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The Readiness of Secondary School Teachers for Sustainable Oil Palm Themed-based Teaching and Learning

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ABSTRACT

Numerous educational programs were introduced to create awareness and interest in Malaysian oil palm industry among students. However, to date, those programs were only conducted informally via campaigns run by the industry players. For that reason, this study is being carried out to identify and ascertain whether school teachers are prepared to introduce a new education program on 'Sustainable Oil Palm Industry' to be implemented as part of formal education in lower secondary schools. Following this, 421 lower secondary school teachers were surveyed with questionnaires distributed online through media social. The collated information and data were studied descriptively to establish its frequencies, percentages and mean values. The findings of this analysis show that the level of preparedness of the teachers in terms of related knowledge is considered at 'moderate level'. It was also found that to be successful in the implementation of this program, teachers need to be provided with sufficient information and knowledge in this particular subject. In addition, adequate trainings and teaching aids should also be provided in line with the requirements of the existing school curriculum.

Keywords: knowledge, pedagogy, sustainable oil palm industry, teachers' readiness.

INTRODUCTION

The United Nations summit has initiated the 2030 Agenda for Sustainable Development which outlined 17 Sustainable Development Goals reflecting the ambitious global vision towards creating a sustainable future (United Nations, 2015). Specifically, this agenda focuses on five areas: People, Planet, Prosperity, Peace and Partnership. According to Lim (2017), the oil palm industry has achieved seven out of seventeen goals. These goals include, (i) Goal No. 1: No Poverty – by reducing rural poverty in top producing countries, (ii) Goal No. 2: Zero Hunger – by increasing income to buy better food, (iii) Goal No. 3: Good Health and Well-being – by bringing crucial development into rural areas, (iv) Goal No. 4: Quality education - by increasing the quality of education especially in the rural area, (v) Goal No. 8: Decent Work and Economic Growth – by creating

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jobs in palm oil processing, R&D, trading and logistics (vi) Goal No. 10: Reduced Inequalities - between urban and rural populations, and (vii) Goal No. 13: Climate Change – by storing and sequestering carbon which helps to mitigate climate change.

Since the first oil palm plantation was established more than 100 years ago, the oil palm industry has played an important role in Malaysia's economic and socio-economic development (Moslim, 2018). Oil palm has been widely grown throughout the country, where its total plantations in 2020, occupied an estimated 5.87 million hectares of land, equivalent to 17.89% of the country's land area (Arshad, 2021). Over the years, Malaysia has become the second-largest exporter of palm oil after Indonesia, contributing 33% of the value of world palm oil exports (MPOC, 2019). However, the Malaysian oil palm industry is often challenged by other vegetable oil-producing countries. Furthermore, the industry has also received intense criticism from western countries claiming that the Malaysian industry is not sustainable. The most serious allegation claim is oil palm plantations have caused environmental problems, such as deforestation and serious air pollution due to open burning (Hafizuddin-Syah *et al.*, 2018).

In 2020, several non-governmental organisations (NGOs) have filed petitions to the United States Department of Customs and Border Protection (USCBP) over the claim of forced labour in the Malaysian plantations. Over the last few years, Malaysian oil palm plantations have been involved in several controversial issues involving foreign workers, such as the increased risk of social problems, illegal settlements, excessive working hours, occupational safety and health hazards, and the trafficking of migrant workers, which raised doubts over the sustainability of the Malaysian oil palm industry (Maros *et al.*, 2019). As a result, palm oil products produced by several large plantation companies in Malaysia have been subjected to export restrictions due to the forced labour issues (Arshad, 2021). These restrictions have tarnished the image of the Malaysian palm oil industry.

In the meantime, although Malaysia is well known for its oil palm industry, the level of knowledge and awareness among Malaysians, especially the younger generation, on this industry is still relatively low. This situation invites various negative perceptions about the industry, either from within the country or abroad. Most Malaysians have limited knowledge and exposure about careers in the industry as they consider the industry is only about hard labour in the field (Jusoh *et al.*, 2017; Maros *et al.*, 2019; Saad *et al.*, 2016). Studies have found that school students show moderate interest in careers in the oil palm industry (Jusoh *et al.*, 2017), while Maros *et al.* (2019) found that teenagers perceive working in the industry as non-ideal. In this light, Saad *et al.* (2016) stressed that more exposure to the oil palm related sector is important in shaping a positive attitude about this industry among youths. Selvadurai *et al.* (2012) also suggested that proper steps should be taken by the authorities to change the perception of youth towards this industry to reduce dependence on foreign labours.

