The influence of class climate, school culture and literacy on green skills vocational culinary practice

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Abstract: Skills in material management and procedures are important to reduce food waste in the culinary field. SMK Tata Boga is required to form graduates who have green skills. However, initial observations show that the application of green skills in vocational schools is not optimal. This study aims to determine how the application of green skills in vocational culinary learning practices, as well as the influence of classroom climate, school culture, and literacy on it. The study involved 170 students, with data collected through questionnaires and observation sheets. However, the t-test shows that classroom climate does not affect the application of green skills in vocational culinary practice learning with a p-value of 0.239 and t-value of 1.182, school culture affects the application of green skills in vocational culinary practice learning with a p-value of 0.023 and t-value of -2.292, and information literacy does not affect the application of green skills in vocational culinary practice learning with a p-value of 0.612 and t-value of 0.508. The F test with a p-value of 0.128 shows that simultaneously, classroom climate, school culture, and literacy have no effect on the application of green skills in vocational culinary practice learning. For future research, other factors should be added that can increase the application of students' green skills in learning culinary practices. The application of students' green skills also needs to be seen from habituation which is not limited to activities in schools but also families and community environments.

Keywords: Culinary school, green skill, vocational

Abstrak: Keterampilan dalam pengelolaan bahan dan prosedur penting untuk mengurangi sampah makanan di bidang kuliner. SMK Tata Boga dituntut membentuk lulusan yang memiliki green skill. Namun, observasi awal menunjukkan penerapan green skill di SMK belum optimal. Penelitian ini bertujuan mengetahui bagaimana penerapan green skill dalam praktik pembelajaran Tata Boga, serta pengaruh iklim kelas, budaya sekolah, dan literasi terhadapnya. Penelitian melibatkan 170 siswa, dengan data dikumpulkan melalui angket dan lembar observasi. Hasil menunjukkan bahwa penerapan green skill, iklim kelas, budaya sekolah, dan literasi berada pada kategori baik. Namun, uji t menunjukkan iklim kelas tidak berpengaruh terhadap penerapan green skill pada pembelajaran praktik tata boga di SMK dengan p-*value* sebesar 0,239 dan t-*value* 1,182, budaya sekolah berpengaruh terhadap penerapan green skill pada pembelajaran praktik tata boga di SMK dengan p-*value* sebesar 0,023 dan t-*value* -2,292, dan literasi informasi tidak berpengaruh terhadap penerapan green skill pada pembelajaran praktik tata boga di SMK dengan p-*value* sebesar 0,612 dan t-*value* 0,508. Uji F dengan p-*value* sebesar 0,128 menunjukkan bahwa secara simultan, iklim kelas, budaya sekolah, dan literasi tidak berpengaruh signifikan terhadap penerapan green skill pada pembelajaran praktik Tata Boga di SMK. Bagi penelitian yang akan datang, sebaiknya ditambahkan faktor-faktor lain yang dapat meningkatkan penerapan green skill siswa pada pembelajaran praktik tata boga. Penerapan green skill siswa juga perlu dilihat dari pembiasaan yang tidak terbatas pada kegiatan yang ada di sekolah tapi juga keluarga dan lingkungan masyarakat.

Kata kunci: Tata boga, green skill, SMK

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INTRODUCTION

The involvement of all sectors in environmental issues is a global concern, including the role of education in creating sustainable solutions. Schools, especially vocational

schools, ideal as a place to form prospective workers, have a strategic role in instilling environmental awareness through the integration of green skills in the learning process, especially in skill practices such as culinary which has an impact on the culinary industry. Green skills refer to knowledge, attitudes and technical abilities to support a sustainable living environment (Hamid et al., 2019; Ibrahim et al., 2020; Kamis et al., 2019; Mahapatra & Ravichandran, 2023; Pirzada et al., 2023). The application of green skills in Culinary practices is increasingly important because the culinary industry produces large amounts of waste, high energy consumption, and contributes to climate change. The composition of food waste is 46.5%, the largest of the total waste composition (DPUPKP Kab. Sleman, 2024). This can be anticipated by managing pre-consumer waste, starting from the process of material procurement, preparation, and maintenance (Ko & Lu, 2021; Siaputra et al., 2019). Minimizing food waste requires culinary skills and knowledge (Lu & Ko, 2023), which can be facilitated by vocational education institutions.

