CULTIVATING TEACHERS' CREATIVITY TOWARDS EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) IN TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET)

[*]Suhaizal Hashim, Nur Zulaikha Mohd Zain & Nur Zahira Mohamed Zahir

Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia, 86400, Parit Raja, Batu Pahat, Johor, Malaysia.

[*]Corresponding author: suhaizal@uthm.edu.my

ABSTRACT

Background and Purpose: Education for Sustainable Development (ESD) aims to empower individuals with the competencies to reflect on their actions and contribute to sustainable development. Despite ongoing efforts, government initiatives remain insufficient, and the integration of ESD issues, perspectives, and skills into various curriculum components is still unclear. This study investigates the relationship between components of creativity and the pedagogical practices of ESD among teachers.

Methodology: A quantitative research design was employed, utilizing a survey method to collect data from 98 teachers at Technical and Vocational Education and Training (TVET) institutions in Johor. A structured questionnaire was distributed, and the data collected were analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. Descriptive statistics were used to assess the levels of creativity components and ESD pedagogical practices, while the Spearman correlation was applied to determine the relationship between these variables.

Findings: The results indicate that teachers at TVET institutions exhibit high levels of creativity components and ESD pedagogical practices. Spearman correlation analysis revealed a significant positive relationship between creativity components and ESD pedagogical practices, with a correlation coefficient of $r = 0.724$ and $p = 0.000$ ($p < 0.05$). The findings highlight that teachers' creativity strongly influences their pedagogical practices for ESD, as creativity enhances their environmental awareness and commitment to sustainable development, aligning with national educational goals.

Contributions: This study establishes that creativity significantly impacts the pedagogical practices of ESD among teachers in TVET institutions. The findings underscore the importance of fostering creativity to improve ESD implementation, supporting educators in promoting sustainable development and achieving national education objectives.

1.0 INTRODUCTION

According to UNESCO (2017), Education for Sustainable Development (ESD) is integral to national education policy. In 2012, 33% of reporting countries conveyed that ESD was compulsory in the curriculum, indicating the importance and visibility of ESD in national education policy. ESD is an interdisciplinary learning method covering social, economic and environmental aspects in the formal and informal curriculum. The program funded by the Manitoba government requires the involvement of schools, teachers, students, parents, the community, and researchers from various disciplines, besides the public, to be involved in sustainable development activities. Other than that, ESD is commonly understood as education that encourages knowledge, skills, values and attitudes to enable a more sustainable and just society for all (Leicht, Heiss, & Byun, 2018). ESD aims to develop competencies that enable and empower individuals to reflect on their actions. ESD should be understood as an integral part of quality education and lifelong learning (Rieckmann, 2018).

Throughout history, pursuing a well-balanced life has been debated and has become primary in the global conference's dialogues. Peace, freedom, development, and environment were the initial preferences set as life's key themes (Wolff et al., 2017). While many nations worldwide have recognized the need for education to achieve sustainability, little progress has been made today. This is because a few major issues have limited the advancement of ESD. One of the issues is the lack of awareness of the importance of ESD within an educational institution. It is crucial to develop awareness among practitioners of education because some are unaware of the critical linkages between education and sustainable development (Jasmi & Kamis, 2019). According to Kandangama (2018), the barrier to cultivating ESD among

teachers and students is that educational institutions do not cultivate ESD as a crucial element in teaching and learning.

ESD was first formally implemented in the school system in Malaysia in 2001 through the Sustainable Environmental Award Program (SLAAS) in line with the goals of the National Environmental Policy and the international movement UN-DECADE (2005-2014) (Mahat & Idrus, 2017). Through the SLAAS Program, exposure to ESD and the activities that can contribute towards it can be delivered by teachers in a planned program. Besides, it is clear that embedding ESD values within primary and secondary education curricula yields positive results on the students both in the short and the long term as it enhances their behavior towards their environment and their community, helps them acquire more citizenship values, and make them equipped with more sustained mindsets and skillsets (Zguir, Dubis, & Koç, 2021). Furthermore, Ab Majid and Ismail (2018) also state that teachers in Malaysia have good knowledge of information and communications technology (ICT) and are very good at teaching creativity, and a moderate positive linear relationship exists for fostering creativity behaviour with 21st-century classroom management.

Creativity can also enhance ICT teachers who consider integrating it into their teaching as expensive and less helpful, especially in an environment that lacks the resources needed to support digitization. Creativity in teaching involves using innovative pedagogical approaches, strategies, methods, and collaborative skills. Previous studies have not shown any results regarding a set of structured interview questions conducted on Technical and Vocational Education and Training (TVET) program teachers selected to obtain perceptions of creativity and sustainability in TVET programs. According to Mahat et al. (2016), knowledge of implementing sustainability activities helps individuals gain various experiences and basic understanding to ensure environmental sustainability. Increasing the level of knowledge about the environment can form a positive attitude towards the environment (Qian, Yu, & Gao, 2021).

However, many teachers view participation in community-based activities as a waste of time, which can lead to poor performance by students and schools in general (Wanjala & Osendo, 2019). Creativity is often paid lip service, but most schools are currently experiencing a creativity gap, with significantly more creative activity occurring outside of school. Numerous psychologists argue that creativity is not just an enrichment or add-on in the classroom. It is a definable, measurable, psychological skill set that enhances learning and will be necessary in the 21st-century workforce (Short & Keller-Bell, 2021). The concept of creativity in education is constructed based on the sociocultural context in which creativity is practised (So & Hu, 2019). In solving the shortcomings and constraints in implementing ESD,

other alternatives can be nurtured through TVET teachers' creativity. Samsudin, Hassan, and Hasan (2014) stated that applying sustainable development elements in the education and technology system is very important. Due to the changes in the industrial world, TVET institutions need to deeply understand the theory and practice of sustainable development in the 21st century (Chinedu, Wan Mohamed, & Ogbonnia, 2018).

