AVAILABILITY AND UTILIZATION OF DIGITAL STRATEGIES FOR PREVENTING EXAMINATION MALPRACTICE IN BIOLOGY EXAMINATIONS IN SENIOR SECONDARY SCHOOLS IN NSUKKA LOCAL GOVERNMENT AREA, ENUGU STATE

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Abstract
The study investigated the availability and utilization of digital strategies for preventing examination malpractice in biology examinations in senior secondary schools in Nsukka Local Government Area, Enugu state. It was guided by four specific purposes; and employed descriptive survey research design. 332 Biology students and 9 Biology teachers were sampled. Data were collected using face-validated checklist and rating scale; with reliability indices of 0.83, 0.81 and 0.76 ascertained using Cronbach Alpha. Data were analyzed using descriptive statistics. Results showed that digital strategies for preventing examination malpractice were not available except for biometric verification devices for candidates' identification. Also, digital strategies were used at low extent. Among the challenges limiting effective utilization of digital strategies for preventing examination malpractice were inadequate digital tools and insufficient training of Biology teachers on the use of digital strategies; while provision of sufficient digital equipment and organizing regular ICT training for teachers among others are solutions to the challenges identified.

Key words *Digital Strategies, Examination Malpractice, Biology, Utilization, Digital Literacy,*

Introduction
Examination malpractice has remained a persistent challenge in the educational system in Nigeria. This tends to reduce the credibility of certificates awarded, the quality of school leavers, and their competence in solving problems encountered in their environment. To reduce the menace in Nigeria, studies have been conducted on ways to reduce it (Gulee et al., 2025). Yet, issues of examination malpractice are still being observed during examinations such as biology across Nigeria, Sub-Saharan Africa

and globally (Okoye, et al., 2024; Mensah et al., 2026). For students to benefit from the objectives of biology taught across secondary schools, there is a need to prevent examination malpractice through authentic and reliable assessment's monitoring methods that involve the use of digital strategies (Ikwuobe & Michael, 2025). The study was considered necessary as it supports the Enugu Smart Green Schools Project which is an educational reform initiative of the Enugu State Government that aimed at transforming basic education through modern infrastructure, digital technology, practical skills, and environmentally sustainable facilities. Beginning such initiative from basic level will expose learners to sufficient digital literacy and provide requisite digital strategies for preventing examination malpractice across schools. In determining the digital strategies for preventing examination malpractice in Biology examinations in senior secondary schools, the researchers investigated the extent of their availability, utilization, challenges and possible solutions.

Biology is the scientific study of living things and their interactions at microscopic and macroscopic levels. It is the scientific study of life and living organisms, including their structures, functions, growth, evolution, and distributions (Alberts et al., 2015; Urry et al., 2020). Biology explores life from molecules to ecosystems, integrating fields such as genetics, physiology, ecology, and microbiology to explain both the diversity and unity of living systems (Freeman et al., 2018; Hillis et al., 2021). Biology is operationally defined as a school subject that deals with the study of living organisms and their interactions with their environment; measured through students' performance, skills acquisition as well as possession of desirable attitude. The relevance of biology is enormous. It prepares students to choose careers in medicine, agriculture, and biotechnology thereby, solving global challenges, maintaining food security, ensuring environmental sustainability as well as contribute to societal well-being and national development (Ahmad et al., 2018; Alberts et al., 2015; Hillis et al., 2021). Additionally, understanding biological principles among other things informs public policy and conservation efforts thereby shaping how societies respond to biodiversity loss, health crises, climate change and other environmental issues. Biology as a subject is broad and conceptually demanding. Thus, requires both theoretical understanding and practical competence. Students' cognitive abilities in Biology are tested in examinations.

Biology examinations are formal assessment procedures designed to evaluate students' knowledge, understanding, practical skills, and competencies among others acquired through the study of biology. Examinations serve as an essential component of the educational process because they provide a means of determining the extent to which instructional objectives have been attained. In secondary schools, biology examinations assess students' mastery of biological concepts, principles, theories, practical activities, and their ability to apply scientific knowledge to real-life situations (Aina & Adedo, 2021). Thus, Biology examinations are structured to measure cognitive, psychomotor, and affective learning outcomes. The cognitive domain focuses on students' understanding of biological concepts and their ability to recall, explain, analyze, and evaluate scientific information. The psychomotor domain assesses practical laboratory skills such as observation, experimentation, specimen identification, data collection, and interpretation. The affective domain evaluates students' honesty in reporting experiments, attitudes, interests, and appreciation of biological phenomena (Ogunleye & Babajide, 2020). Across the levels of senior secondary schools, biology examinations are being conducted.