Adequate and accurate information regarding career prospects in the oil palm industry would help motivate students to engage in the agricultural field, especially oil palm plantation (Jusoh *et al.*, 2017). Therefore, access to education and new forms of agriculture-based enterprises can boost youth's participation in farming innovations that could increase family income and improve the livelihood of farmers and local communities (Saad *et al.*, 2016). Past studies suggest that oil palm industry themed educational programs to be implemented in schools to provide students with comprehensive exposure to the industry.

To date, several educational programs related to the oil palm industry were provided by the stakeholders focusing mainly for students. However, similar programs tailored for the teachers have not been given emphasis. To accomplish the aspirations of an excellent educational program, each step in the planning and implementation must be based on vision to create a constant change or paradigm shift in the thinking processes and how things get done. These actions require the involvement of the entire organisation including the educators. Being the chief support of the education system, teachers are the backbone to implement and succeed in any educational reform or changes made in policies. As such, efforts should be carried out to improve the professionalism of educators in order to achieve specific goals in educational program implemented (Said and Talib, 2000).

In line with the 21st century education skills requirements, teachers should familiarise themselves in culture knowledge environment. The teachers are the role models and should set good example by practicing lifelong learning as an ongoing pursuit of knowledge to enhance themselves. They are also in the best position to similarly encourage their students to acquire knowledge as life skills instead of acquiring knowledge just for the sake of knowledge or passing examinations. The country needs teachers with great wisdom and able to organise teaching and learning strategies that can nurture the culture of problem solving among

their students. In line with these requirements, relevant training should be given periodically and continuously by the administration to ensure that teachers have sufficient knowledge and skills to achieve any goal in educational program organised (Abdul Ghani *et al.*, 2019).

With regards to the above, this study is also aimed at ways to obtain views and inputs from teachers in several aspects of developing an effective teaching module on this specific theme; Malaysian Sustainable Oil Palm Industry. This theme will cover various aspects related to the sustainable oil palm industry including the history of the Malaysian oil palm industry, sustainability, economy, biodiversity, palm oil products, agencies and careers related to this industry. In the end, it is envisaged that the development of this module would be able to assist the teachers in introducing the subject matter to the lower secondary level students effectively and successfully.

In this light, this study aims to address questions like 'are teachers ready to implement sustainable oil palm-themed teaching and learning? 'What is the level of teachers' knowledge of the sustainable oil palm industry?' 'What are the teachers' suggestions for implementing the industry themed teaching and learning in schools?' and 'What are the possible challenges teachers faced in implementing teaching and learning activities related to the industry in schools? In this light, this study aims to identify secondary school teachers' readiness to facilitate sustainable oil palm industry-themed teaching and learning activities.

METHODOLOGY

This study used survey which is part of the quantitative research method. Data were collected using a survey questionnaire distributed through the Google Form application. According to Creswell (2014), an online survey could collect vast data quickly and ensure a high rate of responses. Studies also posited that a web-based survey research is cost-effective and helps researchers gather data faster from a widerpool of respondents. Furthermore, web-based surveys allow researchers to transfer survey responses directly into a database, eliminating transcription errors and preventing changes by survey respondents (Andrews *et al.*, 2003).

Population and Sample

The study population comprises lower secondary school teachers, who are involved in teaching lower secondary students of Form 1, Form 2 and Form 3. The questionnaires are only distributed specifically to teachers who teach lower secondary level only because at the lower secondary level there was more breakdown of subjects related to the theme of sustainable oil palm industry compared to the primary school level. Questionnaires were distributed randomly through social media platforms like WhatsApp, Telegram and Facebook. According to Fricker (2012), the simple random sampling method is most suitable for online survey studies involving large homogeneous groups. After being online for a month, only 421 teachers from all over Malaysia have responded. The number of samples in this study fulfilled with the minimum number recommended by Krejie and Morgan (1970) of at least 384 samples for a survey study of a population of over 100 000 people (Chua, 2012).

Research Instrument

The research instrument is a set of questionnaires containing four sections. Part A contains five items on the respondents' demographic information; Part B contains 20 items on teachers' readiness regarding their knowledge of the Malaysian oil palm industry. Meanwhile, Section C contains 12 items on teachers' readiness based on oil palm-themed teaching and learning pedagogical aspects. Items in Sections B and C used a 5-point Likert scale to measure teachers' level of readiness. The 5-point Likert scale was chosen because of its high reliability value. The scale could also help the respondents make the right choice based on the extent of their agreement with the statement in each item (Mohd Majid, 2005). Finally, section D contains two open- ended questions on teachers' suggestions and challenges in implementing oil palm-themed teaching and learning activities. This questionnaire has undergone review and refinement and has obtained language validity and content validity from three panels of experts in related fields. The findings of the pilot study analysis found that the reliability value referring to the Cronbach's Alpha value is 0.96 which indicates that the instrument is in very good condition and effective with a high level of consistency and can be used in real research (Bond and Fox, 2015).

