

THE ADAPTATION OF ARTIFICIAL INTELLIGENT TOOLS IN TEACHING AND LEARNING ART IN TERTIARY EDUCATION IN RIVERS STATE

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Abstract

The integration of Artificial Intelligence (AI) into the art education curriculum has gained significant attention for its ability to enhance creativity, streamline administrative tasks, provide personalised learning experiences, and address the changing demands of the digital era. The study aims to integrate artificial intelligence into teaching and promote art in tertiary education in Rivers State. Specifically identify the tools used and ascertain their impact on students' teaching approaches and learning outcomes. The study adopted qualitative research methods to provide deep insight into this phenomenon by capturing rich descriptive details. Constructivism was the theoretical frame adopted, which prescribes students' active participation in constructing knowledge. In the context of AI and art education, students can use artificial intelligence tools (technologies) to create, explore and experiment with different artistic techniques and styles. Findings of this study indicate that artificial intelligence enhances art education by providing personalised feedback, generating new styles and techniques for students' exploration, and facilitating collaboration on projects and the sharing of ideas. Artificial intelligence also allows teachers to track students' progress and identify areas where they can provide intervention when needed. The study recommended that art educators/educationists should see artificial intelligence as a partner in progress and therefore

adopt artificial intelligence tools for performance enhancement.

Keywords: Adaptation, AI Tools, Teaching and Learning, Ads Education, Tertiary Institution

Introduction

Art education has long been a cornerstone of human creativity and expression, providing individuals with tools and techniques to explore their artistic abilities. However with the rapid advancements in technology, particularly in the field of artificial intelligence (AI), the landscape of art education is undergoing a transformation, (Johnson, 2020). According to Smith (2019), AI has the potential to revolutionise the way art is taught and learned, offering new opportunities for creativity and innovation. From virtual reality tools that allow students to explore different artistic mediums to machine learning algorithms that can analyze and critique artwork, AI is reshaping the way we approach art education. One example of this is the use of AI in art history education, where algorithms can analyze and categorize art works, providing students with a deeper understanding of artistic movements and styles. AI also can be used to create personalized learning experience, tailoring lessons to individual students' needs and preferences. In this digital age, the integration of AI into art education is evolving offering new possibilities for both students and educators (Johnson, 2020). @ embracing these technological advancements, we can unlock the full potential of human creativity and expression in the realm of art. Artificial intelligence (AI) has been making significant strides in various industries, including education in recent years, AI has been increasingly integrated into educational settings to enhance learning experiences and improve outcomes for students (Smith, 2019). AI tools have the ability to personalize learning, provide instant feedback, and support teachers in delivering more effective instruction. As technology continues to advance, the role of AI in education is only accepted to grow.

Art education in Rivers State is an important aspect of the curriculum, with a focus on developing creativity, critical thinking, and problem-solving skills in students. Rivers State is home to numerous art schools, galleries, and cultural institutions that support the growth and development of

artists and art educators. Rivers State is located in Southern Nigeria and has a rich cultural heritage and a vibrant art scene. As the world becomes increasingly digitalized and interconnected, it is important for educators to adapt the teaching methods that meet the needs of 21st century learners, integrating AI tools into art education can provide students with new opportunities to explore and create art in innovative ways. AI can help students develop their artistic skills, provide personalized feedback on their work, and expose them to new techniques and styles, (Johnson, 2020). @ incorporating AI into art education, educators can enhance the learning experience of students and prepare them successfully in a rapidly changing world.

Statement of the Problem

Although artificial intelligence has the potential to enhance art education, there are also challenges and concerns associated with the use of artificial intelligence tools in the classroom. One of the main concerns is the potential for artificial intelligence to replace human teachers. Some educators worry that AI tools may not be able to provide the same level of support and guidance as a human teacher. There is also concern that artificial intelligence tools may not understand the nuances of art and creativity, leading to a one-size-fits-all approach to teaching and learning. A significant problem is the issue of bias in artificial intelligence algorithms. AI tools are only as good as the data they are trained on, and if the data is biased, the AI may produce biased results. This is especially relevant in art education, where diversity and inclusion are important considerations. Educators must be mindful of the potential for bias in AI tools and work to mitigate these risks. The issues discussed above motivate the study on the adaptation of AI tools in teaching and learning of art in tertiary education in Rivers State.

