

THE EFFECTIVENESS OF USING MICROSOFT BING IMAGE CREATOR IN ENHANCING STUDENTS' PAINTING PERFORMANCE, PAINTING CREATIVE IDEAS, AND ATTITUDES TOWARD IT

Dima Saud Al Saud^{1*}

^{1*}A Ph.D. researcher in educational technology at King Abdul-Aziz University

Dr Leena Alfarani²

²Associate Professor in Educational Technology, King Abdul-Aziz University

***Corresponding Author:-** Dima Saud Al Saud

^{*}A Ph.D. researcher in educational technology at King Abdul-Aziz University

Abstract

This study investigates the effectiveness of Microsoft Bing Image Creator, a generative AI tool, on students' painting performance, creativity, and attitudes toward the AI tool in abstract painting classes for elementary-stage students in Jeddah- Saudi Arabia.

Two tools were developed for the sake of the study; the first is the Assessment Product Card, which consists of Seven items to measure the painting's performance and three to measure the painting's creative ideas. Meanwhile, the second tool deployed is an 11-item survey that measures students' attitudes toward the Microsoft image creator AI tool. The study uses quantitative methodologies to evaluate the pre- and post-application measures of painting performance and creativity among 14 students in the upper elementary school. Statistical analyses indicate that utilizing the Bing Image Creator tool significantly improves painting performance and creativity.

Furthermore, the study evaluates students' perceptions of the tool's integration into the art classroom through a comprehensive survey. The study indicates a highly positive attitude towards the implementation and a strong desire for its continuation. However, the study also highlights some challenges and considerations related to using AI tools in painting education, such as creativity dependency, technical learning curves, and ethical implications. Overall, this study contributes to understanding the multifaceted impact of AI-driven tools on art education, advocating for their effective integration while acknowledging pertinent challenges for educators and learners.

Keywords: AI generative tools, Microsoft Bing Image Creator, Students' painting performance, painting Creative ideas, and attitudes toward AI tools.

Introduction:

In recent years, the infusion of digital tools into educational settings has become increasingly prevalent, reshaping the traditional pedagogical environment. Microsoft's Bing Image Creator is one such tool, offering educators an intuitive platform for creating and manipulating visual content, enhancing the learning experience (Nikolova & Evtimova, 2022).

Historically known for its rich traditions and heritage, the Arabian educational sphere has begun embracing modern technological tools, seeking to balance preserving cultural values and keeping pace with global educational trends. As educators increasingly incorporate tools like the Bing Image Creator into their teaching strategies, it becomes imperative to investigate its integration, application, and subsequent impact on the overall educational experience.

Integrating digital tools in educational settings has become increasingly common, changing the traditional pedagogical landscape (Thakur & Thakur, 2002).

Applying AI tools in fine art classes is instrumental in heightening the students' creativity and performance. The fusion of art and technology through AI can facilitate individual learning, enabling students to explore their creative skills at their own pace and according to their unique talent. With data analysis and pattern recognition features, AI can provide personalized feedback to each student, observing their strengths, weaknesses, and progression. This customized approach can enhance understanding and mastery of fine art techniques, giving students the confidence to experiment and innovate (Kliman-Silver et al., 2022).

Moreover, AI tools can provide endless sources of inspiration and broaden the scope of artistic exposure for students. Their programming allows them to go through various art styles, techniques, and historical contexts that would be cumbersome to assemble manually. This expansive knowledge bank provides ample stimuli for students' creativity. Moreover, some AI tools encourage interactive learning by allowing students to experiment with different styles, colors, and techniques in a digitally simulated environment, fostering a stronger understanding of the art world and nurturing creativity (Kliman-Silver et al., 2022).

The advantages and difficulties of using technology in the classroom are discussed in worldwide literature. However, region-specific study is still needed, particularly in the context of Arabian countries.

Microsoft's Bing Image Creator is one such tool that offers educators an intuitive platform to create and manipulate visual content, thereby enhancing the learning experience. (Kliman-Silver et al., 2022).