The application of green skills that can be carried out by culinary vocational students includes familiarizing the 5R method work attitude, namely concise, neat, clean, maintain and diligent. Habituation of work attitudes based on concise, neat, clean, care, diligence can increase sustainable work efficiency (Panjaitan et al., 2024). Green action skills also refer to 3R actions (reduce, reuse, recyle), minimizing the use of electricity and water (Kamis et al., 2018; Law et al., 2023) and waste reduction (Wang, 2016). Meanwhile, according to Ko & Lu (2021), the ability in cooking management to reduce wasted waste includes menu analysis, planning and cooking management. By applying the 3R principles to the cooking management process, everyone can actively and efficiently reduce the volume of waste generated, reuse materials and products, and recycle by separating waste with reusable elements (Law et al., 2023). This will support the learning outcomes of culinary major in SMK which include K3, preparation of tools and ingredients, making dishes and serving dishes whose processes support environmentally friendly efforts.

A classroom climate in practical learning that supports student engagement to support green efforts results from student and teacher interactions in a classroom setting through physical structures, work routines and rules (Barksdale et al., 2021; Ramírez Hernández et al., 2024). It can increase the effectiveness of the educational process, in this context it can encourage student engagement in environment-based learning (Tłuściak-Deliowska, 2022). Achievement in student learning is influenced by how the classroom climate works. Interactions within the classroom climate according to a study at an agricultural vocational school, showed that teachers' knowledge of green skills was still lacking so that students' green skills were also low (Handayani et al., 2020).

School culture that promotes sustainability values is also an important foundation in shaping students' attitudes and behaviors towards environmental issues. School support, pleasant emotions, motivation, norms, authoritative space, concrete actions, and media encourage students to act responsibly towards the environment (Huoponen, 2024). The implementation of school culture to build an attitude of environmental care is carried out by habituation activities (Harsari et al., 2020; Silahooy et al., 2024). This habituation can be done by routine student activities, exemplary school environment, spontaneous activities, and environmental care conditioning. School culture raises environmental awareness by awareness of throwing garbage in its place, maintaining the cleanliness of the classroom and school environment, carrying out picket activities, water-saving behavior of students.

On the other hand, green skill information literacy, which is the ability of students to access, understand, and apply information related to green skills, is a crucial aspect in ensuring that environmental knowledge can be implemented in practice. Green skill literacy refers to green literacy as the process of processing information that has an impact on a sustainable environment (Hauke, 2022). It is also necessary in dealing with misinformation and fake news to eliminate society's confirmation bias (Kennedy et al., 2022). Some studies show that students still have limitations in environmental literacy which causes the understanding of green practices to be limited (Hanafi et al., 2023; Kurt Gökçeli & Özer, 2022; Uyun & Suhartini, 2024; Waqidah et al., 2020). In other studies, it shows that the level of literacy of vocational students related to the environment is still lacking and low (Jarwopuspito et al., 2023). In fact, environmental literacy can increase student awareness and involvement (Jannah et al., 2024).

Eempirical studies that examine the relationship between classroom climate, school culture, and green skills information literacy on the implementation of green skills in the context of vocational culinary practice are still limited. Therefore, this research is relevant to answer the need for a more comprehensive understanding of the factors that influence the implementation of green skills in vocational learning, especially in the culinary major. Through this research, it is hoped that a clear picture can be obtained regarding the extent to which classroom climate, school culture, and green skills information literacy contribute to the implementation of green skills in vocational culinary practice learning. These findings can later become the basis for developing learning strategies that are more oriented towards sustainable education in vocational education.