TVET providers should provide a curriculum that focuses on technical and vocational skills and needs to be balanced with sustainability values. Therefore, teachers' competence in deliberating the ESD element is very important in order to stretch awareness among their students (Chinedu et al., 2018). Various initiatives have been implemented to drive Malaysia towards becoming a high-income and developed economy in the future (Mokshein, 2019). Thus, the goal remains through the availability of highly skilled human capital as high-income economies' efforts. In this context, TVET providers play an important role in providing the skilled workforce needed for National Economic Transformation. The Malaysia Ministry of Education (MOE) recognizes the importance of TVET programs and curricula in achieving its goals and aspirations to become a developed country (Azizan, Pangil, & Zin, 2021). Consequently, teachers in TVET programs should have high skills and creativity to produce sustainable graduates.

However, the awareness of ESD concepts among teachers was still low, and there were difficulties in including ESD programs in the timetable besides obstacles in carrying out ESD programs due to lack of funds (Martin, Suryadi, & Juandi, 2019). In addition, the lack of teachers' creativity during teaching and learning impedes cultivating ESD (Ilovan et al., 2019). Several factors can drive TVET teachers' creativity if they eventually apply it to foster ESD pedagogical practices. Besides, some studies show that the development of significant teacher creativity can be a reference for TVET teachers. Ab Halim et al. (2020) state that TVET institutions can further encourage the widespread use of Augmented Reality (AR) as their study showed that lecturers' knowledge level of AR technology is high. AR can provide additional information to students, which can be displayed as a multimedia element and a new technology in Malaysian education (Bistaman, Idrus, & Abd Rashid, 2018). Thus, AR technology can help develop creativity in learning. Other than that, the Torrance Tests of Creative Thinking version is a valid and reliable data collection instrument for research on creativity, innovation or higher thinking skills involving TVET respondents whose mother tongue is Malay (Madar, Chew, & Hamid, 2019).

Some problems were experienced by TVET institutions through the implementation of ESD. Roofe and Ferguson (2018) explain that outcomes are important for everyone, ensuring

harmony between people and the planet and securing an excellent future for future generations. Also, based on the analysis, it is felt that the curriculum is less aligned between the components (objectives, content, learning experience, assessment, teaching strategies) that reflect ESD content, and there is a need to integrate more such content in the curriculum to ensure that TVET and ESD provide related benefits. Therefore, ESD in the TVET program needs to overcome the gap or missing link (Pavlova & Chen, 2019).

In dealing with ESD problems from the government, some researchers say there is a significant development in ESD. Experts have recommended that ESD be effective, and its intended purpose should be thoroughly integrated into the curriculum and practice of the institution (Chinedu et al., 2018). The attitude of Malaysian Teacher Education Institute (IPGM) administrators towards implementing ESD is at a high level as a whole. These findings have positive implications, and the program should be implemented in the future (Ellappan, Mahat, & Nayan, 2018). Besides, integrating the knowledge system and skills should be transparent without unconsciously committing a dichotomy of knowledge (Rekan, Kasim, & Yusoff, 2019).

TVET teachers will be responsible for training employees and developing their skills and abilities to work as needed to improve community well-being and community development. Teachers with good creativity can translate ESD into the methods and approaches used to orient ESD elements in the TVET curriculum involving students, lecturers, administration, and policymakers (Albareda-Tiana, Vidal-Raméntol, & Fernández-Morilla, 2019). Thus, this study aims to identify the level of creativity component, the pedagogical practice of ESD and the relationship between creativity components and the pedagogical practice of ESD among teachers in TVET institutions in Johor, Malaysia. Furthermore, this research tends to study the significant difference between teacher creativity components in the pedagogical practice of ESD through the following hypothesis:

H_a: There is a statistically significant linear relationship (correlation) between the creativity components with ESD pedagogical practice among teachers in the TVET institution.

H_o: There is no statistically significant linear relationship (correlation) between the creativity components with ESD pedagogical practice among teachers in the TVET institution.

The extent of ESD pedagogical practice among Technological in TVET academics is an educational mission to balance human well-being and economic development with cultural traditions and respect against natural resources and the environment.

2.0 LITERATURE REVIEW
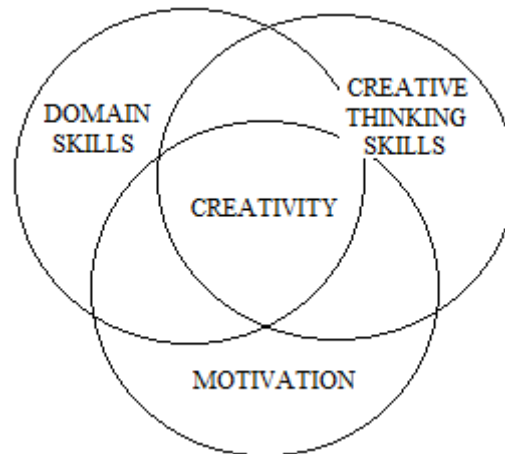
2.1 Amabile Creativity Model

Figure 1: Amabile creativity model (Amabile, 1988)

The Amabile approach stems from a clear and explicit theoretical creativity model, as in Figure 1. The first component of creativity in the Amabile Model adopted in this study is the domain of skills. Domains have a startup that is used to get the effect of a functional instance. Domain-specific knowledge is most likely emphasized by most conservatory educators in most centralized institutions, with little effort to prepare domain-general learning. It is a form of education and training designed to meet the economic needs of young and adult people who want to learn job skills and work to improve their standard of living.

Creative thinking skills are the second component of creativity in the Amabile Model adopted in this study. This whole creative thinking about the appropriateness of differences helps students see how critical thinking is. Creative and higher-level thinking skills developed the goals of the FSP program through systematic problem-solving methods (Cramond & Fairweather, 2013). Integrating ESD into TVET programs based on teacher creativity is vital to acquiring information, including experiences promoting business growth and allowing characters to change their everyday experiences. The third component of creativity in the Amabile Model adopted in this study is motivation. One of the collections from primary motivation modules regulating government operations, including control-related behaviors is

considered to have theoretical and empirical reasons. A person's urge to achieve any particular purpose affects individual circumstances, including situational parts, everyday actions and consequences.
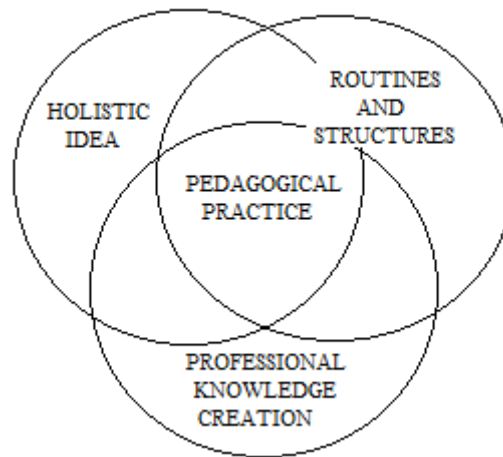