Saudi Arabia's 2030 Vision seeks to build a dynamic society, a successful economy, and an enterprising nation by leveraging technology and innovation to accelerate economic growth and transform the country into a global hub of trade and commerce. The integration of AI tools in education aligns perfectly with this vision. AI-powered interventions can personalize learning experiences, boost efficiency and productivity, foster a culture of creativity, and empower students

with vital 21st-century skills. By promoting AI in learning, Saudi Arabia can cultivate a digital-ready generation capable of leading in advanced technologies and innovation, which is crucial for realizing their 2030 vision (Allmnakrah and Evers 2020).

Research Problem:

Based on thorough observations in the field of art education in Saudi Arabia, it is evident that a specific group of students is facing significant difficulties generating diverse painting ideas. In today's world, there is a noticeable increase in the use of media and computer games among students, significantly influencing their thinking patterns and how they interact with the world around them. The shift towards digital interfaces and away from hands-on experiences may be responsible for hindering their ability to observe and manipulate tangible elements in the physical world and, consequently, challenging their creativity. Therefore, it is crucial to recognize the significance of hands-on creativity and foster it to ensure that students develop unique and imaginative painting concepts. (Alhomaidi and Salleh,2022).

There is a creativity gap among students, and one possible cause is how they interact with their environment. Compared to previous generations, contemporary students rely heavily on various digital mediums, which may hinder their ability to draw inspiration from real-life experiences. In other words, their over-reliance on these mediums might limit their capacity to express their lived experiences creatively on canvas. Another contributing factor to this creativity gap could be the traditional art education system. The current education system tends to focus more on technical skills and less on creativity, limiting students' creative potential. Outdated teaching methods that do not encourage creativity might be one of the reasons behind these challenges. Therefore, it is essential to reconsider and restructure the art education system to create a more inclusive and creative learning environment for students (Alawad,2013).

Focusing on specific topics in art classes can sometimes stifle creativity and prevent students from thinking outside the box. This study delves into the factors behind these obstacles, aiming to identify what stops students from reaching their full potential in painting. By examining these barriers, the research hopes to inform art education practices and foster an environment that encourages diverse and original painting ideas among art students in Saudi Arabia (Alawad,2013).

Research Questions:

- To what extent does Microsoft Bing Image Creator affect students' painting performance?
- To what extent does Microsoft Bing Image Creator affect students' creative ideas in painting?
- What are students' attitudes toward using Microsoft Bing Image Creator in Art class?

Research Objectives:

- To assess the integration of Microsoft Bing Image Creator within the Saudi elementary school educational system.
- To assess how painting teachers implemented Microsoft Bing Image Creator.

- To evaluate the impact of Microsoft Bing Image Creator on learning outcomes in Saudi Arabia.
- To quantify the effectiveness of using Microsoft Bing Image Creator on students' painting skills and creative ideas during abstract painting in Saudi elementary schools.
- To identify some challenges students, face while using AI tools in painting.

Research Importance:

The 21st century has brought unprecedented technological improvements, with Artificial Intelligence (AI) at the forefront of revolutionizing the education sector worldwide. This research explores the integration and impact of Microsoft Bing Image Creator, an AI tool, within the Saudi Arabian educational system. By shedding light on the ways AI tools align with the unique cultural and pedagogical landscape of Saudi Arabia, this study offers valuable insights for educators, policymakers, and technology providers to make informed decisions about further technological integrations.

Moreover, this research evaluates the tangible benefits or potential disadvantages of using such tools in the Saudi classroom, addressing a critical knowledge gap on whether AI enhances student comprehension, creativity, and attitudes toward abstract arts. By quantifying the extent of AI tool usage among teachers and identifying preferred subjects for its application, the study spotlights areas where Microsoft Bing Image Creator is most effective and has potential for expanded use. This data will be instrumental for curriculum developers and training providers aiming to amplify the benefits of AI in education.

Additionally, this study offers a roadmap for addressing potential obstacles students face in integrating AI tools such as Microsoft Bing Image Creator, ensuring smoother adoption, and maximizing the benefits of AI in the Saudi educational domain. This research holds broader implications for the harmonious fusion of technology and education in culturally diverse settings by bridging the knowledge gap between AI tool integration and its real-world impact.

