
Integrating Innovative Pedagogies, Creativity And Technology In Modern Classrooms In Public Secondary Schools In Bayelsa State

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Abstract

The study investigated innovative pedagogies: integrating creativity and technology in modern classrooms in public secondary schools in Bayelsa State. The study was guided by two research questions and two hypotheses. The Technological Pedagogical Content Knowledge Framework for Innovative Pedagogies, developed by Mishra and Koehler (2006) was employed for the study. Descriptive survey design was used in the study while 1,459 teachers in senior secondary school teachers in Yenagoa Education Zone in Bayelsa State formed the population of the study. The sample size was 438 teachers representing 30% of teacher population. Stratified random sampling technique was used to select teacher respondents. "Integrating Creativity and Technology in Modern Classrooms Questionnaire (ICT-ICQ)" was used for data collection. The instrument was validated by expert while test Cronbach Alpha method was used to establish the reliability of the instrument with a reliability index of 0.74. Out of the 439 distributed questionnaires, 411 copies of the instrument were returned and used for data analysis. Mean and standard deviation were used to address all the research questions while t-test was used for hypotheses testing. The study found that the study is no significant difference between the responses of male and female teachers regarding the integration of gamification into classrooms. This suggests that both genders, regardless of teaching experience, recognize the potential of gamification in enhancing student engagement and learning outcomes. It reflects a shared understanding of how innovative pedagogies can be effectively implemented in the classroom. Similarly, the study discovered that there is no significant difference between male and female teachers in their responses about the integration of technology-enhanced learning. This finding further supports the notion that both genders, regardless of teaching experience, acknowledge the role of technology in fostering interactive and effective learning environments. Hence, the study concluded that integrating creativity and technology in modern classroom will enhance effective pedagogies and make the teaching process innovative. Hence, gamification and technologies enhanced-learning will impact and simplify learning for students. Based on the findings, the researcher recommends that teachers should blend their teaching styles to reflect innovativeness, since teaching and the society are dynamic and becoming more technological in nature.

KEY WORDS: Innovative Pedagogies, Integration, creativity, Technology, Modern Classroom.

Introduction

Innovative pedagogies encompass fresh and creative teaching strategies designed to elevate the learning experience, boost student engagement, and foster deeper understanding and critical thinking. These pedagogies frequently integrate technology, interdisciplinary methods, collaborative learning, and real-world problem-solving to cultivate a more dynamic and effective educational environment. Recently, there has been a notable shift in educational paradigms, propelled by the need to heighten student engagement, nurture creativity, and enhance learning outcomes. The adoption of innovative pedagogies, particularly gamification, technology-enhanced learning, and flipped classrooms, has become a vital strategy in contemporary education. These methods harness the power of technology and inventive teaching techniques to create a more interactive and engaging learning environment.

Gamification, which involves applying game-design elements in non-game contexts, has attracted considerable attention in educational settings. This pedagogical approach aims to boost student motivation and engagement by incorporating elements such as points, badges, leaderboards, and challenges into the learning process (Deterding et al., 2011). Research shows that gamification can significantly enhance student motivation, leading to better participation and academic performance (Hamari et al., 2014). By transforming traditional classroom activities into interactive and competitive experiences, gamification encourages students to actively engage in their learning, thereby promoting a deeper understanding of the material (Domínguez et al., 2013).

Conversely, technology-enhanced learning (TEL) involves using digital tools and resources to facilitate and enrich the educational experience. This approach includes a wide range of technologies such as online learning platforms, interactive simulations, virtual reality, and educational apps. TEL has been demonstrated to improve accessibility, offer personalized learning experiences, and support diverse learning styles (Bower, 2017). The integration of technology in the modern classroom allows for more flexible and adaptive teaching methods, addressing individual student needs and promoting self-directed learning. Furthermore, TEL enables the use of multimedia content, which can enhance comprehension and retention by presenting information in various formats. Based on the above, the researcher intends to investigate how integrating creativity and technology in modern classrooms can enhance innovative pedagogies in public secondary schools in Bayelsa State.

