Profile Analysis of Creative Thinking Skills and Sustainability Awareness of Senior High School Students in Polewali Mandar Regency

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Abstract. 21st century skills are currently very important in the demands of student learning. However, some previous studies have shown that students have low levels of 21st century skills development. One of the important 21st century skills is creative thinking skills. In addition, in the current era, students must also have an awareness of sustainability, given the many natural phenomena that occur in their lives. This study aims to analyze the profile of the level of creative thinking skills and sustainability awareness in one of the senior high schools in Polewali Mandar Regency. This research is quantitative descriptive research conducted by giving a questionnaire of creative thinking skills and sustainability awareness. The questionnaire instrument was made as many as 15 statements, each of which had four alternative answers. The creative thinking skills questionnaire was made using four indicators namely fluency, flexibility, originality and elaboration, while sustainability awareness uses three indicators namely behavioral and attitudinal awareness, emotional awareness and practical awareness. The results showed that the profile of creative thinking skills in each indicator was 65% fluency in the moderate category, 74% flexibility in the creative category, 67% originality in the moderate category and 67% elaboration in the moderate category. As for the profile of student sustainability awareness on each indicator, namely behavioral and attitudinal awareness of 68% with the category of habits that are being carried out with a sufficient level, emotional awareness of 78% with the category of habits that always occur, and practical awareness of 59% with the category of habits that are being carried out with a sufficient level.

Keywords: Creative thinking skills; Sustainability awareness; 21st century skills

Introduction

21st century skills emphasize efforts to develop students' potential to be more readily trained in the process of learning. They are called "The four C's of 21st Century skills" which are critical thinking, creativity, collaboration, and communication skills (Alahmad et al., 2021; Bedir, 2019; Binkley et al., 2012; Geisinger, 2016; Gri & Care, 2014; OECD, 2019; Piirto, 2011; van Laar et al., 2019). The skills of the 21st century is very important and urgent for students in the current era. By practicing 21st century skills, students have a strong foundation to overcome learning challenges faced by students and also to prepare...
quality students for future generations (Afandi et al., 2019; Alismail & McGuire, 2015; Ahmad et al., 2021; Voogt & Roblin, 2012).

One of the keys 21st century skills is creative thinking skills. In the context of 21st century skills, creative thinking skills have helped individuals to deal with complex and unstructured challenges in innovative ways (Asad & Hussain, 2023; Fan & Cai, 2022). Creative thinking skills is defined as the ability to generate new ideas, innovative solutions, and see the issue from different perspectives (Erdem & Adiguzel, 2019; Munandar, 1977; Sasson et al., 2018; Torrance, 1977a; Treffinger et al., 2002). This skill is crucial to develop because it has a significant positive impact in many aspects of life (Buntat & Nasir, 2011; Ishlahul et al., 2023; Munandar, 1999; Putri & Alberida, 2022; Qomariyah & Subekti, 2021).

Activities that train students' creative thinking skills in learning are expected to support the development of ideas and insights to gain a new and meaningful understanding (Dilekçi & Karatay, 2023; Forte-Celaya et al., 2021; Helaluddin et al., 2023; Suherman & Vidakovich, 2022). This is also the case for creative thinking skills, as an activity that triggers interest in doing creative activities such as coming up with different ideas, developing multiple perspectives on events and conditions, thinking of uncommon solutions, or creating original ideas needed in learning activities (Dilekçi & Karatay, 2023; Kopcha et al., 2016; Muskita et al., 2020; Neolaka & Corebima, 2018; Rosidah & Kurino, 2021). Innovative thinking is the adequacy of ideas that a person puts forward in dealing with problems, events, or situations in terms of fluency, flexibility, originality and elaboration (Torrance, 1966). Fluency generates many ideas, flexibility develops different perspectives on the subject, originality is presenting original ideas that have never been put forward before and elaboration is detailing the details of an object, idea or situation so that it becomes more interesting.