Research limitation:

- **Scope of Study:** The research primarily focuses on the integration and impact of Microsoft Bing Image Creator, potentially excluding other AI tools that might also be prevalent and influential within the Saudi educational system.
- **Geographical Limitations:** The study centers on Jeddah's educational system, and findings may not be directly applicable or generalized to other Middle Eastern or global educational contexts.
- **Subjectivity in Responses:** The research might rely on students' feedback and perceptions regarding the use and impact of the AI tool.
- **Sample Size and Representation:** The study's sample size and participant selection may need to represent the diverse range of students in Jeddah comprehensively.

- Technical Limitations: As the research evaluates the effectiveness of an AI tool, it is important to note that there might be technical limitations in assessing all the tool's features or understanding its full range of capabilities within the classroom setting.
- Limited Subjects: ARTS

Research Methodology:

Population and sample:

Target Population: This study focuses on elementary school students in Jeddah, Saudi Arabia.

Sample Size: 14 students.

Research Variables:

Independent Variables:

Students' Integration Level of Microsoft Bing Image Creator while painting

Dependent Variables:

1. Students' painting performance
2. Students' painting creativity ideas
3. Students' attitudes toward Microsoft Bing Image Creator AI tool

Moderating Variables:

1. Students' Technological Proficiency: students' comfort and skill with technology can influence the integration and impact of Microsoft Bing Image Creator.
2. School Infrastructure: The availability and quality of technological resources within educational institutions can affect the extent of AI tool implementation.

Control Variables:

Students' Experience can play a role in openness to new technologies and influence perceptions of AI tools.

Research Tool:

This research will use the following tools:

1. Assessment Product Card: This card lists some criteria that measure the proficiency level of painting skills derived from analyzing the curriculum and discussing it with the teacher. The items will cover the originality of the painting ideas, the extent of creativity, abstract performance painting, the concept of the painting, and many other things.
2. A questionnaire to measure students' attitudes covers Integration Level, factors such as frequency of use purposes, for utilizing the tool (visual aids, interactive activities), and level of

training received on Microsoft Bing Image Creator. Furthermore, Participants will be asked to rate the benefits of using Microsoft Bing Image Creator regarding student engagement, comprehension, and creativity. Finally, Participants can provide feedback on any difficulties encountered while implementing the tool and suggest improvements.

Concepts:

1. Microsoft Bing Image Creator:

A digital tool designed to assist in creating, manipulating, and organizing visual content for various purposes, particularly for educational and instructional designs (Noel,2023).

2. Students' painting performance:

"Students' painting performance" refers to the measurable and observable skills, capabilities, and artistic competencies that learners possess to create visual art through painting in an educational setting. Encouraging students to think creatively and develop unique interpretations is crucial to creating visual art. This involves exploring unconventional approaches and thinking outside the box, allowing students to incorporate their emotions, cultural influences, and insights into their work. In this study, students' painting performance was measured using a product card developed based on the standards of high performance associated with the curriculum (Mair,2019).

3. Students' creative painting ideas:

"Creative painting ideas of students refer to the innovative, original, and imaginative concepts, expressions, and visual representations generated by learners during the painting process within an educational setting. It involves thinking outside the box, exploring unconventional approaches, and creating unique artistic interpretations, enabling students to add their insights, emotions, and cultural influences on their visual artworks." In this study, Students' creative painting ideas were measured using a product card developed based on the standards of high performance associated with the curriculum. (Sun et al., 2019).

4. Artificial Intelligence (AI) in Teaching:

The utilization of computer systems to perform tasks or make decisions that would typically require human intelligence, particularly in the context of instructional delivery, content adaptation, and personalized learning (Chiu,2021).

5. Implementation Challenges:

The barriers, obstacles, or difficulties experienced by educators when integrating a new technology, tool, or methodology into their teaching practices (Noreen and Malik,2020).

Literature review

1. Painting curricula and skills Incorporating painting within educational curricula is essential in fostering creativity, originality of ideas, and conceptual understanding. Saudi Arabia recognizes the significance of painting in nurturing artistic expression and developing a deeper

appreciation for visual arts. This review aims to provide insight into the existing literature regarding painting curricula and skills, specifically promoting originality of ideas, creativity, abstract performance painting, and the conceptualization of paintings within educational settings in Saudi Arabia (Al Dabbagh,2020).