Figure 2: Interpretation of the Scherp model (Mogren et al., 2019)

Mogren and Gericke (2019) explain that the Scherp Model, as depicted in Figure 2, is based on an analysis of school organization within a structured framework, including a broad Education for Sustainable Development (ESD) approach at the institutional level. With the implementation of the Sustainable Development Goals (SDGs), UNESCO and other international organizations have advocated for the empowerment of youth in integrating SDGs into the educational process (Albareda-Tiana et al., 2018).

The holistic idea is the first pedagogical practice of ESD in the Scherp Model, as adopted in this study. A holistic approach, for example, is evident in healthcare, where emphasis is placed on the well-being of the entire body and mind rather than on isolated body parts. Mogren and Gericke (2019) further assert that ESD should be embedded in a school's vision and holistic ideology to prevent neglect in its implementation. This perspective is influenced by the phenomenological viewpoints of Brentano and Husserl, as well as descriptive psychology, which was favored by early Gestalt theorists due to its focus on the 'immediately given' spatiality in unified consciousness (Smith, 2020).

The second pedagogical practice of ESD in the Scherp Model, as incorporated in this study, is routines and structures. For effective implementation, teachers must develop creative routines and structured teaching methodologies while being exposed to a variety of techniques,

activities, strategies, approaches, and skills. These pedagogical elements are essential in ensuring that students engage in continuous learning and development.

The third pedagogical practice of ESD in the Scherp Model adopted in this study is professional knowledge creation. This approach emphasizes the need to equip teachers with research skills and promote their roles as research practitioners. It suggests the creation of opportunities for professional development, the establishment of academic networks for knowledge validation and auditing, the development of mentorship programs to facilitate knowledge sharing, and the enhancement of teacher collaboration as part of internal reflective practices. These initiatives collectively contribute to strengthening teacher knowledge creation and advancing the effectiveness of ESD implementation.
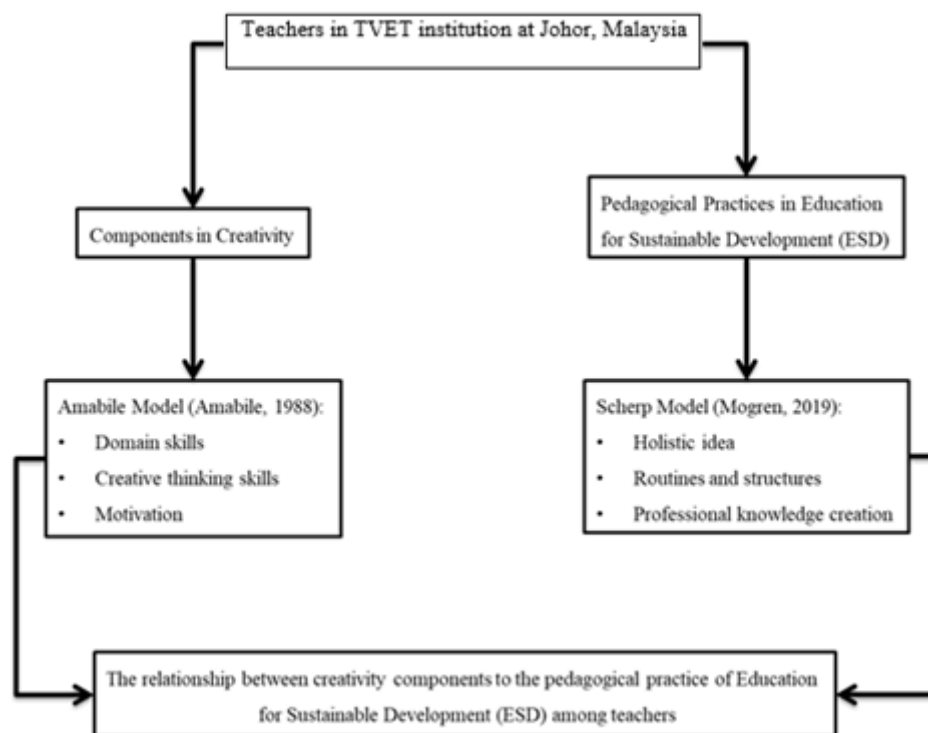
Figure 3: Conceptual Framework for the study

The conceptual framework presented in Figure 3 illustrates the analytical tool, incorporating various contextual adaptations. This study focuses on respondents who are teachers in Technical and Vocational Education and Training (TVET) institutions in Johor, Malaysia. The Amabile Model, which conceptualizes creativity within organizational settings (Jessurun, Anthonio, & Weggeman, 2020), underscores the importance of creativity in the evolving digital

era, particularly within the TVET sector (Douse & Uys, 2019). This model comprises three key components: domain-relevant skills, creative thinking skills, and intrinsic motivation.

Additionally, the Scherp Model was employed to assist researchers in developing research instruments. This model serves as a framework for evaluating the transformation process used to assess different types of Education for Sustainable Development (ESD) implementation (Mogren & Gericke, 2019). As noted by Mathie (2019), this model is grounded in a holistic approach that integrates ideas, routines, structures, and professional knowledge creation.

Upon determining the levels of the two key variables in this study, the researcher will ultimately analyze the relationship between the components of creativity and the pedagogical practices of ESD among TVET teachers.

3.0 RESEARCH METHODOLOGY

According to Sekaran and Bougie (2016), research design is an action plan for systematically collecting, measuring, and analyzing data based on the research questions. Furthermore, research design involves a series of rational decision-making processes and should be structured to ensure clarity and ease of understanding. A well-defined study plan provides a structured approach that bridges research questions with the implementation and execution of the research process. To achieve the stated objectives, the researcher must obtain results and insights into the relationship between teachers' creativity components and their pedagogical practices in Education for Sustainable Development (ESD) within a TVET institution in Johor.

