LEVERAGING ARTIFICIAL INTELLIGENCE TOOLS FOR TEACHERS' INSTRUCTIONAL DELIVERY IN STRENGTHENING GLOBAL BEST PRACTICES IN PUBLIC SENIOR SECONDARY SCHOOLS IN PORT HARCOURT METROPOLIS.

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Abstract

The study investigated leveraging artificial intelligence tools for teachers' instructional delivery in strengthening global best practices in public senior secondary schools in Port Harcourt metropolis. The study adopted the descriptive survey research design. The study was guided by two objectives, research questions, and two hypotheses. The population of the study stood at 1,899 while the sample size stood at 330. Cronback Alpha was employed to test the reliability and a reliability coefficient of 0.89 was obtained. Mean and standard deviation was employed in answering the research questions while hypotheses was tested using z test at 0.05 level of significance. The study revealed that grade- scope and class craft influence teachers' instructional delivery in Public Senior Secondary Schools in Port Harcourt Metropolis. The study therefore recommended among others that Schools should promote collaborative teaching models where AI supports personalized instruction, identifies learning gaps, and offers real-time feedback, while teachers focus on mentoring, emotional support, and critical thinking development.

Keywords: *Leveraging, Artificial Intelligence Tools, Teacher, Instructional Delivery*

Introduction

The progression of Industrial Revolutions, particularly the advancements in computing power, data storage, and algorithm development throughout the 20th century, laid the foundation for the emergence of Artificial Intelligence (AI), which is often considered the driving force behind the "Fourth Industrial Revolution." The First Industrial Revolution marked the transition from hand production methods to machines through the introduction, Port Harcourt. of the steam engine. This powerful innovation revolutionized transportation and manufacturing, catapulting productivity and facilitating global trade. It laid the foundation for modern industrialization, transforming rural societies into urban hubs and shaping the economic landscape of the 18th and 19th centuries. Building on the mechanical innovations of the first revolution, the second phase introduced electricity and advanced steel production. These technologies powered vast new infrastructures and industries, from railroads spanning continents to factories that lit up the night. The impact was staggering, ushering in an era of mass production and technological marvels that defined the late 19th and early 20th centuries. This technological progression paved the way for the next major industrial shift (Bupo, 2024).

The advent of computers and the internet characterized the Third Industrial Revolution. This era of digital technology transformed how we process information, communicate, and conduct business. Automation became a cornerstone of manufacturing, and the digital landscape emerged as a global village, bringing distant societies into immediate contact. As we ventured into the 21st century, the fourth revolution took hold through the emergence of artificial intelligence, the Internet of Things (IoT), and robotics. These technologies blurred the lines between the physical, digital, and biological spheres (Schwab, 2016), reshaping our world into an interconnected ecosystem where efficiency and innovation are continually advancing at an unprecedented pace. While still unfolding, the Fifth Industrial Revolution is distinguished by the advent of generative AI, which is marked as having begun just two years ago. This revolution is fundamentally different from its predecessors, characterized by a clear delineation between past and future. It is defined by autonomous operations and innovative methodologies across all industries (Cox, 2021). The integration of AI into daily life and business operations represents a seismic shift, promising to redefine creativity, productivity, and personal interaction.

In this field of education, this advancements are beginning to reshape fundamental aspects such as curriculum development and implementation. Curriculum development is a critical component of the educational process, ensuring that learning objectives align with the evolving needs of society. The integration of AI tools in curriculum design enables teachers to tailor instructional materials based on student needs, learning styles, and performance analytics. AI driven curriculum planning

can facilitate the creation of personalized learning experiences, optimizing content delivery for maximum engagement and retention. In public senior secondary schools, AI applications such as ChatGPT helps in designing lesson plans , curriculum fireworks and instructional materials, it can also provide summaries , explanations and alternative teaching methods (Becta, 2014). The implementation of AI-based curriculum tools allows for continuous updates and improvements, ensuring that educational content remains current and aligned with global standards. These enhancements in curriculum development naturally lead to improved assessment and evaluation methodologies.