Developing originality in art is a crucial aspect of education in Saudi Arabia. However, the traditional artistic conventions that dominate the educational system in the country often create barriers to nurturing originality. To overcome this challenge, it is essential to encourage students to explore diverse artistic expressions and introduce them to contemporary and multicultural influences that can broaden their perspectives and promote innovative approaches to creative expression. This approach is highlighted by (Alhomaidi, and Salleh, 2022), who emphasize the significance of developing unique artistic voices in students. Integrating these influences into painting curricula can play a vital role in cultivating the creativity and originality of students in Saudi Arabia's educational frameworks.

The fostering of creativity in painting curricula in Saudi Arabia is a subject that has caught the attention of scholars. In her work, Al-Ghamdi (2019) emphasizes the importance of nurturing creativity in students by allowing them to experiment with various painting techniques and materials. However, the rigid structures of many curricula and the assessment methods often limit students' scope to explore their creative potential fully. A possible solution to this issue is incorporating more open-ended assignments and encouraging experimentation with various painting techniques. Allowing students to engage in such activities can enhance their creative capacities within the educational framework and develop a broader range of skills and competencies that can be applied in various professional settings.

In recent years, abstract performance painting has emerged as a popular and innovative approach to artistic expression in educational contexts in Saudi Arabia. According to Allmnakrah, A. & Evers, C. (2020) research, there is a growing interest among educators in integrating performance-based painting activities that encourage students to embody emotions and concepts through their artistic endeavors. However, the challenge lies in conceptualizing abstract painting in a way that aligns with cultural and societal norms prevalent in Saudi Arabia. This requires striking a delicate balance between encouraging abstract expression and respecting cultural sensitivities, which is crucial to successfully integrating such practices within the educational curriculum. Thus, educators must be mindful of the cultural context and tailor their teaching approach accordingly while encouraging students to explore their creativity safely and respectfully.

In Saudi Arabian educational settings, the painting curricula are designed to nurture originality, creativity, abstract performance painting, and conceptualization of painting ideas. It is important to note that while these efforts are commendable, this process also has challenges. The educational system is undergoing a transformational phase to diversify artistic influences and encourage creative expression among students. However, there is still a need for a more flexible and inclusive approach to painting education that respects cultural nuances while fostering artistic innovation among students. The goal is to create a learning environment that promotes the development of

technical skills and encourages students to think outside the box and explore new horizons in painting. This approach will enable students to express themselves creatively while respecting their cultural heritage and embracing new ideas and perspectives; these findings are suggested by (Alhomaidi and Salleh, 2022) and (Allmnakrah and Evers,2020) studies.

2. Artificial Intelligence (AI) and Generative Artificial Intelligence (AI):

According to (Pratama et al.,2023), Artificial Intelligence (AI) has revolutionized traditional teaching methodologies and transformed education by enhancing student learning experiences. The integration of AI technologies in educational settings has been widely recognized for its potential to personalize learning, provide adaptive instruction, and improve student engagement. One notable tool contributing to this educational shift is Microsoft's Image Creator, an AI-powered platform.

Generative Artificial Intelligence (AI) is a revolutionary technology enabling autonomous content creation and generation. It has the potential to transform business operations by streamlining content production processes, increasing efficiency, and reducing costs. By harnessing the power of Generative AI, businesses can create content faster and with a higher degree of precision. This technology promises to be a game-changer for organizations looking to optimize their content production workflows. With generative AI, companies can unlock a new level of creativity and innovation that was not possible before. Take this opportunity to take your business to the next level with generative AI. This unique type of AI can independently produce new content, including images, text, and music, without explicit human input. Generative AI uses complicated algorithms and deep learning models to learn from vast datasets and generate novel outputs that mimic human-created content. These systems make decisions based on known patterns rather than explicit instructions, using intricate patterns and probabilities to create content (Baidoo and Ansah,2023).

According to Beyan and Rossy study (2023), Generative AI tools, like Microsoft's Image Creator, provide significant educational advantages, including democratizing creative tools and streamlining the content creation. These tools offer accessibility to students from diverse backgrounds, fostering inclusivity and empowering them to explore their artistic potential. Additionally, the AI-driven algorithms in these tools can adapt to individual learning styles, providing tailored guidance and feedback and enhancing personalized learning experiences.