This study employs a quantitative approach to derive conclusive and statistically validated evidence. The analysis aims to identify the most dominant creativity components among teachers and assess the level of pedagogical practice in ESD, with the pedagogical practice of ESD teachers serving as the dependent variable (Mohammad & Othman, 2018). A quantitative methodology minimizes errors by addressing significant research challenges while offering multiple data analysis options (Curtis, Comiskey, & Dempsey, 2016).

Additionally, this research adopts a survey design, which is recognized as an effective data collection method for achieving the study's objectives. The random sampling technique was employed, as it ensures that every individual in the population has an equal probability of being selected, thereby enhancing the representativeness of the sample (Stehman & Overton, 2020).

A questionnaire was used as the primary data collection instrument in this study. This method was chosen due to its suitability for addressing the research questions and objectives,

as well as its standardized format, which facilitates ease of administration (Ahmad et al., 2019). Additionally, questionnaires ensure uniform interpretation among respondents, thereby enhancing the reliability and consistency of the collected data.

3.1 Research Procedure

The research process is structured into three distinct phases to ensure a systematic and rigorous approach. The first phase begins with the initiation of the study, which involves selecting a research topic and formulating the problem statement. The problem statement includes identifying the research problem, defining the research objectives, and developing the corresponding research questions. Subsequently, a systematic literature review is conducted to gather and analyze relevant scholarly sources that serve as reference materials for the study. The second phase focuses on identifying key problem areas and developing the research instrument. This phase involves the formulation and refinement of questionnaire items, followed by an evaluation of the instrument's validity and a pilot study. The validity of the instrument is assessed by three subject matter experts to ensure its relevance and appropriateness before proceeding to the pilot study. The pilot study is conducted to evaluate the reliability of the instrument and identify areas for improvement, ensuring that it is well-suited for the actual data collection process. The third and final phase involves the data collection process, which is conducted in accordance with the prescribed research design. The collected data is then analyzed using appropriate statistical techniques. Findings are presented through graphical representations, tables, and test results, which facilitate the assessment of whether the proposed hypotheses are accepted or rejected.

3.2 Research Instrument

A questionnaire was utilized as the primary research instrument in this study due to its efficiency in collecting research data within a limited timeframe. The questionnaire was adapted and modified based on the studies of Mogren and Gericke (2019) and Amabile (1988), incorporating measurements related to the Teacher Creativity Contribution Level in ESD (C-ESD). The instrument was carefully compiled and distributed, ensuring that it encompassed all relevant aspects outlined in the conceptual framework. The questionnaire is structured into two sections: Part 1 focuses on the components of creativity among teachers, and Part 2 assesses teachers' pedagogical practices in Education for Sustainable Development (ESD). Respondents were required to evaluate each statement using a 5-point Likert scale, ranging

from 1 (Strongly Disagree) to 5 (Strongly Agree), allowing for a comprehensive assessment of their perspectives on creativity and pedagogical practices in ESD.

Table 1: Contents of the questionnaire instrument

Section	Item	Amount
Instrument of Teacher Creativity Contribution Level in ESD (C-ESD)	1. Components of creativity among Teachers	15
	2. Pedagogical practice of ESD among Teachers	15

Descriptive statistics were employed to analyze the data collected from Part (1) and Part (2) by calculating the mean, standard deviation, frequency, and percentage, which were subsequently presented in tables and graphs. The data from both sections—components of creativity and pedagogical practices of ESD among teachers—were analyzed using frequency distributions and percentage calculations to provide a comprehensive overview of the findings.

Furthermore, the responses obtained from the five-point Likert scale in Part (1) and Part (2) were analyzed to classify teachers' creativity levels and pedagogical practices in ESD into low, medium, or high categories. The mean was selected as the most accurate measure to represent the dataset, ensuring a reliable interpretation of the findings. The mean score interpretations are detailed in Table 2.

Table 2: Mean score interpretation

Interpretation Range	Mean Score
Low	1.00-2.33
Moderate	2.34-3.67
High	3.68 -5.00

Inferential statistics were utilized to examine comparisons, relationships, and effects among the study variables. Spearman's correlation was employed as the primary statistical method for inferential analysis to address the third research question, which investigates the potential relationship between teachers' creativity and their pedagogical practices in ESD. Spearman's correlation analysis was chosen for this dataset as it is particularly suitable for handling non-normally distributed data and mitigating the impact of large outliers, which might otherwise

obscure meaningful relationships between variables. This method ensures a more robust and reliable interpretation of the correlation between creativity and pedagogical practices in ESD.

Table 3: The interpretation of correlation coefficient value

Correlation coefficient value, r	Strength of linear relationship
≥ 0.8	Very strong
$0.5 < r < 0.8$	Moderately strong
$0.3 < r < 0.5$	Fair
< 0.3	Poor

4.0 ANALYSIS AND DISCUSSION

A total of 98 questionnaires were distributed by the researchers using the online method through Google Forms to respondents in one of the TVET institutions in Johor. The questionnaires are divided into two sections: Part (1) is on the components of creativity among teachers, and Part (2) is the pedagogical practice of ESD among teachers. Three components of creativity can be identified among teachers: domain skills, creative thinking skills, and motivation. the pedagogical practice of ESD is divided into holistic ideas, routine and structure and professional knowledge creation. The results of the analysis of the study are based on the objectives of the study and research questions focusing on the instrument of C-ESD.

Table 4 shows the results of the descriptive analysis of the study for each item in the domain skills elements. The results of the study showed that the item "I make the best use of my allotted time" (M = 4.57, SD = 0.56) obtained the highest mean value from other items, followed by the item "I provide activities appropriate to the topic of instruction" (M = 4.52, SD = 0.50). While the item that obtained a moderate mean value was the item "I have my method of controlling students in the classroom" (M = 4.38, SD = 0.60), followed by the item "I have a high understanding of teaching" (M = 4.37, SD = 0.58). The item with the lowest mean value is the item "I can give direction and motivate others to work for a common purpose" (M = 4.19, SD = 0.60).