Assessment and evaluation are fundamental to monitoring student progress, measuring learning outcomes, and refining instructional strategies. AI-powered assessment tools can provide real-time feedback, automate grading processes, and generate in-depth performance analytics (Lucky et al., 2016). These technologies help teachers identify learning gaps, predict student performance, and offer targeted interventions to enhance academic achievement (Cox, 2021). In public senior secondary schools, grade scope is used to assist with grading assignments, exams and even hand written work. However, the effectiveness of assessments also depends on well-structured classroom management and learning environments.

Effective classroom management is essential for creating a conducive learning environment that fosters student engagement and academic success (Das, 2019). AI-driven classroom management tools, such as class craft gamifies class room management to improve student engagement and behavior, it also uses AI to analyze student participation and collaboration. The integration of AI in classroom management promotes a more structured and efficient learning environment, enhancing student discipline and participation in public senior secondary schools. As AI optimizes classroom environments, its role in educational technology integration becomes even more prominent (Ejiroghene, 2021).

Artificial Intelligence (AI) refers to simulating human intelligence in machines that are programmed to think like humans and mimic their actions (Ajah & Chigozie-Okwum, 2019). The term can also be applied to any machine that has features associated with a human mind, such as: Learning and problem solving. It is a broad term for computers and software that work more like humans than computers or traditional software. With conventional computing, software is executed according to certain programmed steps. It was revolutionary in itself and allowed us to do more than we previously imagined Schmidhuber (2015).

Artificial intelligence is based on the principle that human intelligence can be defined so that a machine can easily imitate it and perform tasks, from the simplest to the most complex. The goals

of artificial intelligence include learning, thinking and perceiving. As technology advances, the previous benchmarks that have defined artificial intelligence are becoming obsolete (Kaplan & Heanlein, 2019). For example, machines that calculate basic functions or recognize text through optimal character recognition are no longer considered to be the embodiment of artificial intelligence, since this function is now taken for granted as an inherent computer function. AI continues to evolve for the benefit of many different industries. The machines are wired according to an interdisciplinary approach based on mathematics, computer science, linguistics, psychology, etc.

Artificial Intelligence (AI) has emerged as a transformative force across various sectors, offering innovative solutions to complex problems. In the realm of education, AI holds the potential to revolutionize traditional teaching methods and streamline research processes. Artificial Intelligence refers to the development of computer systems capable of performing tasks that typically require human intelligence Chandio (2021). This includes a range of technologies, including machine learning, natural language processing, and data analytics. AI systems leverage algorithms and data to simulate cognitive functions, enabling machines to analyze information, adapt to changing circumstances, and improve performance over time Russell & Norvig (2020).

Class craft, is a cloud-based digital game platform that operates across various devices, is one of five popular educational digital game platforms (Dambo & Uranta, 2018). It is designed as a gamified educational tool for learners. Gamification is a newly coined term used to describe the implementation of game components, such as game psychology, game mechanics, and game dynamics to non-game situation. Gamification is the process of incorporating game mechanics and game thinking into activities aside from non-game situations to increase student engagement and solve problems (Ukeh, 2020). Gamifications can also be defined as the utilization of game mechanics and experience design to engage people digitally and to motivate people to attain their goals. Gamification gathers attention due to its ability to affect behavior and provide successful outcomes. Games stimulate strong emotional responses, such as frustration, curiosity, and joy. In addition, people's productivity and engagement increase when playing game.

Class craft has been successfully employed in primary school, high school, and even several university courses. The main theme and general model of Class craft is inspired by role-play game (RPG) and it is named after a massively popular multiplayer online role-playing game (MMORPG), World of Warcraft. Shawn Young created the first version of Class craft in January 2011 for personal use. Class craft works as augmented reality and employs a layer of fantasy over life in the classroom (Das, 2019). The main objective of Class craft is to make the learning atmosphere engaging and reflexive and to stimulate the collaboration among learners. Usually, learners are divided into teams

consisting of 4-6 learners. Learners are then given an opportunity to decide which game character they want to play, a warrior, a mage or a healer (Das, 2019). Different personas have their own unique set of powers and diverse rewards to support their team. Just like any other game, each character has five attributive cores namely XP (Experience Points), AP (Action Points), HP (Health Points), PP (Power Points), and GP (Gold Points). XP is used for leveling up; AP is for using student's power; HP is for representing student's energy life; PP is for unlocking new powers; and GP is for customizing student's avatar.