METHOD

This research approach uses quantitative with survey method with data collection activities using questionnaires. The population characteristics in this study are culinary art vocational students in grade XI at SMKs that have an environmentally sound school vision and mission. Determination of the sample using proportional random sampling technique so as to obtain a total sample of 170 samples.

This study used questionnaires and observation sheets to collect data. The questionnaire used is closed with 4 alternative answers using a Likert scale. Score 4 = strongly agree, score 3 = agree, score 2 = disagree and score 1 = strongly disagree. While the observation sheet is used for a more objective assessment in assessing a phenomenon (Kristanto, 2018), with 2 alternative answers "performed" and "not performed" with a guttman scale. If students take action in accordance with the statement item, they get a score of 1 and if students do not take action in accordance with the statement item, they are given a score of 0. The instrument grid is presented in Table 1.

Before the questionnaire was distributed and the observation sheet was checked, the instrument was first tested for validity, reliability and item difficulty. The validity test was carried out through the instrument validity test involving expert culinary lecturers. Through expert consideration, the concepts raised in the research are right on target, so that the instruments of each variable can be declared valid to represent all material. Instruments that have been consulted by experts are then tested for construct validity. Construct validity is tested empirically in the field. Empirical construct validity testing was carried out on 36 respondents. Construct validity uses the Pearson Product Moment

correlation formula. The statement items of the instrument are valid if the value of r value ≥ r table 0.3202 at the 5% significance level. Then, the reliability test uses the Cronbach's Alpha method. The instrument is considered reliable if the Cronbach Alpha value ≥ 0.60 (Imaduddin et al., 2022; Raharjanti et al., 2022). Indicators of the application of green skills in the knowledge domain, in the form of test questions, need to be tested for the difficulty of test items. The results of the test item difficulty test showed an easy level of difficulty. Tests for diagnostic purposes can use easy difficulty levels.

Table 1. Instrument grid

Variable	Indicator	Techniques
Green Skill in Vocational Culinary Practice	Knowledge (C1, C2, C3)	Test
	Attitude	Questionnaire
	Action (3R, 5R, waste management)	Observation
Class Climate	Interaction between students	
	Student interaction with teachers	Questionnaire
	Class organization	
	Class room facilities	
School Culture	Value	
	Habits	Questionnaire
	Symbol	
Information Literacy	Accessing green skill information	
	Evaluating green skill information	Questionnaire
	Using green skill information	

Once data collection is complete, the different types of scales on the raw data need to be standardized. This research instrument has different measurement scales, especially on the green skill application variable, which has a guttman scale of 0 and 1 for knowledge and action indicators and a Likert scale of 4 for attitude indicators. Thus, score standardization is needed so that the weight is the same for each variable. The score standard is determined by weighting 100% on each raw score. Then, to determine the tendency of each variable with the classification of very bad, bad, enough and good, the score criteria are calculated using the ideal mean and ideal standard deviation used for the categorization score range. The categorization scale is as follows:
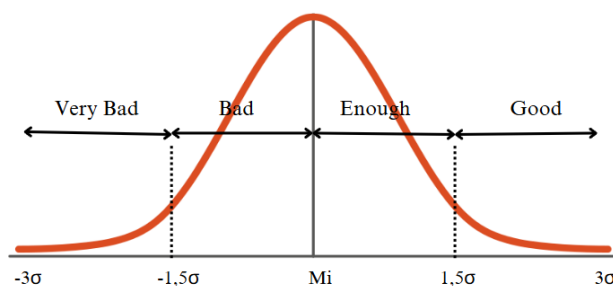

Fig.1. Categorization scale range

Data analysis using multiple linear regression, classical assumption prerequisites must be met. Normality test using Kolmogorov Smirnov test through unstandardized

residual significance value 0.200> 0.05. While the VIF value of the Multicollinearity test of the classroom climate variable is 1.846 ≤ 10, the school culture variable is 1.732 ≤ 10 and information literacy is 2.168 ≤ 10.

