

Students' Awareness, Acceptance, and Attitude Towards the Implementation of Green TVET

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Abstract

Current technical and vocational education and training (TVET) increasingly focus on the development of skills and knowledge related to sustainable practices and green jobs. However, the implementation of green TVET is not comprehensive due to our country's education system, which lacks emphasis on sustainability and environmental challenges. This results in students lacking sufficient knowledge about the involved issues. In light of this, this study is conducted to determine and identify the level of awareness, acceptance, and attitudes of TVET students toward the implementation of Green TVET programs. The study adopts a quantitative approach with a survey design through a questionnaire. Using random sampling method, a total of 165 undergraduate students in the field of education at the Faculty of Education and Vocational Technology, UTHM, participated as respondents. Descriptive analysis, including mean and standard deviation, as well as independent t-test, were employed to analyze the data. The study findings indicate high minimum scores for the aspects of awareness, acceptance, and attitudes of TVET students toward the implementation of Green TVET. The study also found no significant differences between male and female students in terms of awareness and acceptance, while for attitudes, there was a significant difference between male and female students. In conclusion, this study provides a more in-depth insight into the level of awareness, acceptance, and attitudes of students, contributing to a better understanding of how Green TVET is perceived and embraced by students.

1. Introduction

Green TVET has been broadly implemented in the western world such as Denmark and Germany. As we all know, Denmark is one of the countries that emphasizes environmental protection. For this reason, the green concept has long been applied in the TVET system in Denmark. In the context of Malaysia, the implementation of green TVET is not fully implemented due to the lack of emphasis on green TVET by the government and policy makers. This scenario has caused low students' awareness towards the green TVET implementation at TVET institutions.

Kamaruddin et al. (2021) has conducted a study to investigate students' perception concerning the Green TVET in Malaysia. The findings showed that although students' attitudes towards the idea of green TVET was positive, the participating respondents did not have a comprehensive knowledge of what is involved and how it relates to their future profession. This lack of understanding is linked to their school system's insufficient exposure to sustainability and environmental education within TVET context (Kamaruddin et al., 2021). The problem of lack of knowledge and solid understanding of green TVET will contribute to the low level of awareness

of green TVET among students. Anwar and Tariq (2019) also conducted a study on students' perceptions of sustainable practices in TVET in Pakistan. The study found that students lack understanding of sustainable behavior, and this is mostly due to the lack of curriculum coverage of sustainability and concern for the environment (Anwar & Tariq, 2019).

To address the lack of awareness among students about green TVET, Jusoh, Bakar, Nor, Rahman, and Bakri, (2021) emphasized the importance of integrating the concept of sustainability into the curriculum and providing relevant and practical learning experiences. The study highlights the success of Indonesia's Green TVET program, which includes practical training and community service activities that emphasize the importance of sustainability in their future careers. Overall, the study emphasizes the importance of addressing students' lack of awareness of green TVET through curriculum integration, hands-on learning experiences and industry engagement. By doing so, students develop a sense of sustainability responsibility and contribute to a more sustainable future (Jusoh et al., 2021).

The issue in TVET students' acceptance of sustainability in TVET courses is that some students may not have sufficient awareness of environmental issues and the importance of sustainability. This is because, students may not have sufficient knowledge about how sustainability is related to their career field and how sustainability practices can help improve the efficiency and effectiveness of operations in their career field (Jusoh, Bakar, Nor, Rahman, & Bakri, 2021). According to a study by Jalaludin and Abdul Hamid (2020), TVET students in Malaysia place a low emphasis on the sustainability of education. This study shows that students' awareness and acceptance of the sustainability of TVET still needs to be improved (Jalaludin & Abdul Hamid, 2020). In addition, the lack of practical experience in TVET projects may be another issue that affects students' acceptance of sustainability while undergoing TVET courses. Students may not be able to see and also be exposed to how practicing sustainability can be applied in their career field if they themselves are not exposed to practical situations and experiences related to sustainability (Hussain, Shaukat & Ishaq, 2019). Therefore, only a small part of students considers sustainability as an important factor in their career choice (Hussain, Shaukat & Ishaq, 2019).