Statement of the Problem

The educational landscape is undergoing a rapid transformation, driven by the demands of the 21st century and the widespread integration of technology. Traditional teaching methods, which predominantly rely on lecture-based instruction and rote memorization, are increasingly being questioned for their effectiveness in promoting critical thinking, creativity, and student engagement. As we move further into the technological age, it is crucial to reassess and innovate pedagogical practices to better prepare students for the complexities and challenges of the modern world.

Traditional teaching methods have long been a cornerstone of educational systems globally, typically involving a teacher-centered approach where the instructor delivers information through lectures, and students passively receive and memorize the content. While effective in certain contexts, this approach presents significant challenges in the contemporary educational environment.

Traditional methods often fail to actively engage students, as passive reception of information does not encourage interaction with the material, questioning, or critical thinking. Rote memorization does not cultivate essential skills such as creativity, problem-solving, and analytical thinking, which are crucial for success in the 21st century, where adaptability and innovation are highly valued. In an era where technology is pervasive, traditional teaching methods often fail to utilize digital tools and resources that can enhance learning, leaving students unprepared for a technology-driven world.

Therefore, there is an urgent need for a paradigm shift from traditional teaching practices to innovative pedagogies that incorporate creativity and technology. Innovative pedagogies, such as gamification and project-based learning, can make learning more interactive and enjoyable, thereby increasing student motivation and engagement. Technology-enhanced learning allows for personalized and adaptive learning experiences that cater for individual student needs and learning styles, improving outcomes and equity in education. Integrating technology into pedagogy ensures that students develop the digital skills and literacies essential for the modern workforce. Consequently, this research focuses on integrating innovative pedagogies, creativity and technology in modern classrooms in public secondary schools in Bayelsa State.

Aim and Objectives

The study aims at investigating innovative pedagogies: integrating creativity and technology in modern classrooms in public secondary schools in Bayelsa State. In specific terms, the study will determine:

1. How gamification can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State.
2. How technology-enhanced learning (TEL) can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State.

Research Questions

The following research questions will guide the study.

1. How can gamification be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State?
2. How can technology-enhanced learning (TEL) be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State?

Hypotheses

1. There is no significant difference between the opinion mean ratings of teachers on how gamification be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State based on their teaching experiences.

2. There is no significant difference between the opinion mean ratings of teachers on how technology-enhanced learning (TEL) be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State based on their teaching experiences.

Literature Review

Pedagogy is central to teaching and learning. To prepare young people as lifelong learners with deep subject knowledge and strong social skills, it's crucial to understand how pedagogy impacts learning. Innovative pedagogy is not simply about “new” teaching methods. While often associated with new strategies, not all new methods are innovative. Additionally, innovative pedagogies are not solely tied to technology, though digital support is often integrated into the teaching process.

The term “innovative pedagogies” is increasingly used to describe the learning outcomes—knowledge, skills, responsibility, and autonomy—needed for today's students to succeed and contribute to a better future. It also refers to how instructional systems can effectively develop these outcomes. Addressing the factors influencing the use of innovative pedagogies in educational practices requires careful consideration. Evidence shows that teachers are eager to adopt more active, innovative forms of education to meet their students' diverse learning needs. However, due to various constraints, they often revert to traditional, conservative approaches (Averill and Major, 2020).

Innovative pedagogical technology is considered as a special organization of activity and thinking aimed at organizing innovations in the educational space, or as a process of assimilation, implementation and dissemination of new things in education. Innovation of the pedagogical process means the introduction of something new into the target, content, forms and methods of teaching and upbringing, into the company of joint activities of the participants in the educational process.

Innovative technologies used in the higher education system are considered as the teacher's modeling of the content, forms and methods of the educational process in accordance with the set goal using novelty. In the practice of educational activities of a modern university, such teaching technologies are used as: differentiated, problem-based, contextual learning, game learning technologies, information technologies, credit-modular technology, student-centered learning, etc. (Bingimlas, 2009).