In the 21st century, in addition to creative thinking skills, sustainability awareness is also important for students to have in the 21st century (Griffin et al., 2022; Morales-Baños et al., 2023). The 21st century is faced with serious global environmental challenges, including climate change, environmental degradation and natural resource depletion. Sustainability awareness is important for understanding the impact of human activities and taking action to protect the environment (Eid et al., 2022; Mylonas et al., 2021; Veckalne et al., 2022). Individuals who are aware of environmental issues can support efforts to achieve sustainable development goals or SDGs initiated by the United Nations through UNESCO. One of the efforts that have been established to increase sustainability awareness by UNESCO is through education for sustainable development (ESD). Sustainability awareness is at the core of efforts to create a more balanced world, where the economy, environment, and social communities support each other (Ridwan et al., 2021; Ruslindawati et al., 2022; Vilmala et al., 2022). This is important to overcome the challenges of the 21st century and create a sustainable future for upcoming generations.

Sustainability awareness consists of three categories, sustainability emotional awareness, sustainability attitude and behavior awareness and sustainability practice awareness (Hassan et al., 2010). Emotional awareness of sustainability shows learners' concern emotionally such as feeling concerned about environmental problems, feeling disappointed with various pollution that occurs and being aware of human responsibility for the environment. Attitudinal and behavioral awareness of sustainability shows that learners are aware and care about the importance of sustainability such as reading or watching environmental issues in various media, caring about motor vehicles. Awareness of sustainability practices shows whether or not a person has carried out activities that care about sustainability issues such as composting food waste into fertilizer, not using plastic bags and so on.

The first objective of this research is to identify and measure the levels of creative thinking skills among students in the 21st century, encompassing aspects such as fluency,
flexibility, originality, and elaboration. The second objective is to measure the level of sustainability awareness among students, which includes students' understanding of sustainability issues, their behavior and attitudes toward sustainability, emotional awareness, and sustainable practices.

**Methods**

This research was conducted in one of the high schools in Polewali Mandar city, West Sulawesi. This research is a descriptive research with quantitative methods conducted by giving a creative thinking skills questionnaire and a sustainability awareness questionnaire. The sample in this study was selected using convenience sampling technique, which is a sampling method chosen based on ease of data collection, and takes into account time, place, and sampling criteria (Sugiyono, 2018). The data collection technique is to use a creative thinking skills questionnaire instrument in the form of a questionnaire in the form of a statement using indicators by Torrance (1977), namely fluency, flexibility, originality, and elaboration. The instrument to determine the level of sustainability awareness of students was developed by modifying the instrument by (Atmaca et al., 2019) which consists of three indicators, namely behavioral and attitudinal awareness, emotional awareness, and practical awareness. The statements of each questionnaire were made as many as 15 statements for creative thinking skills and 15 statements for sustainability awareness. The scale used in this questionnaire is a Likert scale, which is a scale containing four answer options. In each statement in the instrument, four answer options are provided, namely strongly agree, agree, disagree and strongly disagree. The data analysis technique used was descriptive analysis of quantitative data from the creative thinking skills questionnaire and the sustainability awareness questionnaire.

**Table 1. Categorization**

<table>
<thead>
<tr>
<th>Category</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>( x &lt; M - SD )</td>
</tr>
<tr>
<td>Medium</td>
<td>( M - SD \leq x \leq M + SD )</td>
</tr>
<tr>
<td>High</td>
<td>( x &gt; M + SD )</td>
</tr>
</tbody>
</table>

To determine the category of creative thinking skills and sustainability awareness whether in the low, medium and high categories, the mean, maximum score, minimum score and standard deviation were calculated using the formula (Azwar, 2022) as follows:

Remark:
\( M \) = Mean
\( SD \) = Standard Deviation

Based on the questionnaire scores obtained, categorization is then made in the form of a percentage with the formula from (Ali, 2013) as follows:

\[
\text{Percentage (\%)} = \frac{\text{Total score obtained}}{\text{Maximum total score}} \times 100\% \quad (1)
\]

Then the percentage results of the statements from respondents are classified based on the categories previously determined. The determination of the level of criteria is grouped into 5 criteria (Sugiyono, 2018). Determination of the category of creative thinking
skills variables refers to research from (Qomariyah & Subekti, 2021) and sustainability awareness variables refer to research from (Hassan et al., 2010).

