

## IMPACT OF EDUCREATION AND PIKTOCHART ON ACHIEVEMENT AND RETENTION AMONG GEOGRAPHY STUDENTS IN SECONDARY SCHOOLS IN SHIRORO, NIGER STATE, NIGERIA: A COMPREHENSIVE REVIEW

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### Abstract

*This review investigates the impact of digital tools Educreation and Piktochart on student achievement and retention among secondary school geography students in Shiroro, Niger State, Nigeria. As education increasingly incorporates technology, visual learning tools have emerged as significant assets in enhancing educational outcomes. Educreation, an interactive learning platform, and Piktochart, a user-friendly infographic creator, both facilitate visual learning, making complex geographical concepts more accessible and engaging for students. This review synthesizes existing research on the effectiveness of these tools, highlighting their roles in improving academic performance and information retention. Research findings indicate that Educreation promotes active engagement through multimedia resources, enhancing students' understanding and retention of geographical knowledge. Similarly, Piktochart aids in the simplification of information through visually appealing infographics, contributing to improved academic achievement. However, challenges remain regarding the integration of these tools into existing curricula and the need for adequate teacher training and technology access. The review emphasizes the importance of further research within the Nigerian context to explore the long-term benefits and challenges of using these digital tools. Practical recommendations for educators and policymakers are provided to enhance the effective implementation of Educreation and Piktochart in geography education, ultimately fostering better learning outcomes for students. By leveraging these innovative tools, educators can create a more dynamic and effective learning environment that supports students' academic success and retention.*

**Keyword:** Educreation, Piktochart, Visual Learning, Geography Education, Student Achievement, and Retention

### Introduction

In the rapidly evolving landscape of education, digital tools have emerged as key resources in enhancing student engagement, comprehension, and retention across various subjects. In the field of geography education, where visual representations of spatial data are paramount, tools like Educreation and Piktochart have gained prominence. Educreation is an interactive platform that allows educators to create dynamic lessons incorporating multimedia, audio, and video to explain geographic concepts (Parveen & Husain, 2021). Piktochart, on the other hand, is a visual communication tool that simplifies complex data through infographics, maps, and charts, making it particularly effective in geography where visual data is essential for understanding patterns and trends (Chia *et al.*, 2023). Both tools provide innovative ways to transform traditional geography lessons into interactive learning experiences, enabling students to visualize and interact with geographic data in more meaningful ways.

The integration of digital tools like Educreation and Piktochart in secondary school geography education is aligned with modern pedagogical trends that emphasize the importance of active

learning and student-centered approaches. Traditional geography instruction often relies on textbook-based learning and static maps, which can limit students' engagement and understanding of abstract spatial concepts (Latif, 2024). However, by incorporating interactive and visual tools, students are able to see real-time demonstrations of geographic phenomena, engage in self-paced learning, and create their own visual representations of data, thus enhancing their grasp of complex topics such as climate change, population distribution, and landform development.

Academic achievement and retention are critical indicators of student success in any educational context. Achievement refers to the measurable performance outcomes of students, often assessed through standardized tests, quizzes, and class activities (Chia *et al.*, 2023). In the context of geography education, achievement can be seen in students' ability to analyze spatial data, apply geographic theories, and demonstrate knowledge of environmental systems.

**Retention**, on the other hand, refers to a student's ability to retain and recall information over time, which is crucial in subjects like geography where foundational knowledge is built upon cumulatively throughout the curriculum (Davis, 2022). The goal of using digital tools like Educreation and Piktochart is not only to enhance students' short-term achievement but also to improve their long-term retention of geographic concepts by providing them with engaging, interactive, and visually supported learning experiences.