One of the types of application of modern innovative teaching technologies in the process of professional training of a future teacher is information teaching aids, for the successful and purposeful use of which university teachers must know their didactic capabilities and principles of functioning. The effectiveness of the use of modern information technologies in the development of the foundations of the pedagogical skills of the future teacher is provided by a variety of forms of information presented, a high degree of clarity; the possibility of organizing collective and individual research work. The introduction of innovative technologies in the process of professional training of a future teacher helps them to master the educational material at an individual pace, independently, using convenient ways of perceiving information, which causes them positive emotions and forms a positive motivation for learning. In order to intensify the professional training of students in universities through the introduction of computer presentations, electronic dictionaries, textbooks and manuals; test programs, textbook programs, training programs, dictionaries, reference books,

encyclopedias, video tutorials, libraries of electronic visual aids, thematic computer games, etc., a professionally oriented educational information environment is created that contributes to the development of the foundations of the pedagogical skills of future teachers (Cooper, 2022).

Educational innovations are characterized by a purposeful process of partial changes leading to the modification of the goal, content, methods, forms of education, methods and style of activity, adaptation of the educational process to the modern requirements of the time and social demands of the labor market. In addition, the introduction and approval of something new in educational practice is due to positive transformations, therefore, it should become a means of solving urgent problems of a particular educational institution and withstand experimental testing for the final application of innovations. First of all, this should consist in modern modeling, the organization of non-standard lectures, practical, seminars; individualization of teaching aids; office, group and additional training; optional, at the choice of students, deepening of knowledge; problem-oriented learning; scientific and experimental in the study of new material; development of a new control system for assessing knowledge; the use of computer, multimedia technologies; educational and methodological products of a new generation

Currently, the following pedagogical technologies are most often used in educational practice (González-Zamar, et al, 2020):

- structural and logical technologies: the phased organization of the training system, providing a logical sequence for the formulation and solution of didactic problems based on the phased selection of content, forms, methods and means, taking into account the diagnosis of results;
- integration technologies: didactic systems that ensure the integration of interdisciplinary knowledge and skills, different types of activities at the level of integrated courses (including electronic);
- professional and business gaming technologies: didactic systems for using various "games", during which the skills of solving problems are formed on the basis of a compromise choice (business and role-playing games, simulation exercises, individual training, computer programs, etc.);
- training tools: a system of activities for the development of certain algorithms for solving typical practical problems using a computer (psychological trainings for intellectual development, communication, solving managerial problems, etc.);
- information and computer technologies implemented in didactic computer training systems based on the "man-machine" dialogue with the help of a variety of training programs (training, control, information, etc.);
- dialogue and communication technologies: a set of forms and methods of teaching based on dialogue thinking in interacting didactic systems of the subject-subject level.

In educational practice, the diversification of teaching technologies allows you to actively and effectively combine them through the modernization of traditional education and its reorientation to an effective, purposeful one. With this approach, there is an emphasis on the personal development of future specialists, the ability to master

new experience of creative and critical thinking, role-based and simulation modeling of the search for solutions to educational problems.

Majuri, Koivisto, and Hamari, (2018) in their research indicated that fulfilling four essential needs can create a conducive environment for fostering innovative teaching methods among educators. These needs are:

- Competence,
- Autonomy,
- Relatedness, and
- Well-being as a resultant condition.

Gamification as innovative pedagogy

Gamification involves using game elements to motivate users, enhance engagement, and achieve goals. This concept can be applied to non-game contexts, making it useful for organizations and individuals seeking higher performance and success through specific behaviors. Gamification, which uses gaming mechanisms from popular games, has been a popular topic in both industry and academia since the early 2010s, particularly in educational contexts (Huotari & Hamari, 2017). Kapp defines it as “using game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems” (Kapp, 2012). In essence, gamification applies game thinking and elements to non-game contexts, improving motivation and learning in both formal and informal settings. It transfers game designs into environments like classrooms to encourage students to actively participate in learning new skills.

Software Tools for Gamification

There are so several tools for gamification. Some of them are web-based (cloud services) and do not require installation of special software and allow access at any time and from any location. Among the most popular gamification tool are:

Kahoot, Gimkit, Quiziz and Moodle (some of Moodle gamification capabilities are: user’s picture, visibility of the students’ progress, display of quiz results, levels, feedback, badges, leader board).

Challenges of Gamification in Education

Using gamification for learning presents several challenges: ensuring educational goals are not overshadowed by game elements, creating high-quality gamified content requires specialized knowledge, adapting gamified content across subjects and levels is difficult, maintaining student interest can be challenging, over-reliance on extrinsic rewards may undermine intrinsic motivation, aligning gamified elements with curriculum standards, creating meaningful assessments in gamified environments, unequal access to technology and internet, ensuring content is engaging for all students regardless of background or ability, potential for demotivation or stress among students, risk of students focusing too much on gaming aspects, difficulty in measuring learning

outcomes, and managing and protecting student data collected through gamified platforms.