Table 2. Categorization of Creative Thinking Skills

<table>
<thead>
<tr>
<th>Creative (%)</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>85-100</td>
<td>Very Creative</td>
</tr>
<tr>
<td>70-84</td>
<td>Creative</td>
</tr>
<tr>
<td>55-69</td>
<td>Adequate</td>
</tr>
</tbody>
</table>

Table 3. Categorization of Sustainability Awareness

<table>
<thead>
<tr>
<th>Sustainability (%)</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 - 39.9</td>
<td>Practices that seldom or dislike to be done</td>
</tr>
<tr>
<td>40.0 - 69.9</td>
<td>Practices that are done/happened moderate/medium</td>
</tr>
<tr>
<td>70 - 100</td>
<td>Practices feelings that are most likely done/happened</td>
</tr>
</tbody>
</table>

Next, an analysis is conducted for each indicator to determine their contributions to students’ creative thinking skills and sustainability awareness. An analysis is also performed for each questionnaire statement.

Results and Discussion

Results of Creative Thinking Skills

The test results to determine the profile of students' creative thinking skills obtained the following data, can see in Table 4 and 5.

Table 4. Creative Thinking Skills Questionnaire Results

<table>
<thead>
<tr>
<th>No.</th>
<th>Descriptive Statistics</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mean</td>
<td>67.5</td>
</tr>
<tr>
<td>2.</td>
<td>Standard Deviation</td>
<td>7.5</td>
</tr>
<tr>
<td>3.</td>
<td>Maximum Score</td>
<td>60</td>
</tr>
<tr>
<td>4.</td>
<td>Minimum Score</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 5. The Level of Students’ Creative Thinking Skills

<table>
<thead>
<tr>
<th>No</th>
<th>Score</th>
<th>Category</th>
<th>Total</th>
<th>Creative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>&lt;60</td>
<td>Low</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>60-75</td>
<td>Medium</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>&gt;75</td>
<td>High</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Based on Table.4 shows that the mean value is 67.5. Mean describes the average value of a group of data. In this context, the mean value of students' creative thinking skills is 67.5. This means that overall, students tend to have an above-average level of creative thinking skills, but for a deeper understanding, it is necessary to look at the distribution of the data entirely. The Standard Deviation value is 7.5. Standard deviation measures the extent to which data is spread out from the mean. In this case, the standard deviation is 7.5, which is a measure of the variability of the data. This relatively low standard deviation indicates that most of the students' creative thinking skills scores are quite close to the mean of 67.5. This means that most students have similar skill levels,
but there is still variation in the level of creative thinking skills. The maximum score is 60 which is the highest score that can be achieved in the creative thinking skills questionnaire. With this maximum score, we can assess the extent to which a person or group can achieve an optimal level of creative thinking skills. Meanwhile, the minimum score is 15 which is the lowest score that can be achieved in the creative thinking skills questionnaire. This minimum score gives an idea of the lowest level of creative thinking skills that may exist among the students measured in this study. Based on Table. 5 shows that the overall level of creative thinking skills of the majority of students (100%) is in the "Low" category, meaning that all students in the sample have a creative thinking skills score below 60. This requires students' creative thinking skills to be improved.

![Figure 1. Achievement of Each Indicator of Creative Thinking Skills.](image)

The data on the achievement of creative thinking skills per statement item are divided into four indicators: fluency, flexibility, originality, and elaboration. Table 6 shows the mean scores and the total percentage of student responses.

<table>
<thead>
<tr>
<th>No</th>
<th>Statement</th>
<th>Mean</th>
<th>Creative (%)</th>
<th>Total (%)</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fluency I enjoy the challenge of learning that requires creative thinking in biology.</td>
<td>2.60</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Fluency I feel I have a strong imagination and can generate creative ideas.</td>
<td>2.70</td>
<td>68</td>
<td>65</td>
<td>Adequate</td>
</tr>
<tr>
<td>3.</td>
<td>Fluency I often look for creative ways to solve everyday problems.</td>
<td>2.43</td>
<td>61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. I often try to learn in different ways to understand or overcome difficult biology concepts. Flexibility
   2.67  67

5. I often seek inspiration from various sources to develop my thinking. 3.00  75

6. I feel that learning biology requires creative thinking in learning. 3.07  77

7. I feel that creative thinking is an important skill in my work and life. 3.43  86

8. I feel that creative thinking in biology can help in overcoming scientific challenges. 3.00  75

9. I have the ability to see connections between different aspects of biology that may seem unrelated at first glance. Originality
   2.37  59

10. I often come up with new/unusual ideas for biology problems. 2.27  57

11. I like to work together with my friends to create new solutions or creative ideas. 3.20  80
    67 Adequate

12. I like to try new things and am not afraid to fail. Elaboration
    2.53  63

13. I have the ability to generate creative ideas in a variety of situations. 2.50  63
    67 Adequate

14. I can identify complex problems 2.37  59
and develop unique solutions.

15. I feel that creative thinking is a skill that can be improved with practice and practicum especially in biology subjects.