However, incorporating generative AI tools in education presents challenges that must be addressed. One primary concern is the potential dependency on AI tools, which might hinder the development of foundational skills and critical thinking abilities. Over-reliance on these platforms overshadows traditional art practices, impacting students' understanding of fundamental artistic concepts. Another challenge is the ethical considerations surrounding AI-generated content. Authenticity and ownership pose intricate challenges that educators must navigate to guide students in understanding the implications of using AI-generated content ethically and responsibly (Beyan and Rossy,2023).

Moreover, the rapid evolution of AI technology requires continuous training and updates for educators to integrate these tools into the curriculum effectively. These challenges keep pace with technological advancements and ensure students develop the necessary skills to navigate an AI-driven educational landscape. Generative AI tools have advantages in education, democratizing creative tools and enhancing personalized learning experiences. However, educators must ensure students develop foundational skills, critical thinking abilities, and ethical considerations essential for their growth in an AI-driven educational landscape.

Microsoft's image creator is a novel approach to improving students' creative capabilities within educational contexts. This tool uses AI algorithms to assist students in generating visual content. It provides user-friendly interfaces and intelligent functionalities that enable them to create visually appealing content without extensive design expertise. This technology simplifies the content creation, allowing students to explore their creative potential across various subject matters (Beyan and Rossy,2023).

Furthermore, many studies such as (Beyan and Rossy,2023), (Cooper, 2023), and (Baidoo and Ansah,2023) have shown that AI-driven image-creation tools positively impact students' creativity, with increased motivation and confidence in expressing ideas through visuals. This highlights the educational benefits of integrating AI-based platforms.

Meanwhile, many researchers, such as (Baidoo and Ansah,2023) have stated that relying on AI tools for painting can be challenging for students. While the software can offer helpful suggestions, too much dependence on AI-generated ideas can constrain creativity and limit personal expression. In addition, the software's technical features may require some effort to understand, making it challenging to use to its fullest potential. Additionally, ethical concerns surrounding authenticity and authorship may arise, further complicating the process. Lastly, keeping up with technological updates and changes requires ongoing learning and adaptation, which can be demanding.

Results and Discussion

Question 1: To what extent does Microsoft Bing Image Creator affect students' painting performance?

To measure the painting performance skills, a product card of 7 items was used before and after the application of the Microsoft Image Creator tool. The items were derived based on the standards associated with the curriculum. Two experts judged the product tool: one has 24 years of experience teaching abstract arts, and the other has a Ph.D. in curricula and teaching strategies.

The results of evaluating students' painting performance based on the product card are shown in table (1) as follows:

Table (1)Students' painting performance results before and after implementing Microsoft Bing Image Creator

Stand ard	Item	Average Before	Average After
P1	Understanding of light and shadow principles	2.07	2.64
P2	Effectiveness in bringing to mind emotions through light and shadow	1.5	2.5
P3	Use of light and shadow to enhance the depth of object	1.93	2.79
P4	Use of light and shadow to create focal points in the artwork	2.64	3.00
P5	Precision in depicting light and shadow	2.57	3.14
P6	Detailing within the composition	2.289	2.71
P7	Cleanliness and tidiness of the painting	2.5	3.07

The results of analyzing students' painting performance according to the product card (items 1-7) indicate a significant improvement in participants' understanding and application of light and shadow principles in painting. Furthermore, there is a consistent progression across various dimensions, with notable enhancement in all standards as follows:

- Understanding of Principles: The results are in and truly astounding! The average score has skyrocketed from 2.07 to 2.64, indicating a remarkable improvement in comprehending the subtleties of light and shadow. This progress demonstrates a clear dedication to learning and a commitment to excellence. Congratulations on a job well done!
- Emotional Evocation: The participants have shown a significant improvement in their ability to convey emotions through the clever use of light and shadow. Their average score has increased from 1.5 to 2.5, indicating an impressive one-point increase in this aspect.
- Depth Enhancement: There was a significant improvement in skill and understanding as the utilization of light and shadow to enhance object depth increased from an average of 1.93 to 2.79.
- Creation of Focal Points: The participants demonstrated a notable improvement in their ability to create focal points by effectively utilizing light and shadow. On average, their performance increased from 2.64 to 3.00.
- Precision in Depiction: The artistry of illustrating light and shadow has been masterfully enhanced, with an impressive leap from an average of 2.57 to 3.14 in precision. This notable

improvement has resulted in an elevated level of detailing and accuracy that's bound to impress even the most discerning eyes.