Student behavior towards green TVET, or technical and vocational education and training with a focus on sustainability, is an important factor in the success of the program. In general, students who have a better understanding and acceptance of the principles of sustainability are more likely to have a positive attitude towards the implementation of green TVET. The issue of students' attitude towards the implementation of green TVET is a problem that is often faced in TVET around the world. Several studies show that the level of awareness and concern of TVET students towards sustainability is still low, especially in developing countries such as Malaysia (Jalaludin & Abdul Hamid, 2020). This leads to student attitudes that may show negative behavior towards sustainability and green TVET. These students may see sustainability practices as unnecessary or too expensive, or they may lack awareness or understanding of environmental issues and their impact on Malaysian society (Jalaludin & Abdul Hamid, 2020). Among the factors that contribute to the negative attitude of TVET students towards sustainability in Malaysia include a lack of knowledge and awareness about sustainability issues, a lack of support and participation in sustainability programs, as well as a lack of opportunities to participate in Malaysian sustainability activities (Jalaludin & Abdul Hamid, 2020).

Gender-related issues in green TVET or vocational and technical education and training with a focus on sustainability are important because there are significant differences between men and women in involvement and achievement in this field. There is a significant gender gap in the field of green TVET. There is a tendency that men are more likely to be involved in environmental programs than women, especially in areas such as green technology and natural resource management (UNESCO, 2017). This will contribute to the unequal perception of green TVET among male and female students. One of the factors that contribute to this gap is gender stereotypes that still exist in society (Gesing & Glass, 2019). Many women are still influenced by the idea that green and technical fields are more suitable for men, while fields such as beauty or customer service are more suitable for women (Gesing & Glass, 2019). The gender imbalance in green TVET also indirectly has implications for the economic sector. The participation of women in green TVET is important to fill the growing labor shortage in technology and natural resource management (UNESCO, 2017).

Based on the abovementioned issues, this research was conducted to find out the students' awareness, acceptance, and attitude towards green TVET implementation at the university. In addition, this research also attempted to investigate the gender differences from the aspects of awareness, acceptance, and attitude towards green TVET implementation.

1.1 Green TVET

Green TVET is a technical and vocational education and training approach that focuses on environmental sustainability and sustainable development. This approach involves five main pillars that are interconnected and mutually reinforcing: green campus, green curriculum, green community, green studies, and green culture (UNESCO, 2021).

The first pillar, the green campus, involves sustainable practices within the campus or educational institution (UNESCO, 2021). This includes solid waste management, efficient use of energy and water, and campus building and landscape design that promotes green practices. The second pillar, the green curriculum, integrates the principles of environmental sustainability and sustainable development into the TVET curriculum (UNESCO, 2021). In this curriculum, emphasis is placed on learning and training that discuss aspects of environmental sustainability such as natural resource management, renewable energy, and solid waste management. The third pillar, green community, involves interacting with local communities and contributing to environmental sustainability through outreach programs and community projects that promote sustainable practices (UNESCO, 2021). This pillar also helps in understanding aspects that influence the level of student awareness, for example such as off-campus activities and industrial activities. Green TVET institutions play a role as contributing centers to environmental sustainability in the surrounding community. The fourth pillar, green research, involves research and studies to understand and improve the impact of TVET on the environment (UNESCO, 2021). Through this study, Green TVET institutions can measure the quality of the environment, assess its impact, and develop innovations and new technologies that are more sustainable. The fifth pillar, green culture, involves changing attitudes and culture among students, staff, and citizens of Green TVET institutions (UNESCO, 2021). This institution promotes awareness, understanding, and understanding of the importance of environmental sustainability and sustainable practices through awareness programs, workshops, and active involvement in sustainable projects.

By strengthening each of these pillars, Green TVET institutions can act as agents of change that contribute to environmental sustainability and sustainable development in the technical and vocational education and training sector.

1.2 Implementation of Green TVET

The implementation of Green TVET refers to the implementation of technical and vocational education and training approaches that focus on environmental sustainability and sustainable development. It involves the application of the principles of environmental sustainability in all aspects of TVET education and training, including curriculum, campus management, community involvement, studies and research, as well as the formation of a green culture (Jayaprakash, 2024; Kastrop & Winzier, 2013).