3.17  79

In Figure 1, there is information about the achievement of each indicator of students' creative thinking skills, with different indicators and measurements in the form of means and percentages which are then classified into several categories. The mean for the fluency indicator is 2.60, with a percentage of 65%, which means that the level of fluency in students' creative thinking is "Fair." This means that students in the sample may have the ability to generate ideas. This means that students in the sample may have the ability to generate ideas or solutions, but still need improvement to reach a higher "Good" or "Creative" level. In line with the results of research by (Wijaya et al., 2022) showed results in the fluency aspect which amounted to 58.33% with sufficient criteria. The same results in research by (Alkariim & Aini, 2023) were 30 students out of 44 students with a percentage of 68.18% who were categorized as quite creative. One of the factors that influence why in the fluency indicator students still get a sufficient category is because students are not used to activities that involve creative thinking skills so that students find it difficult to face creative challenges (Alkariim & Aini, 2023; Wijaya et al., 2022).

The mean for the flexibility indicator is 2.97, with a percentage of 74% which means that the level of flexibility in creative thinking is "Creative." This is a positive result, which indicates that students in the sample have the ability to think flexibly and create various alternatives or solutions in creative situations. In line with the results of research by (Wijaya et al., 2022) on flexibility indicators obtained 64.48% with the creative category. Meanwhile, the results of research by (Yulidasari, 2022) showed that students obtained results on the flexibility indicator in the very creative category with a percentage of 83.3%. The high level of flexibility is one of the factors because of the good collaboration between teams and also good critical and analytical thinking skills can also support flexibility of thinking. Students who can analyze problems in depth also tend to have the capacity to consider various alternatives and solutions (Rahayuningsih et al., 2020; Siregar et al., 2022; Yulidasari, 2022).

The result of the mean calculation on the originality indicator is 2.67, with a percentage of 67% which means that the level of originality in creative thinking is "Sufficient." This indicates that students have the ability to generate ideas or solutions that may have elements of originality, but still need more development to reach a higher level of "Good" or "Creative". In line with research conducted by (Firdaus et al., 2018) obtained results on the originality indicator with a sufficient category of 58.5%. Then in research by (Hasanah et al., 2023) obtained a value on the originality indicator in the medium category. The value of the originality indicator that has not been maximized can occur with several factors, for example students find it difficult to create ideas that are completely new and have never been thought of before and also some students do not have mature creative skills to produce very original ideas. Originality is formed from experience and the development of creative skills (Firdaus et al., 2018; Hasanah et al., 2023).

The elaboration indicator obtained a mean score of 2.68, with a percentage of 67% which means that the level of explanation in creative thinking is "Sufficient." Students are able to provide explanations or additional details to their ideas or solutions, but there is still room for improvement to reach a higher level. In line with research by (Yulidasari,
Irawan, et al. (2022) obtained a value on the elaboration indicator of 41.6% which is categorized as sufficient. Also, research by (Firdaus et al., 2018) obtained the same category, namely enough with a percentage of 59.5%. The value of the elaboration indicator that has not been maximized can occur because students feel unsure or lack confidence in providing in-depth details in their creative thinking. Uncertainty or lack of confidence in their ideas hinders their ability to elaborate. Creative thinking skills, including the ability to develop ideas in detail, can take time to develop. Students who have not been trained in this aspect may need more practice and experience (Firdaus et al., 2018; Yulidasari, 2022).