Data Analysis

The data obtained from this study were analysed descriptively using Microsoft Excel software and the Statistical Packages for the Social Sciences (SPSS) version 25.0. All the findings are presented in the form of frequency, percentage, mean and standard deviation.

RESULTS AND DISCUSSION

The findings of this study are divided into four parts, namely the respondents' demographic information, the level of teachers' readiness, perceived challenges and proposed teaching activities.

Respondents' Demographics

The sample of this study consists of 421 lower secondary school teachers from all over Malaysia. 78.6% of the respondents are female teachers, while only 21.4% are male teachers. On the other hand, 52.7% of the respondents are from urban areas, and the majority of respondents (67.7%) have been teaching for more than ten years. *Table 1* shows the respondent's demographic profile. The highest number of respondents are from the Middle Zone, namely from Selangor, the Federal Territory of Kuala Lumpur and the Federal Territory of Putrajaya (*Figure 1*).

The Level of Teachers' Readiness

This study aims to identify the level of readiness of teachers from their knowledge of the Malaysian oil palm industry and their readiness to implementeducational programs related to the sustainable oil palm industry (*Table 2*). Findings show that teachers' readiness in terms of knowledge is at a moderate level (Mean = 3.27, Standard deviation = 0.75). Similarly, teachers' level of readiness from the pedagogical point of view is also at a moderate level (Mean = 3.38, Standard deviation = 0.77).

Teaching is a knowledge-rich profession, and teachers play the role of 'learning specialists.' As professionals, teachers are expected to process and evaluate new knowledge relevant to their core professional practices and regularly update their knowledge to improve their practice and meet new teaching demands. Empirical research on teachers' knowledge in decision-making asserted that to make informed pedagogical decisions. Teachers must be able to analyse and evaluate specific learning episodes in combination with contextual and situational factors and connect all this information to their pedagogical and content knowledge to guide subsequent teaching actions. Thus, making good pedagogical decisions

TABLE 1. RESPONDENTS' DEMOGRAPHIC PROFILES

Item	Factors	Features	Frequency	Percentages (%)
A1	Gender	Male	90	21.4
		Female	331	78.6
A2	School location	Urban	222	52.7
		Rural	199	47.3
A3	Teaching experience	Less than 1 year	7	1.7
		1-5 years	57	13.5
		6-10 years	72	17.1
		More than 10 years	285	67.7
A4	Teaching field	Language	97	23.0
		Science and Mathematics	157	37.0
		Humanity	123	29.0
		Technic and Vocational	44	10.0

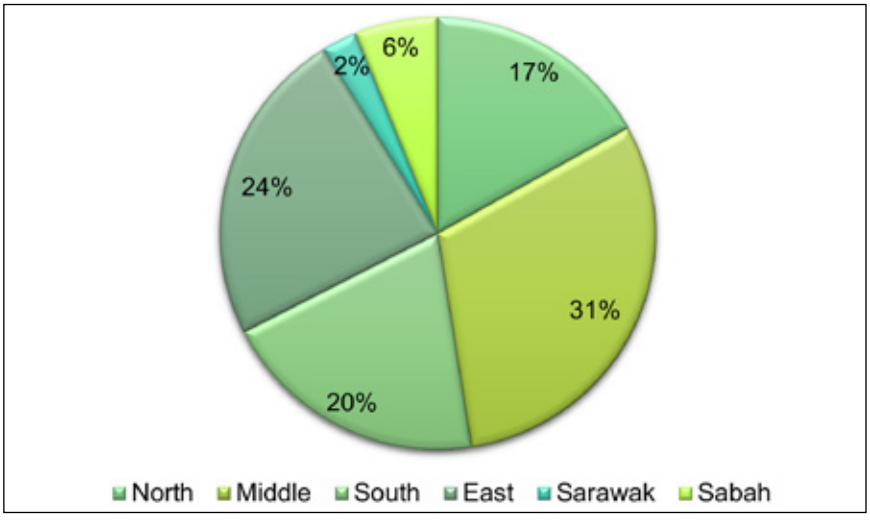

Figure 1. Percentage of respondents by zone.