Technology Enhanced Learning as innovative pedagogy

Technology-Enhanced Learning (TEL) refers to the use of technology to improve and facilitate the learning process. TEL encompasses a wide range of digital tools and methodologies aimed at enhancing the teaching and learning experience. This approach leverages technology to support, enrich, and extend educational practices, making learning more effective, engaging, and accessible.

The key aspects of technology-enhanced learning are E-Learning Platforms, Blended Learning, Interactive Learning Tools, Mobile Learning (M-Learning), Collaborative Learning Tools, Virtual and Augmented Reality (VR/AR), Artificial Intelligence (AI) and Machine Learning, Digital Assessments and Analytics, Content Creation and Curation Tools, social media and Networking and Remote and Distance Learning Technologies.

The Technological Pedagogical Content Knowledge Framework for Innovative Pedagogies

The Technological Pedagogical Content Knowledge (TPACK) framework, developed by Mishra and Koehler (2006), builds on Shulman's (1986) concept of Pedagogical Content Knowledge (PCK) by integrating technology as a fundamental element of effective teaching. The Technological Pedagogical Content Knowledge (TPACK) framework offers a comprehensive approach to understanding and implementing innovative pedagogies, especially when integrating creativity and technology in modern classrooms. By examining TPACK, educators can better appreciate the complexities involved in designing and delivering effective instruction that leverages technology and fosters creativity. The central premise of TPACK is that successful teaching with technology necessitates an understanding of the intricate relationships between technology, pedagogy, and content.

Components of TPACK

- 1.Content Knowledge (CK):** This enhances the teacher's knowledge about the subject matter to be taught.
- 2.Pedagogical Knowledge (PK):** This enhances the methods and processes of teaching and learning, including instructional strategies and classroom management.
- 3.Technology Knowledge (TK):** This improves the understanding of how to use various technological tools and resources.
- 4.Pedagogical Content Knowledge (PCK):** This integrates pedagogy and content, focusing on how specific subject matter should be taught.
- 5.Technological Content Knowledge (TCK):** This examines how technology and content interact, emphasizing how technology can represent and transform content knowledge.
- 6.Technological Pedagogical Knowledge (TPK):** This explores how teaching and learning can change when particular technologies are used.

7. Technological Pedagogical Content Knowledge (TPACK): This is the intersection of CK, PK, and TK, representing the understanding required to integrate technology.

Methodology

The research utilized a descriptive survey design. The study's population included all Senior Secondary School teachers in Yenagoa Education Zone in Bayelsa State, totaling 1,459 teachers as at the time of the study comprising 513 male teachers and 946 female teachers. The sample size was 438 teachers representing 30% of teacher population in the Educational Zone, also comprising 153 male teachers and 284 female teachers. Stratified random sampling technique was used to select teachers from different schools in the study area. Data collection was conducted using a questionnaire titled "Integrating Creativity and Technology in Modern Classrooms Questionnaire (ICT-ICQ)." The questionnaire items were based on a 4-point Likert scale, ranging from Strongly Agree (SA) = 1, Agree (A) = 2, Disagree (D) = 3, to Strongly Disagree (SD) = 4. Two experts from the Department of Foundation and Arts Education validated the instrument for content and face validity. The instrument's reliability was confirmed with reliability index of 0.74. Out of the 438 distributed questionnaires, 411 copies of the instrument were returned and used for data analysis. Mean and standard deviation were used to address all research questions, while t-test was used in hypotheses testing. All statistical analyses were conducted using the Statistical Package for Social Sciences (SPSS) version 25.

RESULTS

Research Questions One: How can gamification be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State?