The results of one’s creative thinking skills can be low due to various factors, such as lack of practice and experience in exploring new ideas, fear of failure that inhibits experimentation with innovative solutions, limitations in the approach to problems that prevent the development of creative ideas, environmental support that does not promote creativity, and habits and confidence that limit exploration of broader creative potential (Ayu et al., 2023; Aziz, 2023; Purwinda & Permatasari, 2023). Improving creative thinking skills is crucial in various contexts, both individually and collectively, due to its significant benefits. Firstly, creativity enables individuals to develop novel and innovative solutions to complex problems, enhancing efficiency and effectiveness in daily tasks while fostering discoveries that can transform our understanding and interactions with the world (Adamovic, 2022; Dei, 2022; Drannyk & Svidlo, 2022; Rominger et al., 2019). Secondly, creative thinking supports personal development by facilitating adaptation to rapid changes in work environments and personal life, cultivating the mental resilience needed to confront challenges and seize opportunities in innovative ways (Wan, 2023; Xin-Zhu et al., 2022; Yelavarthi, 2022). Thirdly, in a global social and economic context, creativity is pivotal in creating added value that distinguishes individuals or organizations from competitors, promoting economic growth and sustainable social development (Boonpracha, 2023; Diawati et al., 2023; Fan & Cai, 2022; Melnikas, 2019). Therefore, enhancing creative thinking skills not only benefits individuals personally but also has a broad positive impact on society and the world as a whole.

**Results of Sustainability Awareness**

The test results to determine the students' sustainable awareness profile obtained the following data, can be seen in Tables 7 and 8.

**Table 7.** Sustainability Awareness Questionnaire Results

<table>
<thead>
<tr>
<th>No</th>
<th>Descriptive Statistics</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Mean</td>
<td>67.5</td>
</tr>
<tr>
<td>2.</td>
<td>Standard Deviation</td>
<td>7.5</td>
</tr>
<tr>
<td>3.</td>
<td>Maximum Score</td>
<td>60</td>
</tr>
<tr>
<td>4.</td>
<td>Minimum Score</td>
<td>15</td>
</tr>
</tbody>
</table>

**Table 8.** Students' Sustainability Awareness Level

<table>
<thead>
<tr>
<th>No</th>
<th>Score</th>
<th>Category</th>
<th>Total</th>
<th>Sustainability (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>&lt;60</td>
<td>Low</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>60-75</td>
<td>Medium</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>&gt;75</td>
<td>High</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 7 presents the results of the questionnaire on Sustainability Awareness some descriptive statistics which include the mean value of awareness of sustainability is 67.5. This indicates the average level of awareness that respondents have towards sustainability issues. The Standard Deviation value is 7.5. This relatively low standard deviation indicates
that most of the responses collected tend to be close to the mean value of 67.5. This means that most respondents have a similar level of awareness related to sustainability issues. The maximum score is 60 and the minimum score is 15. Based on Table. 8 shows that there are 30 students in the "Low" category, which accounts for 100% of the total students. This means that all students in the sample have a sustainability awareness score below 60. The "Low" category indicates that the majority of students have a low level of sustainability awareness. This indicates the need for efforts to increase awareness of sustainability issues among students in the sample.

![Figure 2. Achievement of Each Indicator of Sustainability Awareness](image)

The data on the achievement of sustainability awareness statement item is divided into three indicators, namely behavior and attitude awareness, emotional awareness, and practice awareness. Table 9 shows the mean score and total percentage of student responses.

<table>
<thead>
<tr>
<th>No</th>
<th>Statement</th>
<th>Mean</th>
<th>Sustainability (%)</th>
<th>Total</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I believe that individual behavior has an important influence on the environment and society.</td>
<td>3.27</td>
<td>82</td>
<td>68</td>
<td>Practices that are done/happened moderate/medium</td>
</tr>
<tr>
<td>2.</td>
<td>I always try to choose environmentally friendly products when shopping.</td>
<td>2.33</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I always try to conserve</td>
<td>2.60</td>
<td>65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Irawan, et al.: Profile Analysis of Creative Thinking Skills and Sustainability

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>I always try to reduce plastic waste and plastic pollution in my environment.</td>
</tr>
<tr>
<td>5.</td>
<td>I feel that my role in the field of biology is to increase the understanding of the mutual relationship between humans, the environment and the sustainability of social life.</td>
</tr>
<tr>
<td>6.</td>
<td>I feel concerned and sad when I see news about environmental damage and climate change.</td>
</tr>
<tr>
<td>7.</td>
<td>I often feel nervous when I think about the impact of climate change on future generations.</td>
</tr>
<tr>
<td>8.</td>
<td>I feel motivated by individuals and groups who strive for sustainability and efforts to preserve the environment.</td>
</tr>
<tr>
<td>9.</td>
<td>I feel very upset when I see actions that damage the environment without proper consideration.</td>
</tr>
<tr>
<td>10.</td>
<td>I feel passionate about contributing to nature</td>
</tr>
</tbody>
</table>

Emotional awareness

Practices feelings that are most likely done/happened
conservation and sustainability efforts.