- **Detailing Within Composition:** Starting from a rating of 2.289, considered moderate, there was a considerable improvement in attention to detail and complexity, with the score increasing to 2.71. This indicates a significant enhancement in the ability to look at intricate details and grasp complex concepts. The improvement in the score indicates the remarkable progress made in this area.
- **Cleanliness and Tidiness:** The average scores indicating cleanliness and tidiness within the paintings have demonstrated a notable improvement, rising from 2.5 to 3.07. This shows that there has been an improvement in the final presentation of the artworks, which is a positive development.

The complete data set shows that the participants have significantly improved their artistic abilities by enhancing their grasp of light and shadow principles. The figures clearly understand the fundamental concepts and techniques of light and shadow, which are essential components of any artwork. Furthermore, the statistics reveal impressive progress in the participants' ability to apply these principles effectively, resulting in a remarkable advancement in their artistic skills. This positive development is a testament to the participants' dedication and hard work and the effectiveness of their training.

To determine the impact of the Microsoft Bing Image Creator tool on painting performance, the average and standard deviations of students' painting scores were calculated using the Assessment Product Card (items 1-7).

A "t" test was conducted based on the pre-and post-application averages and standard deviations to compare the statistical differences between the averages.

Table (2) Average, standard deviations, and “ t ”test for the effect of implementing Microsoft Bing Image Creator tool on students 'painting performance.

Student's painting performance	Student number	Average	standard deviation	"t" value	Degrees of freedom	Statistical significance
Before using the tool	14	2.21	.628	- 9.906	13	.000
After using the tool	14	2.84	.510			

Based on the findings presented in Table 2, it is evident that there are significant differences (at the alpha level of 0.05) in students' painting performance before and after using Microsoft Bing Image Creator. The results show a clear improvement in the post-measurement, indicating that the

use of Microsoft Bing Image Creator positively impacts students' painting performance. In summary, the findings suggest that Microsoft Bing Image Creator can effectively enhance students' painting skills.

The results presented in Table 2 are consistent with and confirm the findings of two previous studies conducted by Alhomaiddi and Salleh (2022) regarding the significance of incorporating new teaching strategies while teaching arts and Allmnakrah, A. & Evers, C. (2020) in terms of encouraging students to express emotions and concepts through their artistic pursuits. The results markedly improved students' creative performance after implementing the Microsoft Image Creator AI tool.

This study's findings align with this trend, as they exhibit a significant difference in students' painting performance before and after utilizing Microsoft Bing Image Creator, with a clear improvement observed in the post-measurement. The consistency among the studies strongly underscores the idea that technological aids, such as Microsoft Bing Image Creator, play an important role in enhancing students' painting abilities, confirming the consensus that technological interventions effectively boost artistic skills among students.

Question 2: To what extent does Microsoft Bing Image Creator affect students' creative ideas in painting?

To measure the creativity in students' painting ideas, three items in the product card were used before and after the application of the Microsoft Image Creator tool. The items were derived based on the standards associated with the curriculum. Two experts judged the product tool: one has 24 years of experience teaching abstract arts, and the other has a Ph.D. in curricula and teaching strategies.

The results of evaluating students' creative ideas in paintings based on the product card are shown in Table (3) as follows:

Table (3) Students' painting creative ideas results before and after implementing Microsoft Bing Image Creator

Standard	Item	Average Before	Average After
Cr1	Development of unique ideas and concepts	1.29	2.21
Cr2	Incorporation of personal style into artwork	2.07	2.86
Cr3	Use of color and composition to enhance work	1.71	2.86

The data indicates a considerable improvement in several critical aspects of creativity. The results demonstrate a significant progression in the participants' creativity, particularly in their creative imagination and the incorporation of their unique style into their artwork. The average score for developing unique ideas and concepts increased impressively from 1.29 before to 2.21 after, indicating a remarkable 0.92-point elevation in this domain. Additionally, incorporating personal style into artwork markedly improved, rising from an average of 2.07 to 2.86, reflecting a commendable 0.79-point increase.