Aim and Objectives of the Study

The study aims at integrating artificial intelligence into teaching and promoting art in tertiary education in Rivas State. Specifically, the objectives of the study were to.

1. Examine the current state of art education in Rivers State and identify AI tools that are used to enhance the learning experience
2. Ascertain their impact on teaching approaches and learning outcomes of the student

3. Explore the aptitudes and perceptions of art educators in Rivers State towards the integration of AI tools in their teaching practices.
4. Proffer solutions on AI tools implementation in art education in Rivers State and provide guidance for educators seeking to incorporate AI into their job.

Theoretical Framework

Two theories were adopted for this study. Constructivism and the theory of AI and Art Ed Education.

One theoretical framework for integrating AI into art education is through the lens of constructivism. Constructivism posits that learning is an active process in which individuals construct their own understanding and knowledge of the world through experiences and interactions. In the context of AI and art education, students are encouraged to use AI tools to create, explore, and experiment with different artistic techniques and styles. By engaging with AI, students can develop their creativity, critical thinking, and problem-solving skills as they navigate the possibilities and limitations of these technologies. Again, AI can serve as a tool for personalised learning, allowing students to receive feedback and guidance tailored to their individual needs and preferences. This can help students develop their artistic skills and confidence in a supportive and adaptive learning environment.

However, integrating AI into art education can improve the learning experience by offering students new opportunities for exploration, collaboration, and self-expression. It can also help students gain a deeper understanding of the link between art, technology, and society, preparing them for the challenges and opportunities of the digital age. The theory of AI and art education suggests that artificial intelligence can serve as a tool to enhance and enrich the teaching and learning of art. This theory was proposed in the early 21st century by advocates such as Ahmed Elgammal, a computer scientist and artist, and Aaron Hertzmann, a researcher in computer graphics and artificial intelligence. According to this theory, AI can be used to analyse and interpret artworks, provide personalised

feedback to students, generate new artistic ideas, and even create art itself. By integrating AI into art education, students can develop a richer understanding of artistic concepts, boost their creativity, and explore new possibilities in their artistic practice. The theory of AI and art education underlines the potential of technology to revolutionise the way art is taught and learned, creating new opportunities for both students and educators in the field of art.

Artificial Intelligence

Artificial intelligence (AI) is a rapidly developing field that focuses on creating computer systems capable of performing tasks usually requiring human intelligence, such as visual perception, speech recognition, decision-making, and language translation. The goal of AI is to develop machines that can think, reason, and act like humans, ultimately improving efficiency, accuracy, and productivity across various industries (Krizhevsky, Sutsver, Hinton, 2012). The concept of AI dates back to the 1950s, when computer scientists began exploring the idea of creating machines that could mimic human intelligence. One of the earliest breakthroughs in AI was the development of perception, a type of artificial neural network capable of learning to recognise patterns in data. This work, led by Frank Rosenblatt in 1957, laid the foundation for modern machine learning algorithms used in AI systems today. AI research has continued to progress with significant milestones such as the development of expert systems in the 1970s and the introduction of deep learning techniques in the 2000s. Expert systems are AI programmes that utilise rules and logic to simulate human decision-making in specialised fields, such as medical diagnosis or financial analysis. Deep learning, on the other hand, involves training artificial neural networks with large amounts of data to recognise complex patterns and make predictions.