The purpose of this review is to synthesize existing research on the impact of Educreation and Piktochart on students' achievement and retention in secondary school geography classes, with a specific focus on schools in Shiroro, Niger State, Nigeria. Numerous studies have examined the role of technology in education, but there is limited literature that focuses specifically on the impact of visual learning tools in geography education, particularly in resource-constrained settings like Shiroro. By analyzing existing studies, this review aims to provide a comprehensive understanding of how these tools affect geography students' performance and retention, highlighting both the opportunities and challenges associated with their implementation in Nigerian secondary schools (Aungst, 2023).

### **Theoretical Frameworks Supporting Visual Learning** **Cognitive Theory of Multimedia Learning (CTML)**

Mayer's **Cognitive Theory of Multimedia Learning (CTML)** provides a foundational understanding of how multimedia, including tools like Educreation and Piktochart, enhances learning outcomes by reducing cognitive load and improving retention. According to Tucker (2023), CTML is built on the premise that people learn more effectively when presented with both verbal and visual materials, as these align with the brain's dual-channel processing system. Mayer posits that humans have separate channels for processing verbal and visual information, and effective learning occurs when these channels are used optimally to avoid cognitive overload. The use of multimedia tools like Educreation supports this theory by integrating audio, text, and imagery to present geographic content in ways that engage both channels, thus maximizing understanding and retention. For instance, a geography lesson using Educreation might incorporate a narrated explanation alongside animated maps or images, helping students visualize abstract concepts such as tectonic plate movement or erosion processes.

### **Dual-Coding Theory**

Complementary to CTML is Paivio's Dual-Coding Theory (DCT), which further supports the idea that learning is enhanced when information is processed through both verbal and visual channels. Paivio argued that the brain stores and processes information in two distinct but

interconnected systems: a verbal system for linguistic information and a non-verbal system for visual information. According to DCT, when learners are exposed to both verbal and visual stimuli simultaneously, the two systems work together to create richer cognitive connections, making it easier to recall and apply the learned information (Ahmad *et al.*, 2022). In geography education, tools like Piktochart facilitate dual coding by enabling students to create and interpret infographics, maps, and charts that visually represent geographic data, while also providing verbal explanations of these visuals.

Both CTML and DCT emphasize the importance of managing cognitive load in educational settings, particularly when dealing with complex or abstract concepts. In geography, students are often required to understand multi-dimensional data, such as population distribution, landforms, or climate patterns, which can be cognitively demanding. Tools like Educreation and Piktochart help to reduce cognitive load by presenting information in a structured and visually supported manner, allowing students to process it more easily. Mayer's CTML, in particular, highlights the concept of extraneous cognitive load, which occurs when information is presented in a way that is confusing or overwhelming (Mitayo & Nakanitanon, 2021). By using multimedia tools that streamline information presentation, educators can minimize extraneous load, allowing students to focus more on essential learning processes.

In summary, both Mayer's Cognitive Theory of Multimedia Learning and Paivio's Dual-Coding Theory provide strong theoretical support for the use of digital tools like Educreation and Piktochart in geography education. These frameworks explain how multimedia and visual learning reduce cognitive load, enhance understanding, and improve both achievement and retention.

### **Impact of Educreation on Geography Learning**

Educreation is an interactive digital whiteboard platform designed to enhance learning by integrating multimedia into classroom teaching. The platform allows educators to create visually dynamic lessons using a combination of text, audio, and visuals, which can be accessed by students both during and after class. Educreation is particularly useful in subjects like geography, where spatial understanding and visual representations are crucial for learning complex concepts such as landforms, climate systems, and human-environment interactions. By utilizing Educreation, teachers can create interactive maps, animations, and charts that help students visualize geographic processes in real-time. The platform's recording feature also enables teachers to provide voice-over explanations while they manipulate visual elements, offering students a more immersive learning experience. This feature is particularly effective in reinforcing the link between geographic theories and real-world applications (Bicen & Beheshti, 2021).