RESULTS AND DISCUSSION

Implementation of green skills in vocational culinary practice learning
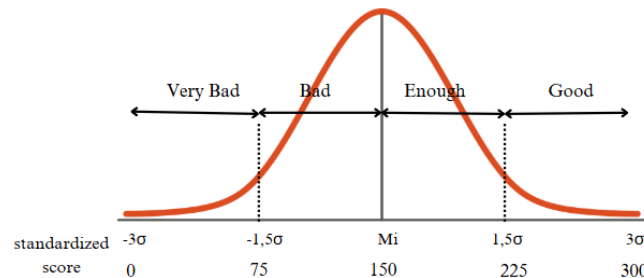

Fig.1. Categorization scale range implementation of green skills

The implementation of green skills in learning culinary practices is seen from the knowledge, attitudes and actions of students carrying out work practice activities in the K3 process, preparation, processing of cooking ingredients and serving dishes paying attention to garbage, waste and energy management. The application of green skills in learning culinary practices in vocational schools is carried out properly or not, known from descriptive analysis. Based on the mean value of 247.5, it can be seen that the application of green skills in learning culinary practices in vocational schools seen from the aspects of knowledge, attitudes and actions of students from 170 samples generally has a tendency to be in the good category. While the trends based on knowledge, attitude and action are partially described in the frequency table below:

Table 2. Frequency tendency of green skill knowledge

Categories	Frequency	Percentage
Very Bad	0	0%
Bad	0	0%
Enough	20	12%
Good	150	88%
	170	100%

88% of the majority of students or as many as 150 students have a good tendency of green skill knowledge.

Table 3. Frequency tendency of green skill attitude

Categories	Frequency	Percentage
Very Bad	0	0%
Bad	0	0%
Enough	32	19%
Good	138	81%
	170	100%

81% of the majority of students or 138 students have a tendency to have a good green skill attitude.

Table 4. Frequency tendency of green skill action

Categories	Frequency	Percentage
Very Bad	0	0%
Bad	16	9%
Enough	66	39%
Good	88	52%
	170	100%

52% of the majority of students or as many as 88 students have a tendency for good green skill actions.

Student knowledge has a good tendency of 88%, while student attitudes towards the application of green skills have a good tendency of 81% and student green skill actions have a good tendency of 52%. The percentage of good tendencies that are decreasing from knowledge, attitudes and actions is in line with research in line with research related to health protocol behavior has a distribution of 90.3% good knowledge categories, 55.8% good attitudes and 46% good actions (Suryanegara et al., 2024). The application of green skills in learning culinary practices is seen from the knowledge, attitudes and actions of students carrying out work practice activities in the K3 process, preparation, processing of cooking ingredients and serving dishes paying attention to waste, waste and energy management. The formation of work attitudes becomes one of the main objectives of education. Work attitudes related to supporting a sustainable living environment are formulated in the practice of the 5R method, namely concise, neat, clean, maintain and diligent, which is an adaptation of 5S Seiri, Seiton, Seiso, Seiketsu, and Shitsuke. Habituation of work attitudes based on concise, neat, clean, maintain and diligent can improve sustainable work efficiency (Panjaitan et al., 2024; Pramono et al., 2023; Ridwan et al., 2025; Saputra et al., 2024). In the study, it was concluded that although the majority of respondents had good knowledge and attitudes, this did not always shape the practice of work attitudes, because realizing practice also depends on internal and external factors such as social and cultural factors and the availability of facilities and infrastructure.