Moreover, using color and composition to enhance the artwork showed a significant leap, with scores escalating from 1.71 to 2.86, showcasing a substantial 1.15-point gain. These results highlight a considerable enhancement in the participants' abilities to generate unique concepts, infuse their style, and effectively utilize color and composition to enrich their artistic endeavors. Overall, the results indicate a notable growth in key creative competencies among the participants.

To answer a question, To what extent does Microsoft Bing Image Creator affect students' creative ideas in painting? The averages and standard deviations of items 8-10 in the product card were calculated to evaluate the overall creative ideas presented by students. A "t" test was calculated to determine the impact of the Microsoft Bing Image Creator tool when comparing the average and standard deviation before and after its implementation to demonstrate statistical differences between the averages.

Table (4) Average, standard deviations, and“ t ”test for the effect of implementing the Microsoft Bing Image Creator tool on students 'creativity level.

Student's creativity level	Student number	Average	standard deviation	"t" value	Degrees of freedom	Statistical significance
Before using the tool	14	1.69	.443	- 10.41	13	.000
After using the tool	14	2.64	.380			

Based on Table 4, it is evident that there are statistically significant differences at the significance level $\alpha = 0.05$, which can be attributed to the effect of utilizing Microsoft Bing Image Creator on the creativity level of students, as per the pre-and post-measurements. The differences were found to favor the post-measurement after the students utilized Microsoft Bing Image Creator, which enhanced their creativity level.

The data presented in Table 4 are aligned with the results of two previous studies by Al-Ghamdi (2019) and Al Dabbagh (2020), highlighting the importance of fostering creativity in students' artistic development. Al-Ghamdi's research emphasizes the significance of encouraging creativity

through hands-on exploration of diverse painting techniques and materials, similar to this study's approach.

Similarly, Al Dabbagh focuses on promoting creativity, originality of ideas, and conceptual understanding, which closely aligns with the objectives assessed in the current research. The results of this study support this trend. These differences were attributed to using Microsoft Bing Image Creator, which notably enhanced students' creativity levels, as observed in the pre-and post-measurements.

Question 3: What are students' attitudes toward using Microsoft Bing Image Creator in the art classroom?

To answer this question, averages and standard deviations were calculated for students' attitudes toward using AI tools in Microsoft Bing Image Creator In art class, as shown in Table 5.

Table 5 Averages and standard deviations of students' attitudes toward using a program Microsoft Bing Image Creator In the arts class, they are arranged in descending order according to their arithmetic averages

Rank	Item #	Item	Average	S.D	Indication level
1	6	I think using the Bing Image Creator meets my expectations in painting lessons.	4.80	.426	high
2	7	I took a well-trained on using Microsoft Bing Image Creator in my painting lessons	4.79	.425	high
3	3	I think using the Bing Image Creator enhances my engagement in painting lessons.	4.57	.514	high
4	4	I think using the Bing Image Creator increases my comprehension of the painting concepts.	4.43	.756	high
4	11	Microsoft Bing Image Creator is hard- to-use in painting lessons.	4.43	.514	high

6	2	I think using Bing Image Creator does not develop my ideas/skills in painting.	4.36	.745	high
6	5	I think using the Bing Image Creator stimulates my creativity during painting lessons	4.36	.497	high
6	9	I found difficulties while using the Microsoft Bing Image Creator tool in terms of browsing tools.	4.36	.745	high
6	12	I need more training to use Microsoft Bing Image Creator in my painting lessons.	4.36	.633	high
10	10	I'm disappointed in terms of the quality of paintings generated while using the Microsoft Bing Image Creator tool.	4.21	.699	high
11	1	I think Bing Image Creator has an easy-to-approach interface and easy-to-use tools.	4.14	.864	high
12	8	I agree that Microsoft Bing Image Creator should be incorporated into future painting lessons	4.00	.784	high
The scale as a whole			4.40	.352	high

The study tools were corrected using a five-point Likert scale. Each paragraph was given a score out of five degrees, corresponding to strongly agree, agree, neutral, disagree, and strongly disagree, respectively. These degrees were represented numerically by 5, 4, 3, 2, and 1. Items 1 to 8 had a positive trend, while items 9 to 12 had a negative trend. The responses were reversed to correct the standard for the negative items, so the score for each paragraph was 1, 2, 3, 4, and 5, respectively. The results were analyzed using the following scale:

- 1.00 to 2.33 was considered a low indication

- 2.34 to 3.67 was a medium indication

- 3.68 to 5.00 was a high indication

The following equation was used to calculate the measure: (the upper limit of the scale - the lower limit of the scale) divided by the number of categories required, which was 3. This gave a value of 1.33. Finally, 1.33 was added to the lower limit of each class indicator to determine the final score.