Table 4: Descriptive analysis of items in domain skills

No.	Item	N	Mean	SD	Interpretation
1	I have a high understanding of teaching	98	4.37	0.58	Moderate high
2	I provide activities suitable to the topic of instruction	98	4.52	0.50	High
3	I make the best use of my allotted time	98	4.57	0.56	High
4	I can give direction and motivate others to work for a common purpose	98	4.19	0.60	Moderate high
5	I have my own method of controlling students in the classroom	98	4.38	0.60	Moderate high

Table 5 shows the results of the descriptive analysis of the study for each item in the elements of creative thinking skills respondents. The item "I create a tender and accepting environment in the classroom" (M = 4.50, SD = 0.65) obtained the highest mean value from the other items, followed by the item "I included an element of humour in the teaching" (M = 4.37, SD = 0.66). The item that obtained a moderate mean value was the item "I accept problems with an open mind" (M = 4.35, SD = 0.86), followed by the item "I highlight creative potential with the use of Information and Communication Technology" (M = 4.34, SD = 0.66). The item with the lowest mean value was "I encourage autonomy to the students themselves" (M = 4.08, SD = 0.70).

Table 5: Descriptive analysis of items in creative thinking skills

No.	Item	N	Mean	SD	Interpretation
1	I included an element of humor in the teaching	98	4.37	0.66	Moderate high
2	I highlight creative potential with the use of ICT	98	4.34	0.66	Moderate high
3	I create a tender and accepting environment in the classroom	98	4.50	0.65	High
4	I accept problems with an open mind	98	4.35	0.86	Moderate high
5	I encourage autonomy to the students themselves	98	4.08	0.70	Moderate high

Table 6 shows the results of the descriptive analysis of the study for each item in the motivation element of the respondents. The item "I want to know how well I can work in my workplace"

(M = 4.52, SD = 0.61) obtained the highest mean value from the other items, followed by the item "I am satisfied with the new experiences no matter what is the outcome" (M = 4.47, SD = 0.58). Then, the item that obtained a moderate mean value was the item "I am very motivated by the recognition of me from others" (M = 4.41, SD = 0.62), followed by the item "I am very motivated to teach with the salary been earn" (M = 4.38, SD = 0.73). The item with the lowest mean value is "I feel happy to overcome a completely new problem" (M = 4.22, SD = 0.65).

Table 6: Descriptive analysis of items in motivation

No.	Item	N	Mean	SD	Interpretation
1	I feel happy to overcome a completely new problem	98	4.22	0.65	Moderate high
2	I want to know how well I can work in my workplace	98	4.52	0.61	High
3	I am very motivated to teach with the salary been earn	98	4.38	0.73	Moderate high
4	I am very motivated by the recognition on me from others	98	4.41	0.62	Moderate high
5	I am satisfied with the new experiences no matter what is the outcome	98	4.47	0.58	Moderate high

Table 7 shows the descriptive analysis of the creativity component among teachers. In measuring each creativity component in the C-ESD, the mean value is used to determine each element of the question and respondent evaluation towards agreeing shows a mean value exceeding the value of 3.5. The analysis showed that the creativity for the skills domain component with a mean value (M = 4.41, SD = 0.45) is the highest of the other creativity components. This is followed by the motivation component (M = 4.40, SD = 0.45), while the creative thinking skills component showed the lowest creativity (M = 4.33, SD = 0.49).

Table 7: Descriptive analysis of creativity component among teachers (n=98)

Element	Mean	SD	Interpretation
Domain skills	4.41	0.45	Moderate high
Creative thinking skills	4.33	0.49	Moderate high
Motivation	4.40	0.45	Moderate high

Table 8 shows the results of the descriptive analysis of the study for each item in the holistic element of the respondents' ideas. The item "My school's holistic vision influenced my daily work as a teacher" obtained the highest mean value from the other items (M = 4.26, SD = 0.61), followed by the item "My school's holistic vision is usually used as a starting point when we plan our work" (M = 4.24, SD = 0.59). The item that obtained a moderate mean value was the item "My pedagogical practice is consistent with my school's holistic vision" (M = 4.21, SD = 0.58), followed by the item "My school's holistic vision is accepted as a basis for evaluating our work" (M = 4.18, SD = 0.60). The item with the lowest mean value was "I work all day systematically to apply the holistic pedagogical ideas of our school" (M = 4.16, SD = 0.57).

Table 8: Descriptive analysis of items in the holistic element of the idea

No.	Item	N	Mean	SD	Interpretation
1	My school's holistic vision influenced my daily work as a teacher	98	4.26	0.61	Moderate high
2	My school's holistic vision is accepted as a basis for evaluating our work.	98	4.18	0.60	Moderate high
3	My school's holistic vision is usually used as a starting point when we plan our work	98	4.24	0.59	Moderate high
4	My pedagogical practice is consistent with my school's holistic vision.	98	4.21	0.58	Moderate high
5	I work all day systematically to apply the holistic pedagogical ideas of our school	98	4.16	0.57	Moderate high

Table 9 shows the results of the descriptive analysis of the study for each item in the routine and structure of the respondents. The item "In our school, routines and structures are adapted as we increase our knowledge of how we can best contribute to student progress" obtained the highest mean value from the other items (M = 4.40, SD = 0.53) followed by the item "In our school, routines and structures are tailored to enhance our knowledge of how we can best contribute to student progress" (M = 4.22, SD = 0.51). The item that obtained a moderate mean value was "Our school routines and structures are designed to facilitate the implementation of our holistic vision" (M = 4.17, SD = 0.52). This was followed by the item "The existence of routines and structures facilitates the implementation of the idea of holistic school pedagogy" (M = 4.13, SD = 0.67). The item with the lowest mean value is "In our school, school leaders create organizational conditions that promote learning with staff based on pressing issues" (M

= 4.09, SD = 0.76).