The application of green skills in culinary practice learning in vocational schools refers to the theory of behavior according to 3 domains of behavior, namely knowledge (cognitive domain), skills/actions (psychomotor) and attitudes and values (affective). Green skill behavioral skills in culinary education are shown through work attitudes, material waste management (Karachalios & Kotsios, 2023), minimizing energy use (Law et al., 2023), and waste reduction (Manansala & Marty, 2020). Students' knowledge, attitudes and actions are classified as good, indicating that learning achievements related to K3, preparation of tools and ingredients, making and serving dishes are done well. The application of students' green skills has a good tendency, indicating that students basically understand the concept of green skills well in theoretical learning outcomes and concepts related to K3, preparation of tools and ingredients, making and serving dishes. However, even though students' knowledge is good, not every student has the awareness to do green

skills positively. The tendency of students' green skill actions shows the most difficult stage of behavior for students to do. The percentage of actions that are far adrift shows a gap in understanding and attitude to the real action of K3 practices, preparation of tools and ingredients, making to serving dishes to protect the environment.

The influence of classroom climate on green skills vocational culinary practice

The significance of classroom climate on the application of green skills in vocational culinary practice learning is 0.239 > 0.05 and t-value 1.182 < t-table 1.9744 (Table 5), indicating that classroom climate does not have a significant influence on the application of green skills in vocational culinary practice learning.

Table 5. T-test result classroom climate on green skills vocational culinary practice

	Coefisien Regresi	**Coefisien BetaX**	**t-value**	**Significance**
Class Climate	0.313	0.122	1.182	0.239

Good classroom climate conditions in carrying out green skill practices during learning through the role of teachers and peer involvement can motivate to improve students' academic, socio-emotional and behavioral competencies so that learning outcomes seen from students' knowledge, attitudes and actions can be achieved properly. The classroom climate in encouraging students' green behavior requires students' awareness and persistence to do so (Lestiani et al., 2021). Although students' knowledge, attitudes and actions are on a good trend, the percentage of the trend is decreasing from knowledge to attitude and attitude to action. This shows that students' awareness that leads to action is decreasing compared to awareness of their knowledge and attitudes. This finding is supported by research which states that education in the classroom does not always change student behavior, but long-term habituation of action is needed (Serebrennikov et al., 2020). Classroom climate provides opportunities to develop children's academic, socio-emotional and behavioral competencies (Wang et al., 2020).

In student learning, involving theoretical and practical lessons, knowledge about the application of green skills if only conveyed through theoretical lessons without direct involvement during practice, it can be a factor that affects student knowledge. In Wang et al. (2020), the classroom climate has an effect on student attitudes, indicating that the perception and persistence of the environment formed by the classroom climate, gives students awareness to take an attitude according to the formed environment. However, lack of student involvement, lack of teacher direction or lack of enforcement to carry out green skill activities, can reduce students' drive to act. Another dimension of classroom climate that affects students' disciplinary behavior is the completeness and condition of physical facilities. The difference in physical facilities in the practice room in each class seems to be the absence of trash bins according to their type, waste disposal sites, exhausting fans, and other physical completeness makes students not optimal to carry out green skill activities during practical learning.

The influence of school culture on green skills vocational culinary practice

The significance of school culture on the application of green skills in learning culinary practices at vocational schools is 0.023 < 0.05 and t- value -2.292 < t-table 1.9744 (Table 6), indicating that school culture has a significant negative effect on the application of green skills in vocational culinary practice learning.

Table 6. T-test result school culture on green skills vocational culinary practice

	Coefisien Regresi	Coefisien BetaX	t-value	Significance
School Culture	-0.603	-0.230	-2.292	0.023

The green school culture activity program at school is not enough to improve students' green behavior in daily life, a better application of habituation is needed (Amrullah & Herdiansyah, 2019). Better habituation of green behavior, not limited to the school environment, also needs to be done in the family and community environment (Osman et al., 2024). The negative influence of school culture on students' green skill knowledge can be caused by a lack of emphasis on the importance of environmental practices. The lack of promotion of green skill values through appeals during ceremonies or appeal posters can cause students to be insufficiently informed about the importance of green skill concepts. School culture has a significant negative effect on students' green skill actions when learning culinary practices, which can be caused by a lack of real examples at school, lack of habituation or lack of facilities. Students' knowledge and attitudes, which tend to be high in the application of green skills, in its implementation cannot always be carried out into real action due to the lack of complete architectural facilities.