The interactive nature of Educreation makes it a valuable tool for promoting student engagement, as it enables learners to actively participate in lessons by interacting with the whiteboard, asking questions, and accessing recorded sessions for review. Geography, being a subject that relies heavily on visualization, benefits significantly from the integration of this platform. It supports the development of students' spatial thinking, as they can manipulate maps and diagrams, helping them better understand spatial relationships and geographic patterns. Moreover, the ability to revisit lessons outside the classroom contributes to greater flexibility in learning, allowing students to engage with the material at their own pace (Roehrich & Grabanski, 2023).

### **Research on Educreation and Achievement**

Several studies have explored the impact of Educreation on student achievement, particularly in geography and related fields. A study by Singh *et al.* (2022) found that students who used Educreation in geography classes performed significantly better in their final exams compared to those taught through traditional methods. The study attributed this improvement to the platform's ability to break down complex information into manageable, visually-supported segments, making it easier for students to understand and apply key concepts. Educreation's integration of visual aids, such as animated maps and graphs, was particularly noted for helping students grasp abstract geographic ideas, such as topographical variations and the movement of tectonic plates.

In a similar study Latif (2024) found that Educreation improved students' understanding of both physical and human geography. The study revealed that students who were taught using Educreation scored higher on assessments that required the interpretation of geographic data, such as population distribution maps and climate charts. The researchers noted that the platform's interactive nature encouraged students to actively engage with the material, resulting in better comprehension and higher academic achievement. This is consistent with the broader literature on multimedia learning, which suggests that digital tools that incorporate both visual and auditory elements can enhance students' cognitive processing and improve their overall academic performance (Parveen & Husain, 2021).

### **Research on Educreation and Retention**

Educreation also plays a significant role in enhancing the long-term retention of information, particularly in subjects like geography that rely heavily on visual learning. According to Paivio's Dual-Coding Theory, information is more likely to be retained when it is presented through both visual and verbal channels, as the brain encodes the material in multiple ways, making it easier to retrieve later. Educreation supports this dual-coding process by allowing teachers to present geographic information using a combination of visual aids and spoken explanations. For instance, a lesson on river systems may include a dynamic visual representation of a river's flow, accompanied by an audio explanation of how erosion and deposition occur. This multi-sensory approach helps students form stronger mental connections, leading to better retention of the material (Davis, 2022).

Research on Educreation's impact on retention supports these theoretical claims. In a study conducted by Pettit *et al.* (2023), students who were taught using Educreation showed significantly higher retention rates compared to those taught through traditional lecture methods. The study found that students who had access to Educreation's recorded lessons were able to revisit complex geographic concepts, such as climate change and land use patterns, which contributed to their ability to recall information during exams. The ability to pause, replay, and review lessons at their own pace was highlighted as a key factor in enhancing long-term retention. This suggests that Educreation not only improves immediate academic performance but also supports sustained learning over time.

### **Impact of Piktochart on Geography Learning**

Piktochart is a web-based tool designed to help users create visually appealing infographics, presentations, and reports. The platform is widely used in educational settings to simplify complex information through the use of visual elements such as charts, maps, icons, and images. In geography education, Piktochart plays a critical role in supporting visual learning by enabling students and teachers to present geographic data and concepts in a clear, concise, and engaging manner. The tool allows students to transform raw data into visually enriched

infographics, making abstract geographic concepts more tangible. This is particularly beneficial in geography, where spatial analysis and the presentation of data through maps and charts are central to understanding topics like population growth, resource distribution, and environmental patterns (Aungst, 2023).

Through its user-friendly interface, Piktochart provides an accessible platform for both educators and students to visualize geographic information effectively. Teachers can use the tool to create infographics that summarize geographic theories, while students can employ it to present project work and assignments in visually captivating formats. The ability to customize graphics according to the lesson's needs ensures that Piktochart remains adaptable to various geographic topics, whether it involves the presentation of demographic data or the illustration of geographic phenomena like erosion or climate change (Chia *et al.*, 2023). Thus, Piktochart supports the development of critical thinking and data literacy among geography students, key skills in interpreting and analyzing geographic data.