Biology examinations in Nigerian secondary schools are conducted at different levels for different purposes. Internal examinations are organized by schools to monitor students' academic progress and provide feedback on teaching and learning effectiveness. Examination results give evidence of students' areas of strengths and weaknesses which help teachers to ascertain if students require improvement or remedial teaching. External examinations, on the other hand, are conducted by recognized examination bodies such as the West African Examinations Council and National Examinations Council among others. These examinations are used for certification, placement into higher institutions, and evaluation of educational standards across schools and regions (Akinbobola & Afolabi, 2022). The format of biology examinations includes but not limited to multiple choice questions, essay questions, and practical examinations. Multiple choice questions are designed to test a wide range of content within a limited period and are usually scored objectively. Essay questions assess students' ability to organize ideas, explain biological concepts, and demonstrate critical thinking skills. Practical examinations evaluate students' competence in laboratory activities, specimen identification,

experimental procedures, and interpretation of biological data. The inclusion of practical components reflects the nature of biology as an experimental science and ensures that students acquire hands-on scientific skills alongside theoretical knowledge (Adamu & Olatunji, 2021). Biology examinations serve as gateway to educational and career advancement as well as provide basis for evaluating instructional effectiveness. Despite their importance, biology examinations face numerous challenges in secondary schools among which is examination malpractice.

Examination malpractice is any willful misconduct or violation of established examination rules and regulations which can be before, during, or after an examination with the purpose of obtaining unmerited advantage or influencing examination results. Examination malpractice is any intentional act of wrong-doing that contravenes the rules of examinations, geared towards giving an unfair advantage to a candidate (Okoye, et al., 2024). It involves any behaviour that introduces doubt about the credibility and integrity of the examination process. It can be perpetrated by students, teachers, school administrators, invigilators, examination officials, parents, or other stakeholders in education (Adewumi & Akinnodi, 2022). Examination malpractice has become one of the most critical challenges bedeviling the education sector across the world, particularly in developing countries (Okoye, et al., 2024; Mensah et al., 2026). In Nigeria, the problem appears to have assumed disturbing status and continues to jeopardize the credibility of educational assessment and certification. It can manifest in different ways.

A common form of examination malpractice is copying from other candidates during examinations. This occurs when students exchange answers, communicate secretly, or deliberately exposing their answer scripts to others. There is also impersonation; whereby an individual sits for an examination on behalf of a registered candidate. Impersonation is most times arranged through collaboration between candidates and external agents determined to obtain examination success through deceitful means (Ayoade & Agboola, 2022). Leakage of examination questions is another common form of examination malpractice. It occurs when examination questions are revealed to candidates before the scheduled examination time. Such leakages may originate from examination officials, printers, supervisors, or other individuals who have access to examination materials

that are meant to be confidential. Another widespread practice is the use of unauthorized materials such as textbooks, notebooks, prepared notes, electronic devices, mobile phones, programmable calculators, or other prohibited materials during examinations. In some cases, invigilators, supervisors, teachers, or even school administrators deliberately offer assistance to students by providing answers, overlooking cheating activities, or allowing unauthorized assistance during examinations. Such practices make examination malpractice be perceived as 'normal' across schools. In recent times where information communication and technology (ICT) tools are prevalent, candidates tend to resort to the use of android phones, smart phones and other digital means to perpetuate examination malpractice. These practices weaken public confidence in educational assessment systems (Awolola & Oketunbi, 2021). Several factors contribute to the prevalence of examination malpractice.

Among the factors is the societal emphasis on certificates instead of knowledge, skills acquisition, and competence. Yaya et al. (2024) averred that poor students' attitude towards their studies fuels the prevalence of examination malpractice in schools. In some cases, academic qualifications are regarded as the yardstick and the main condition for employment, promotion, and social recognition.Some students therefore, resort to fraudulent means to get high grades and certificates without considering their actual level of competence. Other factors are parental influence, poor study habits, ineffective teaching methods, inadequate instructional materials, overcrowded classrooms, and insufficient laboratory facilities may hinder effective learning and encourage students to seek alternative means of achieving examination success (Owor & Owor, 2021). The consequences of examination malpractice are diverse and affect individuals, institutions, and society at large.

A significant consequence is the turning out of school leavers who possess certificates but lack the content knowledge, skills, and requisite competencies for professional practice. When students succeed through educational levels using dishonest examination results, the quality of human resources available for national development becomes compromised (Kumo et al., 2023). Thus, employers of labour, tertiary institutions, non-governmental and international organizations tend to have doubts in such academic qualifications. Such an ugly situation drags the reputation of

educational institutions to the mud (Abiodun-Oyebanji, 2014). It is therefore, necessary to prevent examination malpractice.