Table 1: Mean responses on how gamification can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State.

| S/n | Items | Male n=153 | | Female n=283 | | MS | Remarks |
|-----|---|---------------|------|-----------------|------|------|------------------------|
| | | Mean | SD | Mean | SD | | |
| 1. | Teachers engage quizzes and interactive games for classrooms like Kahoot to fosters student engagement and makes learning fun through competitive quizzes. | 3.10 | 0.83 | 2.97 | 0.87 | 3.02 | Strongly Agreed |
| 2. | Teachers use Classcraft to promote teamwork and motivation in order to transform the classroom into a role-playing game where students earn points and rewards for positive behavior and academic achievements. | 3.28 | 0.61 | 3.23 | 0.65 | 3.25 | Strongly Agreed |
| 3. | Teachers use Duolingo to teach languages through gamified lessons. Duolingo uses levels, rewards, and challenges to make language learning interactive and enjoyable. | 3.05 | 1.02 | 3.02 | 1.04 | 3.03 | Strongly Agreed |
| 4. | Teachers use the popular game Minecraft for educational purposes, teaching subjects like math, history, and coding in a creative and immersive environment. | 3.05 | 0.84 | 3.02 | 0.88 | 3.03 | Strongly Agreed |

| | | | | | | | |
|--------------------|---|-------------|-------------|-------------|-------------|-------------|------------------------|
| 5. | Teachers use Prodigy Math Game to teach math through an adaptive learning platform where students engage in a fantasy-based game while practicing math skills. | 3.18 | 0.93 | 3.18 | 0.96 | 3.18 | Strongly Agreed |
| 6. | Teachers use Quizlet too help students learning through flashcards, games, and interactive tests to offers various study modes and games to reinforce learning. | 3.24 | 0.84 | 3.24 | 0.81 | 3.24 | Strongly Agreed |
| 7. | Teachers use Seesaw to create a digital portfolio for students, allowing them to showcase their work and progress through interactive activities and games. | 3.48 | 0.67 | 3.43 | 0.74 | 3.45 | Strongly Agreed |
| 8. | Teachers use Scratch to teach coding and computational thinking through interactive projects and games. Scratch allows students to create their own games and animations, making learning to code fun and accessible. | 3.45 | 0.67 | 3.38 | 0.72 | 3.41 | Strongly Agreed |
| 9. | Teachers use Plickers use to conduct real-time assessments through interactive quizzes where students use cards to answer questions | 3.27 | 0.68 | 3.23 | 0.71 | 3.25 | Strongly Agreed |
| 10. | Teachers use BrainPOP to teach various subjects through animated videos and interactive games. | 3.16 | 0.73 | 3.07 | 0.79 | 3.11 | Strongly Agreed |
| Grand Total | | 3.23 | 0.78 | 3.18 | 0.82 | 3.20 | Strongly Agreed |

The data in table 1 shows that how gamification can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State. The table also showed teachers can Quizlet help students learning through flashcards, games, and interactive tests to offers various study modes and games to reinforce learning (Mean=3.24), teachers can seesaw to create a digital portfolio for students, allowing them to showcase their work and progress through interactive activities and games (Mean=3.45), teachers can scratch to teach coding and computational thinking through interactive projects and games. scratch allows students to create their own games and animations, making learning to code fun and accessible (Mean=3.41), teachers can use Plickers to conduct real-time assessments through interactive quizzes where students use cards to answer questions (Mean=3.25) among others as shown on the table above.

Research Questions Two: How can technology-enhanced learning (TEL) be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State?

Table 2: Mean responses on how technology-enhanced learning (TEL) can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State.

| S/n | Items | Male n=153 | | Female n=283 | | MS | Remarks |
|-----|--|---------------|------|-----------------|------|------|------------------------|
| | | Mean | SD | Mean | SD | | |
| 11. | Engaging students in Learning Management Systems (LMS) like Moodle, Canvas, and Blackboard deliver course materials, track progress, and manage educational content for effective learning | 3.07 | 0.90 | 3.08 | 0.88 | 3.08 | Strongly Agreed |