Kastrop & Winzier (2013) stated that in the implementation of Green TVET, TVET institutions make changes and adaptations in their approach and practices to ensure a greater emphasis on environmental sustainability. This may involve reforming and restructuring the curriculum by including elements of environmental sustainability and sustainable development, such as natural resource management, the use of green technology, and the practice of sustainable practices in related industries and sectors (Lai, 2018; Zaime, Othman, Lai, Hasan, & Md. Said, 2020). In addition, the implementation of Green TVET also involves green practices in campus management, such as effective energy use, solid waste management, and sustainable building design (Mustapha, 2016). The institution also interacts with the local community and carries out green projects that benefit the community and the environment. Studies and research are conducted to understand the impact of TVET on the environment and to develop more sustainable innovations or technologies in the field of TVET. In addition, the formation of a green culture becomes important in the implementation of Green TVET, where attitudes, awareness, and sustainable practices are inculcated among students, staff, and citizens of TVET institution (Lai, Baharom, Lee, Wan Muda, Rosli, & Ana, 2021).

By implementing the Green TVET approach, TVET institutions act as agents of change in contributing to environmental sustainability and sustainable development.

2. Methodology

This research adopted survey technique as research design using quantitative approach. According to Nardi (2018), survey design is suitable to be used to answer research questions related to the current status of the studied matter.

2.1 Research Sample

A total of 165 students from the the Faculty of Technical and Vocational Education, UTHM, have received questionnaire from the researchers. Out of 165 respondents, 88 were male students and the rest were female students. Table 1 shows the gender of respondents.

Table 1 Gender of respondents

Gender	Frequency	Percentage (%)
Male	88	53
Female	77	47

2.2 Research Instrument

Table 2 shows that the questionnaire that was developed contains 4 parts which is part A for demographic data which consisted of 9 items. Part B comprised 10 items measuring the students' level of awareness of green TVET implementation. Also, Part C was composed of 10 items which aimed to measure the level of acceptance of TVET students towards the implementation of green TVET. For part D, the attitude of TVET students towards the implementation of green TVET was measured by 10 items. The scale used for each item is a five-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 2 Section and number of item in questionnaire

Sections	Objective	Number of Item
A	Demographic Information	9
B	Awareness	10
C	Acceptance	10
D	Attitude	10

The validity of the questionnaire was determined by means of expert validation method in which three experts were invited to evaluate the items of the questionnaire. The items were revised and improved based on the feedback and suggestions provided by the experts. Additionally, the questionnaire demonstrated satisfactory reliability levels based on *Cronbach's Alpha*. The reliability levels are shown in Table 3.

Table 3 Reliability levels

Variable	Cronbach's Alpha	Reliability Level
Awareness	0.91	High
Acceptance	0.89	High
Attitude	0.94	High

3. Result and Discussion

A total of 165 completed questionnaires were collected through the Google Form application. The gathered data was analyzed to address the research questions related to variables such as awareness, acceptance, and attitude that influence the implementation of green TVET. The data analysis involved using descriptive statistics and inferential statistics for hypothesis testing. The results of the study are presented in the form of mean values and standard deviations.

3.1 Student's Awareness, Acceptance and Attitude Towards the Implementation of Green TVET

Table 4 shows the overall descriptive analysis showing mean value, standard deviation and level of agreement for each variable's which is awareness, acceptance and attitude. The results show that the mean score of knowledge, attitude and skills are 3.77 (SD=0.60), 4.08 (SD=0.57) and 3.79 (SD=0.77) respectively. This indicate that TVET student's perception towards the implementation of green TVET are high.

Table 1 Mean value for variables

Variables	Mean	Standard Deviation (SD)	Level of Agreement
Awareness	3.77	0.60	High
Acceptance	4.08	0.57	High
Attitude	3.79	0.77	High

3.2 The Difference Between Male and Female Students in Terms of Students' Awareness, Acceptance and Attitude Towards Green TVET

Table 5 shows the independent t-test analysis results for three measured variables, namely students' awareness, acceptance, and attitude towards the implementation of Green TVET based on gender groups.

Table 2 Analysis of independent t-tests according to aspects based on gender groups

Variables	t	df	Sig. (2-tailed)
Awareness	1.18	163	0.24
Acceptance	1.77	163	0.08
Attitude	1.99	163	0.05

For the awareness section, the result of the t-test analysis shows that there is no significant difference between male and female students in terms of the level of awareness, $t(163)=1.18$, $p>0.05$. This means that the null hypothesis fails to be rejected. In terms of students' acceptance level, the result indicates that the null hypothesis failed to be rejected because the results of the t-test analysis showed that there was no significant difference between male and female students, $t(163)=1.77$, $p>0.05$. For the students' attitude, it can be seen that the null hypothesis is rejected due to the significance of t-test result, $t(163)=1.99$, $p<0.05$. It means that there is a significant difference between male and female students in terms of students' attitude on green TVET.