### **Comparative Impact of Educreation and Piktochart Visual Learning Tools in Comparison**

Educreation and Piktochart, while both digital tools that enhance visual learning, offer distinct educational benefits. Educreation is primarily an interactive whiteboard application that allows teachers and students to create multimedia presentations and tutorials that integrate drawings, audio, and visual elements. This versatility allows for dynamic lesson delivery and real-time interaction in the classroom, supporting immediate feedback and personalized learning experiences (Ahmad *et al.*, 2022). On the other hand, Piktochart is a platform specifically designed for creating infographics, emphasizing the visual presentation of information through charts, icons, and data visualizations. Piktochart excels in organizing complex data into a format that is easy to interpret, making it particularly suitable for summarizing and presenting geographical statistics (Davis, 2022).

In terms of their strengths, Educreation's primary advantage lies in its interactive nature. It enables students to actively engage with the material, making it a suitable tool for collaborative learning and for tasks that require ongoing feedback, such as map drawing and fieldwork annotations (Pettit *et al.*, 2023). Conversely, Piktochart is particularly strong in its ability to simplify and visualize abstract concepts, which aids in the presentation and understanding of spatial data, environmental patterns, and demographic distributions in geography (Parveen & Husain, 2021). However, Educreation may require more technological infrastructure, such as interactive whiteboards, to fully utilize its features, while Piktochart's web-based nature makes it more accessible but less interactive.

### **Effectiveness in Different Learning Scenarios**

Educreation and Piktochart serve different functions in learning, with their effectiveness varying depending on the learning scenario and the students' needs. For visual learners, both tools offer substantial benefits, but Piktochart may provide a more focused and polished method for processing information visually, particularly for summarizing large amounts of data. The tool's ability to integrate charts, icons, and geographical maps enables visual learners to understand concepts such as population density, climate zones, and resource distribution at a glance, which significantly enhances retention (Tucker, 2022). Educreation, with its interactive features, supports both visual and kinesthetic learners by allowing them to engage physically with the learning material. This makes it an ideal tool for students who benefit from tactile engagement, such as those involved in drawing maps or performing simulations of geographic phenomena like erosion or river formation.

Studies show that kinesthetic learners, who learn best through hands-on activities, perform better when using interactive tools like Educreation. The ability to manipulate images, add annotations, and engage in real-time feedback loops with teachers helps to reinforce geographic concepts in a way that passive learning methods cannot (Davis, 2022). However, Piktochart's strength in organizing data and presenting it in a visually attractive format makes it particularly effective for projects and assessments that require summarizing information, such as environmental case studies or demographic analysis, catering well to both visual learners and students who excel in structured learning environments.

### Conclusion and Future Directions

In summarizing the impact of Educreation and Piktochart on student achievement and retention in geography education, it is evident that both digital tools significantly enhance learning outcomes. Educreation facilitates interactive learning experiences through its multimedia features, allowing students to engage actively with geographical concepts, which promotes better retention of information. Similarly, Piktochart's ability to create visually appealing infographics aids in simplifying complex information, making it more accessible to students, thus fostering improved academic performance (Bada & Olabisi, 2020). Overall, both tools have demonstrated their effectiveness in promoting visual learning, suggesting that their integration into geography curricula can lead to higher achievement and better retention among secondary school students in Niger State, Nigeria.

Despite the promising findings, gaps in the literature remain, particularly concerning the implementation of these tools in various educational contexts. Most existing studies focus on broader educational settings without delving deeply into the specific challenges faced in Nigerian secondary schools. Future research should aim to investigate the long-term effects of Educreation and Piktochart on student outcomes across diverse geographical regions within Nigeria, as well as the potential for comparison with other visual learning tools. Additionally, qualitative studies exploring student and teacher experiences with these digital platforms could provide valuable insights into their practical application and effectiveness in enhancing geography education.

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