| | | | | | | | |
|--------------------|---|-------------|-------------|-------------|-------------|-------------|------------------------|
| 12. | Exposing students to online platforms like Coursera, edX, and Khan Academy offer a wide range of courses to a global audience to foster learning interaction for and among students. | 3.29 | 0.70 | 3.25 | 0.70 | 3.26 | Strongly Agreed |
| 13. | Exposing to students to simulations and virtual laboratories to provide hands-on practice in a risk-free environment, crucial for fields like science, engineering, and medicine. | 2.84 | 0.94 | 2.80 | 0.98 | 2.81 | Strongly Agreed |
| 14. | Incorporating game elements such as points, badges, and leaderboards to motivate and engage learners' participation in the classroom. | 3.00 | 0.90 | 2.96 | 0.91 | 2.97 | Strongly Agreed |
| 15. | Modelling and utilizing artificial intelligence to tailor educational experiences to individual learners' needs, preferences, and progress. | 2.90 | 0.88 | 2.91 | 0.89 | 2.90 | Strongly Agreed |
| 16. | Effectively utilizing collaborative software such as Google Workspace and Microsoft Teams to facilitate real-time collaboration on projects and assignments | 3.33 | 0.77 | 3.31 | 0.75 | 3.32 | Strongly Agreed |
| 17. | Employing virtual and augmented reality (VR/AR) for immersive simulations that provide a realistic learning environment, useful for complex. | 3.42 | 0.78 | 3.42 | 0.77 | 3.42 | Strongly Agreed |
| 18. | Setting and preparing digital assessments in form of online quizzes, exams, and assignments that provide immediate feedback. | 2.88 | 0.83 | 2.94 | 0.83 | 2.92 | Strongly Agreed |
| 19. | Using software like Adobe Captivate and Articulate Storyline to create interactive educational content. | 3.42 | 0.60 | 3.39 | 0.66 | 3.40 | Strongly Agreed |
| 20. | Making use of ICT and social media networking like Zoom, Microsoft Teams, and Google Meet for live, interactive classes and meetings, YouTube and SlideShare to enable educators to share lectures, tutorials, and presentations, Edmodo and LinkedIn Learning. | 2.93 | 0.74 | 2.86 | 0.78 | 2.88 | Strongly Agreed |
| Grand Total | | 3.11 | 0.80 | 3.09 | 0.81 | 3.10 | Strongly Agreed |

The data in table 2 shows how technology-enhanced learning (TEL) can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State. The table also showed engaging students in learning management systems (LMS) like Moodle, canvas, and blackboard deliver course materials, track progress, and manage educational content for effective learning (Mean=3.08), exposing students to online platforms like Coursera, EDX, and khan academy offer a wide range of courses to a global audience to foster learning interaction for and among students (Mean=3.26), , effectively utilizing collaborative software such as google workspace and Microsoft teams to facilitate real-time collaboration on projects and assignments (Mean=3.32), using software like adobe captivate and articulate storyline to create interactive educational content (Mean=3.40), are the major ways technology-enhanced learning (TEL) be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State among other.

Ho1: There is no significant difference between the opinion mean ratings of teachers on how gamification can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State based on their teaching experiences.

Table 3: Summary of t-test on the difference between the opinions mean ratings of teachers on how gamification can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State based on their teaching experiences.

| Teachers Gender | N | Mean | SD | Df | t-test | Sig. | Remark |
|-----------------|-----|------|------|-----|--------|-------|--------|
| Male | 141 | 3.23 | 0.78 | 434 | 0.597 | 0.537 | NS |
| Female | 270 | 3.18 | 0.82 | | | | |

NS= Not Significant

Table 4: Summary of t-test on the difference between the opinion mean ratings of teachers on how technology-enhanced learning (TEL) can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State based on their teaching experiences.

| Teachers Gender | N | Mean | SD | Df | t-test | Sig. | Remark |
|-----------------|-----|------|------|-----|--------|-------|--------|
| Male | 141 | 3.11 | 0.80 | 434 | 0.247 | 0.805 | NS |
| Female | 270 | 3.09 | 0.81 | | | | |

NS= Not Significant

The table above showed the difference between the mean responses of male and female teachers on how technology-enhanced learning (TEL) can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State based on their teaching experiences. The mean response of male teachers is 3.11 and the standard deviation is 0.80, while the mean response of female teachers is 3.09 and the standard deviation is 0.81. The t-test calculated value is 0.239, the corresponded significance value is 0.805 showing > 0.05 at 409 degrees of freedom. Hence, it is concluded that there is no significant difference between the mean responses of male and female teachers on how technology-enhanced learning (TEL) can be integrated into modern classrooms for innovative pedagogies in public secondary schools in Bayelsa State based on their teaching experiences. Therefore, the null hypothesis two is retained at 0.05 level of significance.