TABLE 2. LEVEL OF TEACHERS' READINESS IN TERMS OF KNOWLEDGE AND PEDAGOGY

Factors	Mean	Standard deviation	Mean interpretation
Knowledge	3.27	0.75	Moderate
Pedagogical	3.38	0.77	Moderate

hinges on the quality of the level of teachers' pedagogical knowledge. In other words, what teachers do in classrooms is very much dependent on what they know and believe about and on what they understand about the teaching and learning process (Anthony and Walshaw, 2007).

Successful teachers are those with both the intention and the effect to assist students (Jaworski, 2004). A teacher with merely the intention of developing student understanding will not necessarily produce the desired effect. However, what is clear is that repertoires of sound content knowledge and pedagogical knowledge will provide the means to achieve targeted goals. The argument above states that teachers' conceptual understanding and knowledge in sustainable oil palm industry is critically important at any level to ensure the effective delivery of knowledge. Teachers who are unclear about particular concepts may struggle to teach these concepts and may resort to examples that hinder, rather than help, students' development. Teachers' limited knowledge could also create a misunderstanding among students, which could eventually cause them to give inappropriate or unhelpful feedback to students. In short, teachers' poor subject knowledge could be the main barrier to effective learning activities, hindering students' understanding of the issue. Thus, teachers should be flexible and be on the lookout for opportunities to improve students' understanding. When teachers use their knowledge to enhance student learning, they are engaging in effective practice. In addition to building students' understandings, teachers could also add value to the wider community of individuals.

Six difference themes of questions on sustainable oil palm industry were asked for the purposes of identifying the levels of knowledge and understandings of the teachers in this study. The analysed data as shown in the *Table 3* reveals that the teachers have sufficiently high knowledge and ideas about the importance of oil palm industry from economic point of view. While the level of knowledge on oil palm superiority and other relevant issues are relatively lower, or at moderate high. The findings however, indicates that the level of awareness in the history and the sustainability of Malaysian oil palm industry is considerably low. Notwithstanding that, the overall results of this study would still be a valuable source of reference for the researchers to determine the most suitable topics to be introduced in the process of developing a program related to sustainable oil palm industry, later on.

Teacher Challenges in Implementing Thematic Teaching and Learning related to Sustainable Oil Palm Industry in Schools

This study also focused on the challenges faced by teachers in implementing sustainable oil palm themed teaching and learning activities in schools. The findings indicated that 39.7% of the respondents stated that the lack of knowledge related to the sustainable oil palm industry as the major challenge. This is followed by time constraints, infrastructure, curriculum content, school location, students' interest, teachers' interest and school administrators' involvement. *Table 4* shows challenges in implementing teaching and learning related to sustainable oil palm in schools. These findings support the study that was conducted by Retnawati *et al.* (2017) who stated that among the challenges of teachers in implementing thematic teaching is the teacher's understanding of a theme, curriculum implementation and assessment methods according to the proposed theme. In this regard, exposure during undergraduate studies, pre-service teacher training, and in-service professional development could help improve knowledge. This finding open up opportunities to look into these factors as the knowledge outcomes of these three phases of teacher growth have been under-examined, especially concerning the articulations between them.

Recommended Teaching and Learning Strategies

The questionnaire also asked teachers about the recommended

TABLE 3. LEVEL OF TEACHERS' KNOWLEDGE BY THEME

Themes	Mean	Standard deviation	Mean interpretation
Economic interests	4.02	0.84	High
Advantages of oil palm	3.74	0.61	Moderately high
Relevant agencies	3.56	1.02	Moderately high
Issues related to Malaysian oil palm	3.29	1.05	Moderately high
History of the Malaysian oil palm industry	2.91	1.11	Moderately low
Sustainability	2.88	1.08	Moderately low

TABLE 4. CHALLENGES IN IMPLEMENTING THEMATIC TEACHING OF SUSTAINABLE PALM OIL INDUSTRY IN SCHOOLS

Statements	Frequency	Percentage (%)
Lack of teachers' knowledge on the sustainable oil palm industry	167	39.7
Time constraints to implement teaching and learning of major subjects	107	25.4
The lack of school infrastructure and facilities	42	10.0
Topics on palm oil/ oil palm are not aligned with the curriculum content of the main subject	41	9.7
The location of the school is far from an oil palm plantation	31	7.4
Students are not interested in learning about oil palm/ palm oil	19	4.5
Teachers are not interested in implementing sustainable oil palm themed teaching and learning activities	13	3.1
School administrators give less emphasis on oil palm-related teaching and learning	1	0.2

approaches to implement sustainable oil palm-themed education programmes in schools. There are two teaching and learning strategies that are the main choice of respondents, namely teaching outside the classroom and project-based learning. The results showed that 33.7% of the respondents chose learning outside the classroom as the most appropriate strategy for implementing sustainable oil palm themed education programs (*Table 5*).