Recent advancements according to Krizhevsky, Sutsver B Hinton (2012) in AI are driven by the availability of big data, powerful imputing resources, and breakthroughs in machine learning algorithms. In 2012, researchers at Google developed a deep learning algorithm called AlexNet that significantly improved the accuracy of image recognition tasks. This breakthrough paved the way for the widespread adoption of deep learning in various applications, such as autonomous vehicles, natural language processing, and healthcare. One of the most notable applications of AI is in

the field of autonomous vehicles, where AI systems are used to navigate and make decisions in real-time. Thus, it has the potential to transform industries, improve efficiency, and enhance human capabilities in ways that were previously unimaginable. As AI technology continues to advance, it is important for researchers, policymakers, and captains of industry to consider the ethical implications of AI, such as in algorithms, data privacy, and job displacement.

Art Education

This study explores the importance of art education in schools, the benefits it offers to students, and the challenges that educators encounter in implementing effective art programmes. Art education plays a vital role in fostering creativity and innovation in students. By engaging in artistic activities such as drawing, painting, sculpture, etc., students are able to explore their imaginations and express themselves in unique ways. This creative process helps students develop problem-solving skills and think outside the box, which are essential skills for success in the 21st century. Art education helps students develop critical thinking skills by encouraging them to analyse and interpret visual information. By studying works of art from different cultures and periods, students learn to think critically about the meaning and significance of art. This ability to analyse and interpret visual information is a valuable skill that can be applied to other areas of study. Therefore, art education is a crucial component of a well-rounded education that helps students develop creativity, critical thinking skills, and cultural awareness.

Despite the many benefits of art education, there are challenges that educators face in implementing effective art programmes in schools. One of these challenges is the lack of funding and resources for art teaching. Many schools have had to cut back on art programmes due to budget constraints, leaving students with limited opportunities to engage in artistic activities. This lack of access to art education disproportionately affects students from low-income backgrounds, who may not have the means to pursue art outside of school. Another challenge is the pressure to focus on standardised testing and academic achievement, which can lead to a neglect of the arts in schools. In the education system that prioritises test scores and academic performance, art education is often seen as a luxury rather than a necessity. This narrow focus on academic achievement

can limit students' opportunities to develop creativity, critical thinking skills, and cultural awareness through art education. Despite these challenges, it is essential that educators continue to advocate for the importance of art education in school. Educators can help students develop the skills and perspectives they need to thrive in an increasingly diverse and complex world by providing them with opportunities.

Art Education and Artificial Intelligence

Art education and artificial intelligence have a complex and evolving relationship. As technology continues to advance, it is increasingly being integrated into various aspects of art education, from creating new tools for artists to enhancing the learning experience for students.

One example of this is the use of AI in creating art. In recent years, AI algorithms that were developed can generate original artworks; for instance, "Portrait of Edmond de Belamy" created by the AI program Generative Adversarial Network (GAN) in 2018 raised questions about the role of AI in the creative process and its impact on traditional notions of artistry (Elgammal, Liu, Ehoesiny, B Mazzone, 2017). On the other hand, AI is also used to enhance art education by providing new tools and resources for students and teachers. For example, AI-powered platforms like Artivive, Google Arts & Culture offer interactive experiences and educational content that assist students in learning about art history, techniques, and sales in a more engaging and immersive way (Google Arts & Culture, 2018).

The Role of Artificial Intelligence in Art Education

Art education plays a crucial role in fostering creativity, critical thinking, and problem-solving skills in students. With the advancement of artificial intelligence (AI), this technology has started to make its way into the field of art education, offering new opportunities for both teachers and students. AI tools can enhance the teaching and learning experience by providing personalised feedback, generating new ideas, and facilitating collaboration among students. This study explores the benefits of AI integration in teaching and learning of art, as well as the challenges and concerns associated with AI tools in art education. It also reviews previous studies and research conducted in this area to understand the impact of AI on art education.

Benefits of AI Integration in Teaching and Learning Art

Integrating AI into the teaching and learning of art can enhance the learning experience for students, improve their skills and creativity, and make art education more accessible and engaging for all learners. This can be seen through.

