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USE OF BIG DATA IN PROMOTING MOTIVATIONAL TEACHING METHODS FOR STUDENTS: THE QUEST FOR IMPROVEMENT OF STUDENT PERFORMANCE IN UYO METROPOLIS

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ABSTRACT

This study examined the use of Big Data in promoting motivational teaching methods as a strategic approach to improving pupils' academic performance in contemporary educational settings. In carrying out this study, a descriptive survey design was adopted. The study was conducted in Uyo Metropolis. The target population consisted of all students and teachers in Uyo Metropolis. A simple random sampling technique was employed to select 50 students and 10 teachers from each of the five selected schools in the study area, giving a total sample size of 300 respondents. Data were collected using a structured questionnaire entitled "Big Data and Motivational Teaching Methods Questionnaire" (BDMTMQ). The instrument was validated by an expert in Test, Measurement, and Evaluation to ensure its suitability and clarity. A reliability coefficient of 0.92 was obtained, confirming the reliability of the instrument. Data collected were analyzed using descriptive statistics to answer the research questions. The findings revealed that the most commonly used motivational teaching strategy was Mastery-Oriented Strategies *(17.33%), while* Gamification and Interactive Learning *and* Self-Regulated Learning Strategies *recorded the least percentage (12.67%). The findings further showed that* Personalized Learning Pathways *(27.33%) constituted the most significant role of Big Data in promoting motivational teaching strategies, while* Tailored Professional Development *recorded the least percentage (23.00%). The study concluded that integrating Big Data into teaching not only enhances motivation through personalized and data-driven instructional approaches but also* offering a pathway to more engaging, personalized, and effective learning experiences for pupils. *One of the recommendations made was that* Schools should encourage teachers to integrate big data analytics into lesson planning so that instructional strategies are aligned with pupils' learning patterns, strengths, and weaknesses.

KEYWORDS: Big Data, Motivational Teaching Methods, Quest, Student Performances

INTRODUCTION

The integration of big data into education has reshaped how teachers understand and respond to pupils' learning needs, particularly in fostering motivation and improving academic performance. Big data refers to the large volumes of structured and unstructured educational information generated through digital learning platforms, assessments, and

classroom interactions. When properly analyzed, this data provides deep insights into learners' behaviors, engagement patterns, and academic progress, enabling educators to design more responsive teaching strategies. For instance, learning analytics allows teachers to identify struggling pupils early and adjust instructional approaches accordingly, thereby promoting active engagement and sustained motivation (Wang & Dong, 2024; Zhuoxian, 2024). This data-driven approach moves teaching away from generalized instruction toward a more learner-centered model, where each pupil's unique needs are recognized and addressed.

Furthermore, big data supports the development of motivational teaching methods by enabling personalization and interactive learning experiences. Through continuous data tracking, educators can create adaptive learning environments where instructional content, pace, and difficulty are tailored to individual pupils. Research shows that personalized learning, interactive content, and collaborative activities significantly enhance students' intrinsic motivation and engagement, leading to better retention and academic outcomes (Alj& Bouayad, 2024). Additionally, big data tools allow teachers to construct "learning profiles" for pupils, which inform the use of strategies such as gamification, feedback systems, and differentiated instruction. These approaches not only make learning more enjoyable but also empower pupils to take ownership of their educational journey, thereby strengthening their commitment to academic success (Adeoye, 2024; IJOSSER, 2024).

In the quest to improve student performance, big data also enhances decision-making and instructional effectiveness at both classroom and institutional levels. Predictive analytics models can forecast academic outcomes with high accuracy, enabling early interventions and targeted support for at-risk pupils. Moreover, big data facilitates continuous feedback for teachers, helping them refine their pedagogical practices and adopt innovative, motivation-driven strategies. As highlighted in recent studies, the integration of data-driven insights into teaching not only improves academic achievement but also cultivates a more engaging and supportive learning environment (Meng, 2024; IJET, 2024) . Ultimately, the effective use of big data represents a transformative pathway toward enhancing pupils' motivation and achieving sustained improvements in student performance.

OBJECTIVES OF THE STUDY

The main objective of this study is to examine motivational teaching strategies and the role of Big Data in promoting effective teaching practices. Specifically, the study sought:

1. To find out the types of motivational teaching strategies mostly used in teaching students.
2. To examine the roles of Big Data in promoting motivational teaching strategies.

RESEARCH QUESTIONS

The study was guided by the following research questions:

1. What are the types of motivational teaching strategies mostly used in teaching students?
2. What are the roles of Big Data in promoting motivational teaching strategies?