In addition to basic game elements such as PBL (point, badge, and leaderboard), Class craft also provides other game elements such as instant feedback, quest, avatar, and reward. Class craft is not only incorporating reward-based component but it also attempts to make student intrinsically motivated by allowing learners to manage their own learning process. This philosophy, primarily used in video games, is based on Self-Determination Theory postulating human's innate needs for competence, autonomy and relatedness. Competence is human's need to control the environment and form a desirable outcome; autonomy is the desire to act based on individual's will and interest; relatedness is the sense of belonging to a group or related to others. Another advantage of Class craft is the design of Class craft that is purposely created to manage courses, maintain learners' presence in the class and involve learners' participation during the learning process.

Grade-scope is an online grading tool for scanned, pen-and-paper, free-response assessments. This tool supports workflows for both individual student assignment (homework) and instructor upload of assessments (exams). Grade-scope makes it easy and efficient to organize, grade, and provide consistent feedback for assignments and exams. Grade-scope provides a dynamic point adjustment rubric that allows you to modify rubric items and values while you're grading. Grade-scope integrates with Bright space making it easy to sync your course roster and push grades to grade center. Grade-scope is a feedback and assessment tool that reduces the pain and time associated with grading exams, homework, and other assignments. It is widely used for delivering assessments remotely and enables instructors and graders to provide better and timelier feedback, resulting in improved learning outcomes. By centralizing student submissions, scoring rubrics, individualized feedback, and statistical insights, Grade-scope allows instructors to have a more streamlined grading system with their students. From homework to coding assignments to exams. Grade-scope is an ideal tool for assessing and providing feedback for student assignments, including written formulas, graphs, calculations, and other kinds of work that cannot be easily graded through SpeedGrader. Students can upload their own hand-written work or other assignments to Grade-scope. While Grade-scope can assess and provide feedback for high-stakes exams, it is not a tool that can replace exam proctoring software, such as Proctorio or Respondus Monitor.

Teachers play a pivotal role in the learning process, particularly in the way knowledge is delivered a process that significantly contributes to national development. However, (Dhawan, 2022) opined that many teachers are unprepared and not equipped with the knowledge and abilities necessary to use artificial intelligence. Most public school teachers are unenthusiastic about the changes because of their unwillingness to keep up with technological development. These result in teachers' inability to utilize the e-learning approach to teaching, their inability to impart 21stcentury skills to the students, and their failure to understand the different learning styles among them (Dhawan, 2020). These concerns form the basis for investigating, leveraging artificial intelligence tools for teachers' instructional delivery in strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis.

The purpose of this study was to examine the influence of artificial intelligence tools on teachers' instructional delivery in Public Senior Secondary Schools in Port Harcourt Metropolis. Specifically, the study sought to;

1. Determine the influence of grade-scope on teachers' instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis.
2. Examine the influence of class craft on teachers' instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis

The following research questions guided the study;

10. To what extent does grade- scope influence teacher's instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis?
11. To what extent does class craft influence teacher's instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis?

The following hypotheses guided the study.

4. There is no significant difference in the mean ratings of male and female teachers on the extent grade-scope influence instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis.
5. There is no significant difference in the mean r tings of male and female teachers on the extent class craft influence instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis.

Methodology

The study adopted the descriptive survey research design. The population of this study is 1,899, this comprises all the teachers from the 39 senior secondary schools in Port Harcourt Local Government Area. (Rivers State Senior Secondary School's Board, 2025). The study adopted the simple random sampling technique. The sample of the study stood at 330, this was estimated using Taro Yamane Formula. The instrument for data collection was a self-structured instrument titled Leveraging artificial intelligence tools for teachers' instructional delivery in strengthening global best practices Questionnaire (LAITIDSGBPQ)**.** The instrument was given a face and content validity by two experts from the Department of Educational Management, Rivers State University, Port Harcourt. The reliability of the instrument was determined using Cronbach's Alpha and a reliability coefficient of 0.89 was obtained. The instrument was administered by the researcher and one research assistant. The copies of the instrument responded to were retrieved immediately while others were retrieved latter.