1. **Personalised learning.** AI can analyse students' learning patterns and preferences to create personalised learning experiences. This can help students learn at their own pace and in a way that suits their individual needs, leading to better understanding and retention of information.
3. **Enhanced creativity.** AI can provide students with tools and resources to explore their creativity in new and innovative ways. For example, AI-powered software can generate new ideas, suggest improvements, and provide feedback on students' artwork, helping them to develop their artistic skills and express themselves more effectively.
4. **Improved accessibility.** AI can help make art education more accessible to students with disabilities or those who may face barriers to traditional learning methods. For example, AI-powered tools can provide audio descriptions of visual artworks for visually impaired students or offer alternative ways for students with physical disabilities to create art.
5. **Real-time feedback.** AI can provide instant feedback to students on their artwork, helping them identify areas for improvement and make adjustments in real time. This can help students to develop their skills more quickly and effectively, and build their confidence in their artistic abilities.
5. **Increased engagement.** AI can make learning art more engaging and interactive for students by providing immersive experiences such as virtual reality art galleries, interactive tutorials, and gamified learning activities. This can help to keep students motivated and interested in their studies, leading to better outcomes.

Challenges and Concerns Associated with AI Tools in Art Education

The following are some of the challenges and concerns associated with AI tools in art education

1. Lack of human touch. One of the main concerns with using AI tools in art education is the potential loss of the human touch and personal connection that comes with traditional teaching methods. AI tools may not be able to provide the same level of emotional support, encouragement, and feedback that a human teacher can.
2. Limited creativity. AI tools may face restrictions in fostering creativity and originality in students. While they can offer guidance and suggestions, they might not be able to inspire students to think innovatively and explore new ideas in the same way a human teacher can.
3. Bias and lack of diversity. AI tools are only as good as the data they are trained on, which can lead to biases and a lack of diversity in the content and feedback they provide. This can be particularly problematic in art education, where diversity and representation are important factors in fostering creativity and inclusion.
4. Technical issues. AI tools may be prone to technical problems and glitches that can disrupt the learning process and frustrate students and teachers. This can be especially challenging in a practical subject like art, where students depend on technology to create and display their work.
5. Privacy and data security. AI tools in art education may collect and store sensitive data about students, such as their artwork, preferences, and learning progress. Ensuring the privacy and security of this data is crucial to protect students' personal information and prevent it from being misused or exploited.
6. Cost and accessibility. Implementing AI tools in art education can be expensive, making them inaccessible to schools and students with limited resources. This can widen the digital divide and create disparities in access to technology and educational opportunities.
7. Ethical considerations. There are ethical considerations to take into account when using AI tools in art education, such as ensuring transparency in how the technology is used and making sure it aligns with ethical standards and values. Teachers and students must be aware of the potential ethical implications of using AI tools and be prepared to address them in a responsible manner

Integration of AI in Art Education in Rivers State.

Identification and examination of existing AI tools used in art education in tertiary institutions in Rivers State. Currently, there is limited integration of AI tools in art education within these institutions in Rivers State. Some of the existing AI tools being utilised include Virtual Reality (VR) and Augmented Reality (AR) applications for creating immersive art experiences, AI-powered software for digital art creation, and machine learning algorithms for analysing and interpreting art data. There is a growing interest in developing artificial intelligence (AI) tools across various fields, including education. In the context of art education in tertiary institutions, AI tools have been created to support both educators and students in different aspects of teaching and learning.

Existing AI Tools Used in Art Education

Some of the existing tools used in art education include.

1. Virtual reality (VR) and augmented reality (AR) applications. These tools allow students to immerse themselves in virtual art galleries, explore different artistic styles, and even create their own artworks in a digital environment.
2. Machine learning algorithms. These algorithms can analyse students' artwork and provide personalised feedback on their strengths and areas for improvement. They can also recommend resources and exercises to help students enhance their skills. Chatbots and virtual assistants. These tools can offer students immediate support and guidance on art-related topics, such as art history, techniques, and materials. They can also assist educators in managing administrative tasks and communicating with students more efficiently.
3. Online platforms and learning management systems. These platforms use AI to personalise the learning experience for each student, track their progress, and recommend relevant resources and activities. They also enable educators to create interactive lessons, assessments, and collaborative projects.