LITERATURE REVIEW

Concept of Big data

Big Data refers to extremely large, complex, and rapidly growing datasets that cannot be efficiently processed using traditional data management tools. It encompasses not just the size of data but also its diversity and the potential value it can offer for decision-making, predictive modeling, and innovation. With the proliferation of digital technologies, social media, Internet of Things (IoT) devices, and online transactions, data is being generated at unprecedented scales, making Big Data a critical resource in the modern era (Chen et al., 2021).

The key characteristics of Big Data are often summarized by the five Vs: volume, velocity, variety, veracity, and value. Volume refers to the massive amount of data generated from multiple sources, velocity indicates the speed of data generation and processing, and variety highlights the structured, semi-structured, and unstructured nature of data. Veracity deals with the accuracy and reliability of data, while value emphasizes the importance of extracting actionable insights from complex datasets (Hashem et al., 2020). These characteristics distinguish Big Data from traditional datasets and present unique opportunities and challenges for organizations.

Big Data originates from a wide range of sources, including social media platforms, sensor networks, IoT devices, multimedia content, transactional databases, and web clickstreams. Social media platforms such as Twitter and Facebook generate enormous amounts of user-generated content daily, while IoT devices produce continuous streams of sensor data. In addition, organizations collect transactional and operational data that, when analyzed in conjunction with other sources, provide a comprehensive understanding of trends, behaviors, and system efficiencies (Riggins & Wamba, 2021).

The applications of Big Data are vast and span multiple domains. In healthcare, it is used for predictive analytics, disease outbreak monitoring, and personalized medicine. Businesses leverage Big Data for customer analytics, marketing optimization, and supply chain management. Governments utilize Big Data to enhance urban planning, traffic management, and public safety initiatives, while scientific research relies on it for climate modeling, genomics, and astronomical studies (Gandomi & Haider, 2021). These applications highlight the transformative potential of Big Data in improving efficiency, decision-making, and innovation.

CONCEPT OF MOTIVATIONAL TEACHING STRATEGIES

The term "motivational teaching strategies" refers to instructional techniques and approaches intended to pique students' curiosity, involvement, and perseverance in their studies. These tactics seek to improve extrinsic motivation, which is impacted by outside rewards like recognition or grades, as well as intrinsic motivation, which is the internal drive to learn for personal fulfillment. Teachers can encourage long-term academic performance, better comprehension, and active involvement by cultivating motivation.

In line with self-determination theory, the idea highlights the significance of developing learning settings that foster student autonomy, competence, and relatedness. Autonomy allows learners to make meaningful choices, competence ensures they feel capable of achieving learning goals, and relatedness connects learning to social and emotional contexts (Niemiec & Ryan, 2021). Motivational teaching strategies also involve personalization,

feedback, and relevance, enabling instruction to be tailored to students' abilities, interests, and real-life applications, which significantly enhances engagement (Zepeda et al., 2022).

According to recent research, these tactics aim to engage students socially, emotionally, and intellectually rather than just imparting knowledge. Active engagement and intrinsic motivation are promoted by strategies including goal-setting, cooperative learning, gamification, and self-regulated learning. Hattie and Clarke (2020) note that when students perceive learning as meaningful and achievable, motivation and academic outcomes improve substantially.

Motivational teaching strategies, which are a cornerstone of successful educational practice in both traditional and technology-enhanced classrooms, are essentially a purposeful integration of pedagogical techniques and psychological principles intended to promote student engagement, persistence, and self-directed learning.

TYPES OF MOTIVATIONAL TEACHING STRATEGIES

The goal of motivational teaching tactics is to increase students' interest, perseverance, and zeal for learning. By encouraging both internal and extrinsic motivation, these tactics empower students to actively participate in their education. Numerous motivational techniques that can be successfully incorporated into contemporary classrooms are highlighted by a recent study.

- **Mastery-Oriented Strategies**

Instead of only focusing on getting good grades, these tactics aim to increase students' proficiency and comprehension. A growth mindset is fostered by teachers' encouragement of goal-setting, introspection, and ongoing progress. According to Schunk and DiBenedetto (2020), mastery-oriented instruction increases intrinsic motivation by helping learners perceive challenges as opportunities for growth rather than threats to their self-esteem.

- **Autonomy-Supportive Strategies**

By giving students options for assignments, learning resources, or evaluation techniques, these methods provide them a sense of control over their education. Giving people autonomy has been associated with higher levels of engagement, creativity, and intrinsic motivation. Niemiec and Ryan (2021) highlight that autonomy-supportive teaching enhances student ownership of learning and promotes long-term motivation.