Prevention of examination malpracticeinvolves measures or actions adopted by stakeholders in education to reduce or totally eradicate the incidence of malpractice before, during and after an examination. Some of the widely used conventional strategies of preventing examination malpractice are strict invigilation during examinations that involves close monitoring and supervision of candidates by appointed officials throughout the examination period (Owolabi & Adepoju, 2022); proper seating arrangement in examination halls and arranging candidates in a manner that minimizes opportunities for cheating (Afolayan & Adebisi, 2020); enforcement of examination rules and regulations by educational institutions and examination bodies (Nwosu & Uche, 2021); ethical education has also been recognized as it seeks to address the underlying attitudes and beliefs that motivate students to engage in examination practices ((Abiodun-Oyebanji, 2014); use of continuous assessment helps to reduce dependence on final examinations (Ajayi & Olatoye, 2020); training and retraining of examination personnel (Musa & Garba, 2022); as well as through the use of multiple versions of the question papers (Bello & Ismail, 2021). Additionally, providing conducive examination environments helps to minimize examination irregularities (Onah & Eze, 2022). Parents, community leaders, religious leaders, and civil society groups are not left out as they can promote values of honesty, integrity, and accountability among young people (Umar & Hassan, 2023). Despite their importance, conventional ways of preventing examination malpractice have their limitations as they rely totally on human supervision, which is frequently vulnerable to errors, bias, and corruption. These limitations have necessitated the exploration of innovative and technology-driven solutions capable of enhancing examination security and reducing opportunities for malpractice (Yakubu & Alabi, 2024; Gulee, 2025). Hence, the need for the utilization of digital strategies of preventing examination malpractice.

Utilization of digital strategies for preventing examination malpractice is the application of digital technologies, electronic means, and online tools to detect, monitor, reduce, and prevent cheating and other forms of misconduct before, during and after examination. The use of digital strategies is important as they eliminate impersonation, minimize

opportunities for question leakage, unauthorized access to examination materials, manual manipulation of results as well as strengthens examination security that enhances confidence in the credibility of examination outcomes (OECD, 2023). Common available and adopted digital strategies at higher institutions of learning are Computer-Based Testing (CBT) and use of biometric verification systems (Isabu & Asemhokhai, 2024;Ikwuobe & Michael, 2025). However, Nwana et al. (2017) reported that majority of the resources are not used by teachers. The use of digital strategies for preventing examination malpractice could be crippled by some challenges.

Challenges in this context, are difficulties that hinder effective use of digital technologies in preventing examination malpractice. Wami and Wami (2022) revealed that the constraints to the use of information and communication technology (ICT) in Nigerian secondary schools in the 21st century are inadequate power supply, insufficient computer laboratories, high student–computer ratio, poor internet connectivity, and limited ICT training for both staff and students.It is not enough to identify the challenges but to proffer solutions which are measures taken to overcome the difficulties associated with using digital technologies to prevent examination malpractice. Gulee (2025) reported that increasing the penalties for examination malpractice, improving invigilators training, using biometric, identification, installing CCTV cameras in examination halls are some of the effective solutions to examination malpractice. Most of these studies were in higher institutions of learning and colleges of education with limited emphasis on secondary schools. There are variations in study areas and disciplines. Moreover, there could be other digital strategies, challenges and solutions apart from the ones mentioned above. This study therefore investigated digital strategies for preventing examination malpractice in senior secondary schools in Nsukka Local Government Area with emphasis to determining the:

1. availability of the digital strategies for preventing examination malpractice among Biology students;
2. extent of utilization of the digital strategies for preventing examination malpractice among Biology students;
3. challenges to effective utilization of the digital strategies for preventing examination malpractice among Biology students; and
4. solutions to the challenges.

Theoretically, the study was linked to the Deterrence Theory of Cesare Beccaria interpreted by Paolucci (1963). Deterrence theory states that individuals are less likely to engage in deviant or criminal behaviour when they perceive that the tendency of detection is high and the punishment is certain, rapid, and severe. As such, human actions are guided by rational choice, where individuals weigh the potential benefits of misconduct against the possible consequences before deciding to act. The Deterrence theory relates to this study in that the use of digital strategies tends to promote the likelihood of detecting/catching students who engage in examination malpractice, thus, making students less likely to engage in it as the theory upholds.

Method

This study adopted a descriptive survey research design. It was carried out in senior secondary schools in Nsukka Local Government Area of Enugu State, Nigeria. The population of the study comprised 2,317 respondents (2,258 senior Secondary School two (SS2) Biology students and 59 Biology teachers). The study has 341 participants computed using the Taro Yamane (1967) formula. The sample size was drawn using proportionate stratified random sampling technique. Consequently, 332 SS2 Biology students and 9 Biology teachers were drawn from nine public secondary schools in Nsukka Local Government Area using the simple random sampling technique by balloting without replacement. From each of the nine schools, a biology teacher and one intact science class was used, making a total sample of 341 participants.