Discussion of Findings

The study focused on integrating innovative pedagogies, creativity, and technology in modern classrooms of public secondary schools in Bayelsa State. the study revealed that the use of gamification in the classroom such like Quizlet, Seesaw, and interactive coding tools demonstrates how gamification can be incorporated into the learning process. These tools engage students by offering interactive study modes, digital portfolios, and games that reinforce learning. This approach not only makes learning enjoyable but also helps improve retention and skills application. Teachers can foster a more engaging and dynamic learning environment, encouraging students to actively participate in their education. On the other hand, applying Technology-Enhanced Learning (TEL) such as Moodle, Canvas, and Blackboard offer a structured and interactive approach to managing course materials, tracking progress, and promoting collaboration. The integration of global platforms like Coursera and Khan Academy

broadens access to diverse learning resources, allowing students to explore beyond the traditional curriculum. The use of collaborative tools such as Google Workspace and Microsoft Teams facilitates real-time communication and teamwork, enriching the learning experience and preparing students for a digital future. Further, the study revealed that there is no significant difference between the responses of male and female teachers regarding the integration of gamification into classrooms. This suggests that both genders, regardless of teaching experience, recognize the potential of gamification in enhancing student engagement and learning outcomes. It reflects a shared understanding of how innovative pedagogies can be effectively implemented in the classroom. Similarly, the study discovered that there is no significant difference between male and female teachers in their responses about the integration of technology-enhanced learning. This finding further supports the notion that both genders, regardless of teaching experience, acknowledge the role of technology in fostering interactive and effective learning environments.

Conclusion

Based on the analyzed data, the study concluded that integrating creativity and technology in modern classroom will enhance effective pedagogies and make the teaching process innovative. Hence, gamification and technologies enhanced-learning will impact and simplify learning for students.

Recommendations

Based on the findings of the study; the researcher hereby recommends that:

1. Teachers should blend their teaching styles to reflect innovativeness, since teaching and the society are dynamic and becoming more technological in nature.
2. While Government is expected to provide technological facilities in the school, other relevant agencies should intensify teachers' training in the use of technological gadgets, especially in education in order to position them for global competition.

References

- Bingimlas, K. (2009). Barriers to the successful integration of ICT in teaching-learning environments: A review of the literature. *Eurasia Journal of Mathematics, Science & Technology Education*, 5(3), 235-245.
- Bower, M. (2017). *Design of Technology-Enhanced Learning: Integrating Research and Practice*. Emerald Publishing.
- Cooper, J.R., (2022) multidimensional approach to the adoption of innovation, *Management Decision*, 6(8), 493-502.
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From Game Design Elements to Gamefulness: Defining "Gamification". Proceedings of the 15th International Academic MindTrek Conference: *Envisioning Future Media Environments*, 9-15.

- Domínguez, A., Saenz-de-Navarrete, J., de-Marcos, L., Fernández-Sanz, L., Pagés, C., & Martínez-Herráiz, J. J. (2013). Gamifying Learning Experiences: Practical Implications and Outcomes. *Computers & Education*, 63(2), 380-392.
- Garrison, D. R., & Kanuka, H. (2004). Blended Learning: Uncovering Its Transformative Potential in Higher Education. *The Internet and Higher Education*, 13(2), 95-105.
- González-Zamar, Mariana-Daniela & Abad-Segura, E. & Meneses, E. & Gómez G. (2020) Managing ICT for Sustainable Education: Research Analysis in the Context of Higher Education. *Sustainability*. 12, 22-35.
- Hamari, J., Koivisto, J., & Sarsa, H. (2014). *Does Gamification Work? – A Literature Review of Empirical Studies on Gamification*. Proceedings of the 47th Hawaii International Conference on System Sciences, 3025-3034.
- Huotari, K., Hamari, J. A. (2017). Definition for gamification: anchoring gamification in the service marketing literature. *Electron Markets* 27, 21–31. <https://doi.org/10.1007/s12525-015-0212-z>
- Majuri, J., Koivisto, J., & Hamari, J. (2018). *Gamification of Education and Learning: A Review of Empirical Literature. Strategies for Training and Education*. Pfeiffer, San Francisco, CA.