- **Collaborative and Social Strategies**

Cooperative projects, peer teaching, and group-based learning all use social interaction to boost motivation. Collaboration, shared accountability, and social recognition inspire students. As noted by Borup et al. (2021), collaborative strategies improve participation, accountability, and peer-driven motivation, especially in online or blended learning environments.

- **Feedback and Recognition Strategies**

Students are encouraged to identify their progress and set realistic goals when they get timely, precise, and constructive feedback. Persistence and self-efficacy are increased when effort is praised rather than natural aptitude. Hattie and Clarke (2020) emphasize that well-structured feedback is a powerful motivator that helps students regulate their learning and remain engaged.

- **Gamification and Interactive Learning**

Learning may be made more fun and engaging by incorporating game aspects like challenges, rewards, and competitiveness. AI-powered gamified activities, simulations, and adaptive tests offer individualized challenges that sustain interest. Bond et al. (2021) found that gamified learning environments significantly increase student participation and intrinsic motivation, particularly in digital learning contexts.

- **Relevance and Contextualization Strategies**

Motivation is increased when material is related to students' interests or real-world circumstances. Learners are more inclined to participate fully when they perceive the usefulness of the information. According to Zepeda et al. (2022), contextualized instruction increases curiosity, engagement, and sustained motivation.

- **Self-Regulated Learning Strategies**

Students are more autonomous and self-motivated when they are encouraged to set goals, track their progress, and consider their learning tactics. These habits are supported by tools like reflective notebooks and digital dashboards. Luckin et al. (2022) argue that AI-facilitated self-regulated learning platforms empower students to take responsibility for their motivation and learning outcomes.

ROLES BIG DATA IN PROMOTING MOTIVATIONAL TEACHING STRATEGIES

Big data has become a game-changing technology in education, especially when it comes to encouraging motivational teaching techniques that improve learning outcomes and student engagement. Teachers can use AI to customize lessons to each student's needs, encourage active engagement, and deliver timely feedback—all essential elements of motivated teaching.

- **Personalized Learning Pathways**

Big data enables the creation of personalized learning pathways by analyzing individual student performance, learning speed, strengths, and weaknesses. As noted by Walkington and Bernacki (2020), personalized learning allows instruction to be tailored to meet the specific needs of each learner. Through Big data systems, teachers can identify students who need additional support or advanced challenges and adjust instructional materials accordingly. This individualized approach increases student motivation because learners feel understood, supported, and engaged in content that matches their abilities and interests.

- **Predictive Analytics for Early Intervention**

Predictive analytics uses big data to identify students who are at risk of poor performance or disengagement before problems become severe. According to Ifenthaler and Yau (2020), predictive models analyze patterns such as attendance, assessment scores, and classroom behavior to forecast academic outcomes. Early identification allows teachers to intervene promptly through targeted support, counseling, or remedial instruction. This proactive approach enhances student motivation by preventing failure and providing timely encouragement and assistance.

- **Data-Driven Lesson Design**

Big data supports data-driven lesson design by helping educators structure lessons based on real evidence of student needs and learning gaps. As noted by Mandinach and Schildkamp (2021), data-informed instruction improves teaching quality by aligning lesson objectives with

learner performance data. Teachers can adjust content difficulty, teaching methods, and assessment strategies to ensure lessons are engaging and accessible. This relevance increases student motivation because lessons become more meaningful and aligned with their learning progress.

- **Tailored Professional Development**

Big data also contributes to tailored professional development for teachers by identifying areas where educators may need improvement or additional training. According to Schildkamp (2021), data analysis can reveal instructional weaknesses and highlight opportunities for skill enhancement. Schools and institutions can then design targeted training programs that strengthen teachers' pedagogical skills and technology use. Improved teacher competence directly enhances classroom motivation strategies, leading to more effective student engagement and learning outcomes.

METHODOLOGY

In carrying out this study, a descriptive survey design was adopted. The study was conducted in Uyo Metropolis. The target population consisted of all students and teachers in Uyo Metropolis. A simple random sampling technique was employed to select 50 students and 10 teachers from each of the five selected schools in the study area, giving a total sample size of 300 respondents. Data were collected using a structured questionnaire entitled *"Big Data and Motivational Teaching Methods Questionnaire" (BDMTMQ).* The instrument was validated by an expert in Test, Measurement, and Evaluation to ensure its suitability and clarity. A reliability coefficient of 0.92 was obtained, confirming the reliability of the instrument. Data collected were analyzed using descriptive statistics to answer the research questions

RESULTS AND DISCUSSIONS

Research Question 1:

The research question sought to examine the types of motivational teaching strategies mostly used in teaching students. To answer the research question, percentage analysis was performed on the data (see Table 1).