Table 9: Descriptive analysis of items in routine and structure elements

No.	Item	N	Mean	SD	Interpretation
1	Our school routines and structures are designed to facilitate the implementation of our holistic vision	98	4.17	0.52	Moderate high
2	In our school, routines and structures are tailored to enhance our knowledge of how we can best contribute to student progress	98	4.22	0.51	Moderate high
3	In our school, school leaders create organizational conditions that promote learning with staff based on pressing issues	98	4.09	0.76	Moderate high
4	The existence of routines and structures facilitates the implementation of the idea of holistic school pedagogy	98	4.13	0.67	Moderate high
5	In our school, routines and structures are adapted as we increase our knowledge of how we can best contribute to student progress	98	4.40	0.53	Moderate high

Table 10 shows the results of the descriptive analysis of the study for each item in the professional knowledge creation element of the respondents. The item "I work in groups for long periods (term or school year) to learn more about any problem and others interested issue that occur" (M = 4.29, SD = 0.59) and "My school administration have promoted systematic effort in enhancing student development" (M = 4.29, SD = 0.59) obtained the highest mean value compared to other items. This is followed by the item that obtained a moderate mean value which is "I am focusing my teaching development efforts on more important areas" (M = 4.18, SD = 0.74) and "I am adoring discussion on other's ideas on how to contribute in student development in our school" (M = 4.15, SD = 0.58). The item with the lowest mean value was on "I will question students to know the feedback on my teaching and learning process" (M = 4.09, SD = 0.68).

Table 10: Descriptive analysis of items in professional knowledge creation

No.	Item	N	Mean	SD	Interpretation
1	I am focusing my teaching development efforts on more important areas	98	4.18	0.74	Moderate high
2	I work in groups for long periods (term or school year) to learn more about any problem and others interested issue that occur	98	4.29	0.59	Moderate high
3	I will question students to know the feedback on my teaching and learning process	98	4.09	0.68	Moderate high
4	I am adoring discussion on other's ideas on how to contribute in student development in our school	98	4.15	0.58	Moderate high
5	My school administration have promote systematic effort in enhancing student development	98	4.29	0.59	Moderate high

Table 11 shows the results of the descriptive analysis of ESD pedagogical practice among teachers. In measuring each ESD pedagogical practice for the instrument of C-ESD, the mean value is used to determine the assessment for each element of the questionnaire, and the respondent's view towards agreeing has shown a mean value exceeding 3.5. The results showed that the ESD pedagogical practice for the holistic ideas component (M = 4.21, SD = 0.48) is the highest of other ESD pedagogical practices. This is followed by the routine and structure component (M = 4.204, SD = 0.40), while the professional knowledge creation component (M = 4.200, SD = 0.4) showed the lowest ESD of pedagogical practice.

Table 11: Descriptive analysis of ESD pedagogical practice among teachers (n=98)

Element	Mean	SD	Interpretation
Holistic idea	4.21	0.48	Moderate high
Routine and structure	4.20	0.40	Moderate high
Professional knowledge creation	4.20	0.43	Moderate high

Table 12 shows the results of the analysis of the relationship of the creativity component to the pedagogical practice of ESD among those teachers in one of the TVET institutions in Johor. Spearman correlation analysis showed a significant relationship between the creativity component and the pedagogical practice of ESD with a value of r = 0.724 and sig = 0.000 (p

<0.05). The analysis shows a high positive correlation between creativity components and the pedagogical practice of ESD. Therefore, the study results prove that the relationship between creativity components influences the pedagogical practice of ESD among teachers in this TVET institution. From the Spearman correlation analysis conducted on this research question, the researcher can conclude that the research hypothesis, Ha is accepted, and the research hypothesis, Ho is rejected.

Table 12: The relationship between creativity components to the pedagogical practice of ESD among teachers

Relationship		Educational Sustainable Development	Interpretation
Creativity	r	0.724	High
	Sig. (2-tailed)	0.000	
	N	98	

The first research question in this study was to identify the level of creativity component among teachers in this TVET institution, which consists of domain skills, creative thinking skills and motivation. The results indicated that the creativity component in the skills component is at the highest level. Such influence will have implications for the formation of human capital aspired by the state. According to Fujii (2021), domain-related skills include knowledge of facts, technical skills and unique talents in a particular domain or into the domain being ventured. In addition, according to Depaepe, Verschaffel, and Star (2020), the domains of teacher competence, namely knowledge, skills, attitudes and personalities of teachers, are seen to have a significant influence on creative teaching practices. Such influence will have implications for the formation of human capital aspired by the state. Besides, Sarabani (2021) states that teachers' creativity level influences teachers' effectiveness in learning by teachers in imparting knowledge in the classroom. To attract students to learn the subjects studied, using multimedia as the latest technique in teaching and learning is essential. Therefore, teaching and learning today require innovation and creativity to help raise student achievement (Fitria & Suminah, 2020).

The second research question in this study is to identify ESD pedagogical practices among teachers in this TVET institution, which consists of pedagogical practices in holistic ideas, routines and structures and professional knowledge creation. Respondents have shown a high level of ESD on pedagogical practice for Routine and structure, holistic ideas and

professional knowledge creation. According to Tristananda (2018), ESD is a broad teaching and learning process that encourages an interdisciplinary and holistic approach that promotes critical and creative thinking in the educational process. By adopting and integrating these elements holistically, ESD enables all individuals to acquire the knowledge, perspectives, values and skills needed to make relevant decisions to improve the quality of life now but still prioritize the needs of future generations (Nousheen et al., 2020) Therefore, training and workshops, especially in TVET institution, need to be proposed to enhance the professional development of prospective teachers. Besides, further research is also needed to increase the value and intention to integrate ESD as the practice of ESD processes has enabled the creation of intelligent, sustainable, resource-efficient, personalised and adaptive learning environments (Cebrian, Palau, & Mogas, 2020).

The third research question was to identify the relationship between the creativity components and ESD pedagogical practice among teachers in this TVET institution. The findings state that the relationship between creativity and ESD is high, which indicates that the creativity component can better influence ESD's pedagogical practice among teachers in this TVET institution. Restrepo et al. (2017) have shown the importance of linking theory and practice during critical reflection. This enables us to understand the relationships between ESD competency characteristics and categories of pedagogical styles in professional development.