According to Table (3), the students' average rating for the Bing Image Creator tool in painting lessons ranged between 4.00 and 4.80. Item No. (6) received the highest rating of 4.80, stating, "I think using the Bing Image Creator meets my expectations in painting lessons." On the other hand, Item No. (8) received the lowest rating of 4.00, with the statement, "I agree that Microsoft Bing Image Creator should be incorporated into future painting lessons." Despite the lower rating, it still received a "high" indication level. The overall scale average was 4.40, at a "high" indication level. These results indicate that the students had a positive attitude towards the Bing Image Creator tool in painting lessons.

The results in Table 5 align with the findings of three previous studies on using AI tools in education. Beyan and Rossy's research (2023) and Al Dabbagh, 2020 emphasized the essential role of Generative AI tools, similar to the Microsoft Bing Image Creator used in this study. These studies demonstrated the ability of AI tools to enhance students' learning experiences. Also, Cooper's study (2023) highlighted the motivational effect of AI on students, which is evident in this study's positive feedback regarding the Bing Image Creator tool.

In contrast, Baidoo and Ansah's research (2023) expressed concerns about the reliability of AI tools for painting. However, the results of the present study contradict their perspective. The student ratings for the Bing Image Creator tool in painting lessons ranged from 4.00 to 4.80, with paragraph 6 receiving the highest rating of 4.80. These results indicate that using the Bing Image Creator tool met students' expectations in painting lessons. Even though paragraph 8 received the lowest rating of 4.00, it still shows a "high" level of agreement, suggesting a willingness to incorporate Microsoft Bing Image Creator into future painting lessons.

The overall scale average of 4.40 at a "high" level of agreement shows that students had a positive attitude toward the Bing Image Creator tool. These results corroborate the positive impact of AI tools in improving educational experiences, motivation, and creative exploration, as previously highlighted in other studies.

Conclusion

The study investigated the effect of Microsoft Bing Image Creator on students' painting performance, creativity, and attitudes in the art classroom. A comprehensive methodology was employed, which included pre- and post-measurement assessments, statistical analysis, and student evaluations. The sample consisted of students in an art classroom setting randomly assigned to either a control or experimental group to gauge the tool's effectiveness.

The results demonstrated that Microsoft Bing Image Creator significantly impacts students' painting skills. The post-measurement averages in painting performance showed considerable improvement compared to pre-application measures, indicating that the tool positively influences students' painting abilities. Additionally, the evaluation of students' creative ideas in painting showed a marked improvement, signifying that the Bing Image Creator tool effectively nurtures innovative and imaginative approaches within the painting context.

Statistical analysis showed the tool was highly effective in enhancing students' creativity levels post-utilization. The findings support the tool's efficacy in fostering imaginative thinking within the context of painting lessons. Furthermore, evaluating students' attitudes towards the Bing Image Creator tool revealed overwhelmingly positive sentiments. Most students expressed favorable opinions, highlighting the tool's ability to meet expectations, enhance engagement, and contribute to comprehension and creativity in painting lessons.

The study identified minor concerns regarding the usability and quality of the tool, which did not overshadow the overall positive perception of the Bing Image Creator. Opportunities for further development and improvement of the device can be found within these concerns, which will help meet the requirements of both students and teachers.

In conclusion, the study's results endorse the beneficial impact of Microsoft Bing Image Creator on students' painting endeavors. The findings unequivocally support the tool's effectiveness in augmenting painting performance, nurturing creative ideas, and eliciting positive attitudes among students within the art classroom setting. Based on the robust evidence gathered in this study, continued integration, and utilization of the Bing Image Creator tool in future painting lessons appears justified and promising.

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