The influence of literacy on green skills vocational culinary practice

The significance of green skill information literacy on the application of green skills in vocational culinary practice learning is 0.612 > 0.05 and t-value 0.508 < t-table 1.9744 (Table 7), indicating that green skill information literacy does not have a significant influence on the application of green skills in vocational culinary practice learning.

Table 7. t-Test result literacy on green skills vocational culinary practice

	Coefisien Regresi	Coefisien BetaX	t-value	Significance
Information Literacy	0.141	0.057	0.508	0.612

Acquiring information literacy involves selecting quality and credible sources to avoid invalid information (Zaenudin & Suwatno, 2019). This result can occur because the sources used as references are not credible and are not specific to green skill information that can be applied during culinary practice. This finding is supported by research that generally high levels of environmental literacy and green consumption, but relatively lower performance in dimensions such as environmental behavior skills, environmentally friendly products, and material recycling (Liu & Tobias, 2024). A high level of environmental literacy does not solely guarantee pro-environmental behavior, as this study shows that climate change awareness mediates pro-environmental behavior (Pilare & Acledan, 2024). Green literacy is needed to build critical thinking skills (Bada et al., 2024). The application of green

skills requires not only knowledge but also critical thinking to apply these skills in a practical environmentally friendly manner that is more effective. Students may have good knowledge literacy, but not yet critical to apply it practically. This can be seen from the actions of students 9% of students have poor green skill actions, and 39% of students have sufficient green skill actions and only 52% of students have good green skill actions.

Simultaneous influence of classroom climate, school culture and literacy on green skills vocational culinary practice

The significance of the simultaneous independent variables of classroom climate, school culture and literacy on the application of green skills in vocational culinary practice learning is $0.128 > 0.05$ and F-value $1.922 <$ F-table 2.42 (Table 8), indicates that the independent variables of classroom climate, school culture and green skill information literacy does not have a simultaneous influence on the application of green skills in vocational culinary practice learning.

Table 8. F-test result

F-value	Significance	R	R Square
1.922	0.128	0.183	0.034

Although the combined influence of literacy, classroom climate, and school culture on student behavior is evident, it is important to consider that individual student factors and external influences can also significantly affect green skill implementation behavior, suggesting a more complex interaction than identified in this study. Students' green behaviors are formed through various factors, including institutional support, family influence, and social dynamics (Osman et al., 2024). Thus, the simultaneous effect of green skill implementation on learning culinary practices in vocational schools may be influenced by gaps in factors outside the learning environment such as family influence and social dynamics that have not been measured in this study. In addition, in Osman et al. (2024), environmental awareness intervention is needed so that students' green behavior can be formed.

High student knowledge may indicate that students may gain green skill knowledge outside the learning environment such as from family or community. Students' attitudes are formed from factors such as interactions that occur in the classroom, the school culture upheld and information obtained collectively. The values shown through these interactions form students' awareness of the importance of applying green skills to strive for sustainable food processing. Although in green skill actions, there are still students who fall into the poor and fair categories, this can occur because the application of green skills requires commitment between the environment and access to clear information, students are not fully committed. Efforts to improve knowledge and action simultaneously require a more comprehensive learning approach. The theory and practice of green skills should ideally be taught as part of the main curriculum.

CONCLUSION

This research concludes, that the application of green skills has a good trend, although the good trend in knowledge, attitudes and actions has decreased. Class climate has no

influence towards green skills in vocational culinary practice, school culture has negative influence towards green skills in vocational culinary practice, information literacy has no influence towards green skills in vocational culinary practice. Simultaneously classroom climate, school culture and green skill information literacy has no influence on green skills in vocational culinary practice. For future research, other factors should be added that can improve the application of students' green skills in practical learning. The application of students' green skills also needs to be seen from habituation which is not limited to activities in schools but also families and community environments. In addition, it is necessary to see real action on classroom climate, school culture and student information literacy regarding green skills.

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