**Practice awareness**

11. I have reduced the use of single-use plastics in my daily life.  
   - [2.30]  
   - [58]

12. I regularly recycle recyclable waste.  
   - [2.43]  
   - [61]

13. I try to reduce my personal vehicle activities by using public transportation, cycling or walking.  
   - [2.30]  
   - [58]

14. I actively seek information on sustainable activities that I can implement in my daily life.  
   - [2.30]  
   - [58]

15. I prioritize the use of renewable energy and energy saving at home.  
   - [2.50]  
   - [63]

Figure 2 shows the results of a questionnaire about students' sustainability awareness which is divided into three main indicators: Behavior and attitude awareness, emotional awareness and sustainability practice awareness. The mean for the behavior and attitude awareness indicator is 2.73, with a percentage of 68%. This indicates that on average students have reached the level of "Habits already in place/occurring at a moderate level" in terms of behavior and attitude awareness related to sustainability. This indicates that most students in the sample have adopted behaviors and attitudes that support sustainability, but there is still room for improvement. This is in line with the research results from (Hassan et al., 2011; Salsabila et al., 2019) that the behavior and attitude awareness indicator is in the medium category that students may not really have a high awareness in addressing environmental issues.

The mean for the emotional awareness indicator is 3.11, with a percentage of 78%. This means that students have reached the level of "Frequently/always do/happen" in terms of emotional awareness related to sustainability issues. This indicates that most students in the sample feel concerned, sad, nervous and motivated in relation to environmental and sustainability issues. They also felt eager to contribute to nature conservation and sustainability efforts. This is in line with the results of research by (Agusti et al., 2019) that emotional awareness is categorized as high compared to other aspects. Also, research by (Rini & Nuroso, 2022) obtained high results compared to other categories so that students’ emotional awareness of sustainability is the best. However, this concern must be balanced with a real attitude in a sustainable manner.
The sustainability practice awareness indicator has a mean of 2.37 and is placed in the "Practices that are done/occurred moderate/medium" category with a percentage of 59%. This indicates that most students in the sample have a moderate level of sustainability practice awareness or are happening in their daily lives. This indicator measures the extent to which students are aware of and implement practices that support sustainability in their daily lives. The results show that most students have a moderate level of awareness related to sustainable practices. In line with the results of research by (Ridwan et al., 2021) is the indicator with the lowest achievement, this is because students do not know or do not understand sustainable practices that they can apply in their daily lives. They may not know concretely what they can do to support sustainability. Some students may not have sufficient understanding of the impacts of environmental damage and climate change. They may not realize how their actions can contribute to these problems (Atmaca et al., 2019; Ekamilasari et al., 2021).

The importance of sustainability awareness in student education is crucial in today's era. By integrating principles of sustainability into the curriculum, students can learn to appreciate the environment, develop sensitivity towards global issues such as climate change and sustainable resource management, and promote a sense of responsibility towards future generations (Lafuente-Lechuga et al., 2024; Malt & Majid, 2023; Smith et al., 2023; Tague, 2022). This awareness not only prepares them to become more conscientious global citizens but also equips them with the skills and knowledge needed to address future challenges sustainably (Lafuente-Lechuga et al., 2024; Malt & Majid, 2023; Morales-Baños et al., 2023).

**Conclusion**

Based on the data analysis presented in the paper above, it can be concluded that students' creative thinking skills in general tend to be above average, although there are still variations in the level of creative thinking skills among students. The indicator results show that students have a fairly good level of flexibility of thinking and flexibility, but still need development in terms of originality and elaboration. These results reflect that approaches to improve students' creative thinking skills can focus on specific aspects that require improvement, such as enhancing creativity and the ability to develop ideas in detail. Meanwhile, in terms of sustainability awareness, results show that most students in the sample have a low level of awareness regarding sustainability issues. This highlights the importance of efforts to raise students' awareness of environmental and sustainability issues. Although there are indications that students have high feelings of empathy and concern regarding environmental issues, there needs to be concrete steps that encourage them to adopt sustainable behaviors and attitudes in their daily lives. This reflects the challenge of educating students on sustainable practices and improving their understanding of environmental impacts and climate change. Thus, there is a need for educational programs that focus more on the implementation of sustainable practices and building a strong awareness of sustainability issues among students.

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