The use of AI tools in art education has the potential to revolutionise teaching approaches and enhance student learning outcomes in several ways.

1. Enhanced creativity and critical thinking. AI tools can stimulate students' creativity by exposing them to a wide range of artistic styles, techniques, and perspectives. They can also encourage students to think critically about their own artwork and the work of others, fostering a deeper understanding of art concepts and principles.
2. Enhanced feedback and assessment. AI tools can objectively analyse students' artwork, identifying patterns, trends, and areas for improvement that may not be apparent to human educators. This data-driven feedback can assist students in setting realistic goals, monitoring their progress, and making informed decisions about their artistic development.
3. Increased accessibility and inclusivity. AI tools can offer students with disabilities or diverse learning needs alternative ways to engage with art education, such as audio descriptions, tactile feedback, and interactive simulations. They can also assist students who speak different languages or come from different cultural backgrounds, making art education more inclusive and equitable.
4. Personalised learning. AI tools can adapt to each student's learning style, pace, and preferences, providing them with customised feedback, resources, and challenges. This personalised approach can help students stay engaged, motivated, and focused on their learning goals.

However, the effectiveness of AI tools in art education depends on how they are integrated into the curriculum, how they are used by educators and students, and how they are evaluated. and improved over time. By leveraging AI, tertiary institutions can enhance the teaching and learning experience in art education, preparing students for success in the digital age.

Generally, an analysis of the effectiveness of AI tools in improving teaching approaches and student learning outcomes shows that, in art education, their use has yielded promising results. AI-powered software can provide personalised feedback to students, analyse their work for areas needing improvement, and offer suggestions for creative development. Additionally, VR and AR applications can create interactive, engaging

learning experiences for students, leading to increased motivation and improved knowledge retention.

Evaluation of AI Adoption and Practices among Educators and Students in the Region

While there is a growing interest in integrating AI tools in art education, the level of adoption and acceptance among educators and students in Rivers State remains relatively low. Educators may be hesitant to incorporate AI into their teaching practices due to a lack of training and resources for implementation, as well as concerns about AI's impact on traditional art practices. Students, on the other hand, may be more open to using AI tools but may require additional support and guidance from educators.

Barriers and Challenges of Integrating AI in Art Education

There are several barriers and challenges that hinder the integration of AI into art education in Rivers State. These include limited access to AI tools and resources, a lack of training and professional development opportunities for educators, resistance to change from traditional teaching methods, and concerns about the ethical implications of AI in the creative process. Also, there may be cultural and institutional barriers that prevent the widespread adoption of AI in art education.

Therefore, while there is potential for AI to enhance art education in Rivers State, there are still significant challenges that need to be addressed in order to fully integrate AI tools into teaching practices and improve student learning outcomes. Collaboration between educators, students, policymakers, and industry stakeholders will be essential in overcoming these barriers and promoting the effective use of AI in art education.

Conclusion

One of the main benefits of AI integration in art education is the ability to provide personalised feedback to students. AI tools can analyse students' work and suggest improvements based on their individual strengths and weaknesses. This can help students develop their skills more effectively and efficiently. AI can also generate new ideas and inspiration for students by analysing a vast amount of art history and contemporary art. This can help students explore new styles and techniques that they may not have

considered before. Another benefit of AI integration in art education is the ability to facilitate collaboration among students. AI tools can connect students with similar interests and skills, allowing them to work together on projects and share ideas, which encourages students to learn from each other and develop a sense of community within the classroom. However, AI can also help teachers track students' progress and identify areas where they may need further support. This will enable teachers to provide targeted interventions to help students succeed in their endeavours.

Recommendation

The study recommended that art educators/educationists should see artificial intelligence as a partner in progress, therefore adopt the artificial intelligence tools for performance enhancement.

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