Therefore, the ESD vision links to reviving the system by placing their inspiration in the TVET curriculum through creativity that focuses on sustaining TVET programs. This shows that creativity and ESD can provide good benefits to TVET, which is in line with the purpose of the study, which shows creativity has a significant relationship to ESD. Jauhariyah et al. (2021), state that to optimally implement the level of creative problem-solving, it is necessary to have a role as a lecturer who facilitates the creation of physics education in building a physics curriculum based on ESD. Likewise, for learning activities to direct and foster self-organised learning, observing lecturer behaviour needs to foster physics education creativity in a creative problem-solving environment (Jauhariyah et al., 2019). Moreover, according to Andresen, Høgmo, and Sandås (2015), Norway, like other European countries, supports and agrees to implement ESD as outlined in the UNESCO Decade on ESD (2005-2014) (DESD) as ESD enables every human being to acquire the knowledge, skills, attitudes and values needed to shape a sustainable future.

5.0 CONCLUSION

In conclusion, this study has been conducted to identify the relationship between creativity components consisting of domain skills, creative thinking skills and motivation on the pedagogical practice of ESD consisting of holistic ideas, routine & structure and professional knowledge creation among teachers in one of the TVET institutions at Johor. The study conducted by the researcher has answered all the research questions that have been identified as the researcher hopes that this study can contribute to the stakeholders in implementing and assisting TVET teachers in Malaysia in terms of creativity and innovation in TVET as the creativity component can influence the pedagogical practice of ESD among teachers have been proven. ESD is generally a process that develops students' concerns, abilities, attitudes, and values.

ESD must be integrated into learning activities to instil awareness and concern for the environment for sustainable development. Creativity is one of the students' potentials that the country's educational goals must develop. Students' creativity can be developed through learning activities that can improve students' creative thinking skills, such as the Project-Based Learning model. Creative thinking can be formulated as the ability to think based on available data or information and find many possible answers operationally; creativity can be formulated as the ability to think or give ideas smoothly, flexibly, and originally elaborate ideas. Therefore, further and continuous research must be implemented to provide benefits and contributions to researchers who want to research the components of creativity and pedagogical practice in ESD involving TVET teachers.

ACKNOWLEDGEMENT

REFERENCES

Ab Halim, F., Muda, W. H. N. W., Zakaria, N., & Samad, N. H. B. A. (2020). The potential of using Augmented Reality (AR) technology as learning material in TVET. *Journal of Technical Education and Training, 12*(1), 119-124.

Ahmad, A. R., Segaran, Soon, N. K., Sapry, H. R. M., & Omar, S. S. (2019). Factors influence the students' readiness on industrial revolution 4.0. *International Journal of Recent Technology and Engineering, 8*(2), 461–468.

Albareda-Tiana, S., Vidal-Raméntol, S., & Fernández-Morilla, M. (2018). Implementing the sustainable development goals at university level. *International Journal of Sustainability in Higher Education, 19*(3), 473-497.

Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behavior, 10*(1), 123-167.

Andresen, M. U., Høgmo, N., & Sandås, A. (2015). Learning from ESD projects during the UN decade in Norway. In *Schooling for sustainable development in Europe* (pp. 241-255). Springer.

Azizan, N., Pangil, F., & Zin, M. L. M. (2021). Human capital development in Malaysia: Issues and challenges. In B.S. Sergi, & A.R. Jaaffar (Eds.), *Modeling economic growth in contemporary Malaysia (Entrepreneurship and global economic growth)* (pp. 151-175). Emerald Publishing Limited, Bingley.

Bistaman, I. N. M., Idrus, S. Z. S., & Abd Rashid, S. (2018). The use of augmented reality technology for primary school education in Perlis, Malaysia. In *Journal of Physics: Conference Series*. IOP Publishing.

Cebrian, G., Palau, R., & Mogas, J. (2020). The smart classroom as a means to the development of ESD methodologies. *Sustainability*, *12*(7), 1-18.

Chinedu, C. C., Wan-Mohamed, W. A., & Ogbonnia, A. A. (2018). A systematic review on education for sustainable development: Enhancing TVE teacher training programme. *Journal of Technical Education and Training, 10*(1), 109-125.

Cramond, B. L., & Fairweather, E. C. (2013). Future problem solving as education for innovation. In L.V. Shavinina (Ed.), *The Routledge international handbook of innovation education* (pp. 215-226). Routledge.

Curtis, E. A., Comiskey, C., & Dempsey, O. (2016). Importance and use of correlational research. *Nurse Researcher, 23*(6), 20-25.

Depaepe, F., Verschaffel, L., & Star, J. (2020). Expertise in developing students' expertise in mathematics: Bridging teachers' professional knowledge and instructional quality. *ZDM-Mathematics Education, 52*(2), 179-192.

Douse, M., & Uys, P. (2019). TVET teaching in the time of digitization. In S. McGrath, M. Mulder, J. Papier, & R. Suart (Eds.), *Handbook of vocational education and training* (pp. 23-38). Springer.

Ellappan, M. R., Mahat, H., & Nayan, N. (2018). Implementation of sustainable development education in the context of administrator attitudes in the Malaysian institute of teacher education. *GEOGRAFI, 6*(1), 50-60.

Fitria, H., & Suminah, S. (2020). Role of teachers in digital instructional era. *Journal of Social Work and Science Education, 1*(1), 70-77.

Fujii, H. (2021). Towards the identification of ESD competencies required for pre-service science teachers. In *Science education research and practice from Japan* (pp. 155-171). Springer.

Ilovan, O. R., Dulama, M. E., Xenia, H. N. K., Botan, C. N., Horvath, C., Nitoaia, A. & Rus, G. M. (2019). Environmental education and education for sustainable development in Romania. *Romanian Review of Geographical Education, 8*(2), 21-37.

Jasmi, N., & Kamis, A. (2019). Importance of green technology, education for sustainable development (ESD) and environmental education for students and society. *Journal of Engineering Research and Application, 9*(2), 56-59.

Jauhariyah, M. N. R., Hariyono, E., Abidin, E. N., & Prahani, B. K. (2019). Fostering prospective physics teachers' creativity in analysing education for sustainable development based curricula. In *Journal of Physics: Conference Series*. IOP Publishing.

Jauhariyah, M. N. R., Prahani, B. K., Syahidi, K., Deta, U. A., Lestari, N. A., & Hariyono, E. (2021). ESD for physics: How to infuse education for sustainable development (ESD) to the physics curricula. In *Journal of Physics: Conference Series*. IOP Publishing.