All in all, it can be concluded that the t-test analysis shows that there is a significant difference in students' attitude towards the implementation of Green TVET between male and female students, while for the students' awareness and acceptance, it was found that there were no significant differences between different gender groups of students.

3.3 Discussions

3.3.1 Students' Awareness Towards the Implementation of Green TVET

The main findings of this study show that TVET students' awareness of green TVET implementation is at a high level. It reflects a strong consensus among students regarding awareness of Green TVET, especially in the research aspect that emphasizes environmental sustainability. This result is in line with the findings from a research conducted by Kaviza & Bukhari (2022), who found out that the TVET students tend to be more concerned about the aspects of sustainability and the positive impact of research.

The high level of students' awareness towards the green TVET implementation might be attributed to several reasons. First, the participating students might have been exposed to environmental education and knowledge of the impact of human activities on the environment. The sustainability program in the TVET curriculum provides an opportunity for students to understand the relationship between the skills learned and the sustainability of nature (Suhaimi, 2010). In addition, the provision of environment-friendly facilities and initiatives at TVET institutions are able to provide direct experience to students and indirectly foster students' awareness of sustainable practices throughout their studies (Bakar & Fairuz, 2021). The ability of students to embrace these sustainability values not only benefits the environment, but also prepares them to contribute to the sustainable development in the society and industry in the future (Omaridin & Zainul Abidin, 2014).

Overall, this study provides an important contribution to our understanding of students' awareness of the implementation of green TVET. By including the results obtained with previous studies, we can see that even though there is a high awareness of several aspects, there is still room for improvement in increasing students' awareness of sustainability issues. The implication of this study is the importance of integrating elements of sustainability in the TVET curriculum and providing sufficient facilities to ensure that students' awareness can be maintained and improved on this aspect.

3.3.2 Students' Acceptance Level Towards the Implementation of Green TVET

Another main finding of this study shows that TVET students' acceptance level towards the implementation of green TVET is at a high level. In addition, the present results also show that the participating students perceived that it is highly acceptable to be engaged in research projects that have a positive impact on sustainable development. This finding is in line with a previous study by Derahim et al. (2019), which also showed that TVET students tend to highly appreciate research activities related to sustainable development.

The high acceptance level among students can be explained by several factors. First, the students have been introduced to green TVET which made them having better understanding concerning green TVET implementation. This could be one of the reasons why students' acceptance is at high level. Nor Azizi (2021) stated that the introduction to the concept of green TVET can have a positive impact on students' acceptance of sustainability issues. Therefore, through the understanding gained, students at UTHM are able to yield high level of acceptance towards green TVET. The integration of green TVET elements in the curriculum and practical experience in sustainability projects at the institution also contributes to high acceptance level among TVET students towards green TVET (Zain et al., 2015). The exposure to green TVET can enhance the acceptance of students in green TVET implementation, which in turn produce students who are committed to sustainability practices.

In conclusion, this study provides important insight into the understanding of students' acceptance of green TVET. Although there is a high acceptance of some aspects, there are also significant differences in students' perceptions of certain issues. The implication of this study is the importance of ensuring consistency in the implementation of green TVET elements across programs and institutions in order to maintain and improve the level of student acceptance of sustainable development issues.

3.3.3 Attitude Level of TVET Students Towards the Implementation of Green TVET

Apart from the above, the students' attitude towards the implementation of green TVET is also at a high level. The results of this study show a very positive attitude towards environmentally friendly practices in students' daily lives. This result is in line with the findings from Mazlan et al. (2015), which states that a high awareness of responsibility towards the environment can create sustainable environmentally friendly practices and attitude.