Learning outside the classroom refers to the use of places other than the schoolfor teaching and learning. This concept concerns getting children and young people tolearn outside the classroom and providing them with challenging, exciting, and different experiences to make the lesson memorable. Learning could be done in various locations to provide students with concrete understanding. Furthermore, this approach provides real-world learning experiences that will set them up for success inlife beyond school. On the other hand, learning outside the classroom experiences differs from conventional teaching methods. Students are encouraged to engage a broader range of soft skills such as teamwork, leadership, and understanding of theirlearning environment. Studies have advocated that learning outside the classroom lead to a deeper understanding of challenging concepts and provide a context for learning in many areas. The results of Andjelkovic and Prnjat (2017) study show the benefits of integrated teaching implemented outside the classroom increase knowledge retention and improving the quality of student knowledge and creating an adequate social climate for sustainability, interdisciplinary studies and the use of natural and social contexts as teaching and learning resources. Students who experience learning outside the classroom benefit from increased self-esteem and become more involved in their learning. Lastly, evidence suggests learning outside the classroom can help improve achievement, classroom behaviour and students' engagement, including those facing difficulty engaging in the learning activities (Idros, 2011).

Nevertheless, 33% of respondents chose project-based learning (PBL) strategies as an appropriate strategy for implementing these learning activities in schools. PBL is a type of approach that requires students to deal with problems in the production of products as learning artifacts. Through the production of these artifacts,the student acts as a problem solver, decision maker, inventor and researcher. It is atype of inquiry learning that is open-ended and motivated by a student's curiosity (Mioduser and Betzer, 2008). Through project-based learning, students seek toanswer questions involving a principle or theory of a discipline (Thomas, 2000).

TABLE 5. RECOMMENDED TEACHING AND LEARNING STRATEGIES

Statements	Frequency	Percentage (%)
Outside the classroom	142	33.7
Project based	139	33.0
*STEM approach	53	12.6
Fun learning	30	7.1
Inquiry based	27	6.4
Cooperative	18	4.3
Problem based	7	1.7
Case study	5	1.2

Note: * STEM - Science, Technology, Engineering and Mathematics.

Many studies have proven the advantages of PBL over conventional learning methods, among which students involved with PBL are more responsible for their learning (Boaler, 1997; Penuel and Means, 1999). PBL also increases student attendance to school (Thomas 2000) because PBL activities motivate them which in turn can improve student achievement (Geier *et al.*, 2008; Gültekin, 2005; Thomas, 2000). PBL can be applied by teachers to encourage the active involvement of students because the PBL approach is student-centered where students are fully involved to succeed in project assignments. Through PBL also students gain more exposure to high-level thinking, problem solving skills, cooperation and communication skills (Chanlin, 2008; Mioduser and Betzer, 2008). *Table 5* shows the recommended teaching activities for implementing sustainable oil palm thematic teaching in schools.

CONCLUSION

This study suggests that early exposure to the oil palm industry, particularly at the school level, is essential to attract the younger generation to venture into the industry's sustainability. Accordingly, teachers need to be equipped with knowledge related to the sustainable oil palm industry to effectively facilitate oil palm-based learning activities. Chen (2012) states that teachers should have strong and powerful materials, they should realise ideas and topics that will be implemented in the teaching and learning processes and they should understand how well they teach concepts to their students. The findings of this study has contributed to the researchers ideas in developing an appropriate teaching module on this theme to be implemented in secondary school. The teachers in the survey are of the view that, the teaching module should be equipped with as much information as possible relevant to the industry's theme. The development of the module should also be in line with content of the existing school curriculum as the teachers are required to achieve the relevant Content Standard and Learning Standard sets by the Ministry of Education. This is to ensure the dissemination of information is effective and meaningful. Based on the Curriculum and Assessment Standards Document, there are five main potential subjects which this module can be incorporated in. They are Geography, History, Science, Health Education and Moral Education. The teachers also suggested to apply the outside classroom learning method for this particular module. The implementation of project-based strategies, on the other hand, are suitable to be applied in or outside classroom. Providing training programs for teachers and making teaching aids related to the sustainable oil palm industry accessible are equally important due to teachers' role in improving the students' perception of the industry in Malaysia.

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