Jessurun, H., Anthonio, G., & Weggeman, M. (2020). *Building bridges: On the overlap between the component model of creativity and the model of high giftedness*. SAGE Publishing.

Kandangama, K. G. C. (2018). Challenges and barriers for implementing Education for Sustainable Development (ESD) in secondary schools in Sri Lanka. *In Proceedings of the International Conference on Future of Education, 1*(1), 1-7.

Leicht, A., Heiss, J., & Byun, W. J. (2018). *Issues and trends in education for sustainable development* (Vol. 5). UNESCO Publishing.

Madar, A. R., Chew, E. S., & Hamid, H. (2019). Facilitating torrance tests of creative thinking use in Malaysian TVET research: The initial step of inter-rater reliability determination. *Journal of Technical Education and Training, 11*(1), 100-108.

Mahat, H., & Idrus, S. (2017). Education for sustainable development in Malaysia: A study of teacher and student awareness. *Geografia-Malaysian Journal of Society and Space*, *12*(6), 77-88.

Mahat, H., Hashim, M., Saleh, Y., Che Ngah, M. S. Y., & Nayan, N. (2016). Critical aspects of sustainable development education based on teacher interview data. *(Aspek kritikal*

pendidikan pembangunan lestari berdasarkan data temu bual guru). Journal of Social Science, 2(1), 52-66.

Martin, S. N., Suryadi, D., & Juandi, D. (2019). Students' difficulties in solving the mathematics word problems with the context of Education for Sustainable Development (ESD). In *Journal of Physics: Conference Series*. IOP Publishing.

Mathie, R. G. (2019). *Education for sustainable development in Norway: Calling for a whole institution approach.* (Unpublished master thesis). Norwegian University of Life Sciences.

Mogren, A., & Gericke, N. (2019). School leaders' experiences of implementing education for sustainable development—Anchoring the transformative perspective. *Sustainability, 11*(12), 33-43.

Mohammad, M., & Othman, N. (2018). The level of tendency in entrepreneurial career choice of vocational college students. *International Journal of Education, Psychology and Counseling, 3*(21), 18–30.

Mokshein, S. E. (2019). Education for Sustainable Development (ESD) in Malaysia: Policy, program and evaluation. In *3rd International Conference on Current Issues in Education (ICCIE 2018)* (pp. 6-12). Atlantis Press.

Nousheen, A., Zai, S. A. Y., Waseem, M., & Khan, S. A. (2020). Education for sustainable development (ESD): Effects of sustainability education on pre-service teachers' attitude towards sustainable development (SD). *Journal of Cleaner Production, 250*(1), 119537.

Pavlova, M., & Chen, C. S. (2019). Facilitating the development of students' generic green skills in TVET: An ESD pedagogical model. *TVET@ Asia, 12*(1), 1-21.

Qian, C., Yu, K., & Gao, J. (2021). Understanding environmental attitude and willingness to pay with an objective measure of attitude strength. *Environment and Behavior, 53*(2), 119-150.

Rekan, A. A., Kasim, T. S. A. T., & Yusoff, Y. M. (2019). The role of the Islamic education context in driving sustainable development education in Malaysia. *Albasirah Journal, 7*(1), 1-12.

Restrepo, M. M. C., Blanco-Portela, N., Ladino-Ospina, Y., Sigua, R. N. T., & Vargas, K. O. (2017). Professional development of university educators in ESD: A study from pedagogical styles. *International Journal of Sustainability in Higher Education, 18*(5), 648-665.

Rieckmann, M. (2018). Learning to transform the world: Key competencies in education for sustainable development. *Issues and Trends in Education for Sustainable Development, 39*(1), 39-59.

Roofe, C., & Ferguson, T. (2018). Technical and vocational education and training curricula at the lower secondary level in Jamaica: A preliminary exploration of education for sustainable development content. *Discourse and Communication for Sustainable Education, 9*(2), 93-110.

Samsudin, M. Z., Hassan, R., & Hasan, A. (2014). *Sustaining TVET programs based on teacher creativity.* Persidangan Pendidikan (Penyelidikan dan Inovasi) dalam Pendidikan dan Latihan Teknikal dan Vokasional.

Sarabani, S. B. (2021). Students level of use and understanding in the combined use of multimedia teaching aids package in the teaching and learning of history. *Malaysian Journal of Social Sciences and Humanities, 6*(3), 252-258.

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach.* John Wiley & Sons.

Short, M. N., & Keller-Bell, Y. (2021). Essential skills for the 21st century workforce. In *Research anthology on developing critical thinking skills in students* (pp. 97-110). IGI Global.

Smith, D. W. (2020). Descriptive psychology and phenomenology: From Brentano to Husserl to the logic of consciousness. In *Franz Brentano and Austrian philosophy* (pp. 49-71). Springer.

So, K., & Hu, Y. (2019). Understanding creativity in an Asian school context: Korean teachers' perspectives. *Thinking Skills and Creativity, 33*(1), 100573.

Stehman, S. V., & Overton, W. S. (2020). Spatial sampling. In *Practical handbook of spatial statistics* (pp. 31-63). CRC Press.

Tristananda, P. W. (2018). Grounding Education for Sustainable Development (Esd) in Indonesia in facing global issues. *Purwadita: Jurnal Agama dan Budaya, 2*(2), 42-49.

UNESCO. (2017). *Education for sustainable development goals: Learning objectives.* UNESCO.

Wanjala, G., & Osendo, L. P. (2019). Appraissing teacher creativity and collaborative skills in public primary schools in Mumias East Sub-County, Kenya. *International Journal of Education and Research, 7*(6), 207-217.

Wolff, L., Sjöblom, P., Hofman-Bergholm, M., & Palmberg, I. (2017). High performance education fails in sustainability? – A Reflection on Finnish Primary Teacher Education. *Education Sciences, 7*(1), 1-22.

Zguir, M. F., Dubis, S., & Koç, M. (2021). Embedding Education for Sustainable Development (ESD) and SDGs values in curriculum: A comparative review on Qatar, Singapore and New Zealand. *Journal of Cleaner Production, 319*(1), 1-22.