Mean and standard deviation was used to answer the research questions while the z-test analysis tool was used to test the hypothesis at 0.05 level of significance.

Results

Research Question 1: To what extent does Grade Scope influence teachers' instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis?

Table 2: Mean and Standard Deviation Analysis on the extent Grade-Scope influence teachers' instructional delivery for strengthening global best practices **in Public Senior Secondary Schools in Port Harcourt Metropolis**
N=330

		Male =185			Female = 145		
S/N	**Questionnaire Items**	**Mean**	**SD**	**Remarks**	**Mean**	**SD**	**Remarks**
5	Grade scope streamlines the assessment process enabling teachers to allocate more time to planning.	3.39	0.72	High Extent	3.65	0.49	High Extent
6	Grade scope supports fairness in grading.	3.66	0.64	High Extent	3.28	0.87	High Extent

7	The use of grade scope encourages data-driven instruction.	3.54	0.76	High Extent	3.36	0.99	High Extent
8	The integration of grade scope improves teachers confidence in using digital tools for assessment. .	3.65	0.77	High Extent	2.59	1.09	High Extent
	Grand Total	**3.56**	**0.72**		**3.22**	**0.86**	

Source: SPSS output (2025).

Table 1: The result in table 1 above showed the extent to which Grade Scope influence teachers' instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis. As seen on the table, the respondents agreed with all the items on the table as the extent to which Grade Scope influence teachers' instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis. The confirmation was made with a grand mean of 3.56 and 3.22 and standard deviation of 0.72 and 0.86 as responses of the respondents on both male and female.

Research Question 2: To what extent does Class Craft influence teachers' instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis?

Table 1: Mean and Standard Deviation Analysis on the extent Class Craft influence teachers' instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis

N =330

		Male 185			**Female = 145**		
S/N	**Questionnaire Items**	**Mean**	**SD**	**Remarks**	**Mean**	**SD**	**Remarks**
1	Class craft encourages teachers to adopt student centered instructional strategies.	3.72	0.70	High Extent	2.76	1.16	High Extent
2	Class craft motivates teachers to diversify their teaching methods.	3.70	0.64	High Extent	3.55	0.67	High Extent
3	Teachers using class craft report improved classroom management.	3.40	0.85	High Extent	3.22	0.99	High Extent.
4	Class craft fosters a positive classroom environment.	3.36	0.98	High Extent	3.05	1.07	High Extent

Grand Total	**3.81**	**0.81**	**3.66**	**0.97**	High Extent

Source: SPSS output (2025).

Table 2: The result in table 2 showed that all the items were on a high extent. The respondents agreed with all the statements on the table as the extent to which Class Craft influence teachers' instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis. The confirmation was made with a grand mean of 3.81 and standard deviation of 0.81 for male respondents while that of female were 3.66 and 0.97 for mean and standard deviation.

Hypotheses Testing

Table 3: z-test Analysis on no significant difference in the mean ratings of male and female teachers on the extent grade scope influence instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis.

Respondents	N	$\bar{X}$	Σ	df	z-calc	z-crit	LS	Decision
Male Teachers	189	3.56	0.72	328	1.5856	±1.96	0.05	Accepted
Female Teachers	141	3.22	0.86					

Source: SPSS output, (2025).

The analyzed data on table 3 above showed that the z-calculated value of 1.5856, is less than the z-crit value of 1.96 at 0.05 level of significance and 328 degree of freedom suggesting that there is no significant difference in the mean ratings of male and female teachers on the extent grade scope influence instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis. Therefore, the null hypothesis was accepted, which state that there no significant difference in the mean ratings of male and female teachers on the extent grade scope influence instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis.