Table 1:

Percentage analysis of the types of motivational teaching strategies mostly used in teaching students

Types of Motivational Teaching Strategies	FRQ	%
Mastery-Oriented Strategies	52	7.33**
Autonomy-Supportive Strategies	46	15.33
Collaborative and Social Strategies	43	14.33
Feedback and Recognition Strategies	41	13.67
Gamification and Interactive Learning	38	12.67*
Relevance and Contextualization Strategies	42	14.00
Self-Regulated Learning Strategies	38	12.67*
TOTAL	**300**	**100**

**The highest percentage frequency
*The least percentage frequency
SOURCE: Field survey

Table 1 presents the percentage analysis of the types of motivational teaching strategies used in educational settings. From the result of the data analysis, it was observed that the highest percentage (17.33%) was recorded against "Mastery-Oriented Strategies", while the least percentage (12.67%) was recorded against "Gamification and Interactive Learning" and "Self-Regulated Learning Strategies". This study supports the findings of Schunk and DiBenedetto (2020), who noted that mastery-oriented instruction increases intrinsic motivation by helping learners perceive challenges as opportunities for growth rather than threats to their self-esteem. The study also aligns with the findings of Borup et al. (2021), who stated that Cooperative projects, peer teaching, and group-based learning all use social interaction to boost motivation. Collaboration, shared accountability, and social recognition inspire students. Collaborative strategies improve participation, accountability, and peer-driven motivation, especially in online or blended learning environments.

Research Question 2:

The research question sought to examine the role of big data in promoting motivational teaching strategies. To answer the research question, percentage analysis was performed on the data (see Table 2).

Table 2:

Percentage analysis of the roles of big data in promoting motivational teaching strategies

Roles of big data in promoting motivational teaching strategies	FRQ	%
Personalized Learning Pathways	82	27.33**
Predictive Analytics for Early Intervention	76	25.33
Data-Driven Lesson Design	73	24.33
Tailored Professional Development	69	23.00*
TOTAL	**300**	**100**

**The highest percentage frequency
*The least percentage frequency
SOURCE: Field survey

The above table 2 presents the percentage analysis of the role of big data in promoting motivational teaching strategies. From the result of the data analysis, it was observed that the highest percentage (27.33%) was recorded against "personalized learning pathways", while the

least percentage (23.00%) was recorded against "tailored professional development". This study agrees with Mandinach and Schildkamp (2021), who stated that data-informed instruction improves teaching quality by aligning lesson objectives with learner performance data. Teachers can adjust content difficulty, teaching methods, and assessment strategies to ensure lessons are engaging and accessible. This relevance increases student motivation because lessons become more meaningful and aligned with their learning progress. The study aligned with the opinion of Schildkamp (2021), data driven analysis can reveal instructional weaknesses and highlight opportunities for skill enhancement. Schools and institutions can then design targeted training programs that strengthen teachers' pedagogical skills and technology use. Improved teacher competence directly enhances classroom motivation strategies, leading to more effective student engagement and learning outcomes.

CONCLUSION

In conclusion, the use of big data in promoting motivational teaching methods represents a significant advancement in modern education, offering a pathway to more engaging, personalized, and effective learning experiences for pupils. By enabling educators to make informed, data-driven decisions, big data supports the identification of learners' needs, enhances instructional strategies, and fosters sustained motivation, all of which contribute to improved academic performance. However, the success of this approach depends on adequate teacher training, proper technological infrastructure, and strict adherence to ethical standards in data usage. When these elements are carefully integrated, big data becomes a powerful tool in transforming teaching practices and achieving meaningful improvements in student outcomes.

RECOMMENDATIONS

- Schools should encourage teachers to integrate big data analytics into lesson planning so that instructional strategies are aligned with pupils' learning patterns, strengths, and weaknesses.
- Educators need continuous professional development on how to interpret and apply big data insights effectively. Training should focus on learning analytics tools, data interpretation, and the design of motivational teaching strategies based on data evidence.
- Schools should implement adaptive learning systems that use big data to tailor content, pace, and teaching methods to individual pupils. Personalization enhances engagement, builds confidence, and encourages self-directed learning.

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