), 1-9. Retrieved from <http://eprints.usm.my/34610/>
- Omae, N. S., Onderi, H., & Benard, M. (2017). Quality Implications of Learning Infrastructures on Performance in Secondary Education: A Small Scale Study Of A County In Kenya. *European Journal of Education Studies*, 0. <https://doi.org/10.46827/ejes.v0i0.553>
- Park, J.-A., Johnson, D. A., Moon, K., & Lee, J. (2019). The Interaction Effects of Frequency and Specificity of Feedback on Work Performance. *Journal of Organizational Behavior Management*, 39(3-4), 164-178. <https://doi.org/10.1080/01608061.2019.1632242>
- Rowland, A. A., Knekta, E., Eddy, S., & Corwin, L. A. (2019). Defining And Measuring Students' Interest In Biology: An Analysis Of The Biology Education Literature. *CBE—Life Sciences Education*, 18(3), ar34. <https://doi.org/10.1187/cbe.19-02-0037>
- Scherer, A. K. (2016). High School Students' Motivations and Views of Agriculture and Agricultural Careers Upon Completion Of A Pre-College Program. Purdue University. Retrieved from https://docs.lib.purdue.edu/open_access_theses/998
- Secretario, M. L. (2021). Perception of Filipino Youth Towards Agriculture: Eradicating Agri Stereotypes Through Education. Retrieved from ResearchGate website: https://www.researchgate.net/publication/351226934_Perception_of_Filipino_Youth_towards_Agriculture_Eradicating_Agri_Stereotypes_through_Education
- Sidek, S., & Mohd Puad, M. H. (2018). Eksplorasi Minat Dan Faktor Dalam Pemilihan Kerjaya Pertanian Dalam Kalangan Belia. In: *Seminar Kebangsaan Majlis Dekan Pendidikan Universiti Awam (MEDC 2018)*, 7-8 Nov. 2018, Universiti Sultan Zainal Abidin (pp. 1329-1336). [Exploration Of Interests And Factors In Choosing An Agricultural Career Among Youth]. In: National Seminar of the Council of Deans of Public University Education (MEDC 2018), 7-8 Nov. 2018, Sultan Zainal Abidin University (pp. 1329-1336).
- Sriklaub, K., & Wongwanich, S. (2014). Learning Activities Aimed at Promoting Students' Interest: Synthesis of Master Teachers' Activity Organizing Methods Via TV Media. *Procedia - Social and Behavioral Sciences*, 116, 3375-3380. <https://doi.org/10.1016/j.sbspro.2014.01.767>
- Subedi, K. R. (2021). Determining the Sample in Qualitative Research. *Scholars' Journal*, 4, 1-13. <https://doi.org/10.3126/schol.v4i1.42457>
- William Glasser. *Choice Theory: A New Psychology of Personal Freedom*. Google Books, Harper Collins, 16 Nov. 2010, YouthInsight (Australia). (2017). *Developing student interest in the agriculture sector*.