Table 4: z-test Analysis on no significant difference in the mean ratings of male and female teachers on the extent class craft influence instructional delivery for strengthening global best practices in Public Senior Secondary Schools in Port Harcourt Metropolis.

Respondents	N	$\bar{X}$	Σ	df	z-calc	z-crit	LS	Decision
Male Teachers	189	3.81	0.81	328	1.2745	±1.96	0.05	Accepted
Female Teachers	141	3.66	0.97					

Source: SPSS output, (2025)

The analyzed data on table 4 above shows that the z-cal value of 1.6745 is less than z-crit value of 1.96 at 0.05 level of significance and 328 degree of freedom, suggesting there is no significant difference in the mean ratings of male and female teachers on the extent to which class craft influence their instructional delivery in Public Senior Secondary Schools in Port Harcourt Metropolis. Therefore the null hypothesis was accepted. Thus, there is no significant difference in the mean ratings of male and female teachers on the extent to which class craft influence their instructional delivery in Public Senior Secondary Schools in Port Harcourt Metropolis.

Discussion of findings

Grade- Scope and Teachers Instructional Delivery

The findings on research question one proved that grade- scope influence teachers instructional delivery in Public Senior Secondary Schools in Port Harcourt Metropolis. More so, hypotheses 1 analyzed on table 3 showed that there is no significant difference in the mean ratings of male and female teachers on the extent to which grade scope influence their instructional delivery in Public Senior Secondary Schools in Port Harcourt Metropolis. This finding is in tandem with that of Adeyemi (2024) who found that grade-scope supports workflows for both individual student assignment (homework) and instructor upload of assessments (exams). Supporting further, Das (2019) stated that grade-scope makes it easy and efficient to organize, grade, and provide consistent feedback for assignments and exams. Grade-scope provides a dynamic point adjustment rubric that allows you to modify rubric items and values while you're grading. Grade-scope integrates with Bright space making it easy to sync your course roster and push grades to grade center. Furthermore, Adeyemi (2024) found that Grade-scope supports a wide range of assessment types, including fully paper-based (instructor or student uploaded), fully online, Hybrid online/handwritten, Code/programming, Essays/reports, Multi-user Grading, Homework.

Class Craft and Teachers' Instructional Delivery

The findings on research question two proved that class craft influence teachers' instructional delivery in Public Senior Secondary Schools in Port Harcourt Metropolis. More so, hypothesis 2 analyzed on table 4 showed that there is no significant difference in the mean ratings of male and female teachers on the extent to which class craft influence their instructional delivery in Public Senior Secondary Schools in Port Harcourt Metropolis. The finding is in agreement with the view of Das (2019) who found that class craft provides game elements such as instant feedback, quest, avatar, and reward. It does not only incorporating reward-based component but it also attempts to make student intrinsically motivated by allowing learners to manage their own learning process. Supporting further, Ukeh (2020) averred that class craft works as augmented reality and employs a layer of fantasy over life in the classroom. The main objective of Class craft is to make the learning atmosphere engaging and reflexive and to stimulate the collaboration among learners.

Conclusion

Artificial intelligence has introduced new dimensions for strengthening best global practices in teaching, by enhancing lesson planning, enabling personalized learning, automating administrative tasks, and providing data-driven insights into student performance. These advancements empower teachers to focus more on student engagement and critical thinking rather than routine tasks. However, the integration of AI also presents challenges, such as the need for adequate infrastructure, professional development, and ethical considerations regarding data privacy and bias. To maximize the benefits of AI in instructional delivery, there must be continuous support from educational policymakers, investment in teacher training, and a balanced approach that combines human expertise with technological innovation.

Recommendations

Based on the findings of this study the following recommendations were made:

- Governments and education stakeholders should ensure that public senior secondary schools are equipped with the necessary digital infrastructure such as internet access, smart devices, and reliable electricity to support the integration of AI tools like Grade-scope for effective instructional delivery in public secondary schools. This will keep the schools aligned with the 21st century global practices.

- Ministry of education should ensure that teachers receive regular, hands-on training to effectively integrate AI tools like class craft into their instructional delivery so that the teachers will be abreast with the best global practices in education.

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