The attitude of students towards the issue of sustainability is at a high level probably due to the fact that the TVET institutions focus greatly on the sustainability in teaching and learning. At UTHM, the implementation of the green campus concept became an applied initiative, which directly nurtured positive attitude among students towards sustainability. According to the study conducted by Haziqah & Choy (2022), through the green campus initiative, students not only become responsible consumers but also act as an agents of change who strive to instill a positive attitude towards sustainability among their peers and the surrounding community. In addition, the students' attitude in TVET institutions is also influenced by the teaching of lecturers who always emphasize the aspect of sustainability in the context of TVET and the importance of maintaining and preserving natural resources for the sake of future sustainability. This idea is supported by Rahman (2018) who believes that students are more inclined to apply the knowledge gained in aspects of sustainability into their daily lives and indirectly apply a positive attitude in themselves towards sustainability issues.

In short, this study has shed some lights on students' attitudes towards the implementation of green TVET. Although there is a positive attitude towards environmentally friendly practices in daily life, more focus needs to be placed on the integration of environmental issues in the TVET curriculum to increase students' engagement. The implications of this study stimulate the need to develop modules that emphasize environmental issues in the TVET curriculum, to achieve more optimal students' attitude and involvement among them in green TVET.

3.3.4 Differences in the Implementation of Green TVET Based on Gender in Terms of Awareness, Acceptance and Attitude

(i) Difference in Awareness Level

In terms of awareness, male and female students show that there is no big gap in the implementation of green TVET. This finding is in line with the study of Damanhuri et al. (2016), which shows that the awareness of green TVET does not show a significant difference between the two genders. Modern education in TVET institutions emphasizes gender equality, ensuring that male and female students have equal access to knowledge and opportunities. A study by Jima'ain et al. (2020) also confirmed that society's awareness of gender equality helps reduce the difference in perception and educational opportunities, which is inclusive of green TVET, among male and female students. This provides opportunities for both genders to develop in academic, professional, and social fields without discrimination based on gender.

(ii) Difference in Acceptance Level

In terms of students' acceptance in green TVET implementation, there was no significant difference was found in this research. The non-significant difference between male and female students may be due to students' perception of the importance of green TVET in their career choices. The results of this study are consistent with the findings of Zain et al. (2015), which show a similar level of acceptance between male and female students towards green TVET. Mukapit et al. (2018), also asserted that factors such as job opportunities and career development play an important role in students' career selection decisions in which gender is not a significant factor. In the context of industry development, more and more emphasizes are placed on the aspect of sustainability. Therefore, understanding and acceptance of green TVET are becoming increasingly important. Awareness of green TVET can help in taking more effective development measures, ensuring the marketability of green TVET graduates in today's job market.

(iii) Difference in Attitude

Within the context of students' attitudes, significant differences between male and female was discovered and this difference might be influenced by environment and personal experience. The study of Harman et al. (2010) shows that direct experience with green TVET practices can nurture positive attitudes. Male students may be more involved in training programs or green TVET projects, giving them more positive attitudes than female students who may be less involved.

In conclusion, differences in awareness, acceptance, and attitude towards green TVET based on gender can be explained through factors such as family influence, perception of career importance, and personal experience. Therefore, the education and engagement strategies of students, especially female students, need to be paid attention to ensure equality in awareness, acceptance, and attitude towards green TVET among students.

4. Conclusion

In conclusion, the analysis of the findings of the study shows that students in the field of TVET show a very high level of awareness, acceptance, and attitude towards the implementation of Green TVET. By involving a total of 165 students, with 53.3% male and 46.7% female, providing an overview concerning TVET students's awareness on green TVET, the acceptance of green TVET among TVET students, as well as TVET students' attitude towards the green TVET implementation.

In this research, the overall level of awareness and acceptance does not show a significant difference between male and female students, however there is a significant difference in students' attitudes towards the implementation of Green TVET. Male students show more positive attitudes than female students. Therefore, TVET institutions should take pragmatic action and initiatives to ensure female students possess positive attitude towards green TVET.

There are several limitations in this research. First, this research was conducted in UTHM, involving UTHM students only. Therefore, the findings do not reflect all TVET institutions in Malaysia. Secondly, the data were collected using questionnaire only which means the findings are very superficial and do not provide in-depth insights regarding students' perceptions on green TVET. Thirdly, the participating students in this research were solely taken from one single faculty which means the findings were not reflective of the TVET students' opinions.

These limitations invite further research in order to generate more holistic findings in which the findings can be more beneficial to TVET community, policymaker, TVET educators, and TVET institutions.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

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