The instruments for data collection were a checklist and a rating scale developed by the researchers based on the objectives of the study. The checklist was titled "availability of digital strategies for preventing examination malpractice checklist (ADSPEMC)" while the rating scale was titled "Utilization, Challenges and Solutions to Effective Utilization of Digital Strategies Scale (UCSEUDSS). Both instruments have two sections: A and B. Section A solicits the demographic information of the respondent such as the status of the respondents as either a teacher or student. Section B of the checklist examines the availability of digital strategies for preventing examination malpractice in biology examinations. It has two response options of available (A) and not available (NA). The section B of the rating scale was divided into three clusters, I - III. Cluster I was on

utilization of digital strategies in preventing examination malpractice, Cluster II was on challenges affecting the effective utilization of digital strategies while Cluster III focused on solutions to challenges affecting the utilization of digital strategies of preventing examination malpractice. A four-point modified Likert type response options of very high extent (4), high extent (3), low extent (2) and very low extent (1) were used for cluster I while strongly agree (4), agree (3), disagree (2), strongly disagree (1) were used for clusters II and III.

The instruments were face-validated. To determine the reliability of the instrument, a pilot study was conducted using 30 respondents comprising 29 SS2 biology students and one (1) biology teacher from a secondary school outside the study area. The responses obtained from the pilot study were subjected to reliability estimate using the Cronbach Alpha method. A reliability coefficient of 0.83, 0.81, and 0.76 were obtained for clusters I, II and III respectively and an overall reliability index of 0.80 was obtained. The indices were acceptable to the researchers as they show the instrument was reliable.

The researchers with the help of four research assistants administered the checklist and rating scale to respondents in their respective schools after establishing the ethical procedure. The instruments were distributed and retrieved on the spot. The data collected were analyzed using descriptive statistics percentages, mean, and standard deviation. A benchmark of 50% was used for the checklist items, while for the items on a 4-point scale, it was 2.50.

Results

Table 1: Availability of Digital Strategies for Preventing Examination Malpractice in Biology Examinations

S/N	Items (Strategies)	FoA	% A	FoNA	% NA
1.	Computers for conducting Biology examination.	168	49.3	173	50.7
2.	CCTV camera in examination hall.	139	40.8	202	59.2
3.	Biometric verification devices for candidates' identification.	208	61.0	133	39.0
4.	Computer-based testing facilities.	141	41.3	200	58.7
5.	Digital attendance systems during examinations.	138	40.5	203	59.5
6.	Internet facilities for examination monitoring	130	38.1	211	61.9
7.	Examination monitoring software.	156	45.7	185	54.3
8.	Mobile signal detection/blocking devices during examination.	127	37.2	214	62.8

FoA= Frequency of Availability; % A= Percentage Availability; FoNA= Frequency of Non-Availability; % NA= Percentage Non-Availability

Table 1 above revealed that the digital strategies for preventing examination malpractice in Biology examination are not available for use in public secondary schools.as indicated by the low response to almost all the items with Means below the established 50%.

Table 2; Extent of Utilization of Digital Strategies for Preventing Examination Malpractice in Biology Examinations

S/N	Items (Strategies)	N	Mean	Std. Deviation	Decision
1.	Computers for conducting Biology examination.	341	1.72	.78	Low Extent
2.	CCTV camera in examination hall.	341	1.60	.69	Low Extent
3.	Biometric verification devices for candidates' identification.	341	2.98	.32	High Extent
4.	Computer-based testing facilities.	341	1.68	.70	Low Extent
5.	Digital attendance systems during examinations.	341	1.60	.71	Low Extent
6.	Internet facilities for examination monitoring	341	1.67	.69	Low Extent
7.	Examination monitoring software.	341	1.55	.66	Low Extent
8.	Mobile signal detection/blocking devices during examination.	341	1.62	.63	Low Extent
	Cluster I		**1.77**	**.30**	**Low Extent**

Table 2 revealed that the digital strategies are used to a low extent in public secondary schools as their mean scores are below 2.50 set as criterion mean, the only exception is biometric verification. Their small standard deviation scores indicate that the responses of the respondents are relatively consistent.

Table 3: Challenges to Effective Utilization of Digital Strategies for Preventing Examination Malpractice in Biology Examinations

S/N	Item Statement	N	Mean	Std. Deviation	Decision
9.	Inadequate security of school properties.	341	3.46	.51	Agree
10	Inadequate digital tools/facilities.	341	3.94	.24	Agree
11	Irregular power supply.	341	3.46	.49	Agree
12	Insufficient technical support	341	3.95	.24	Agree
13	Insufficient training of Biology teachers on the use of digital strategies for preventing examination malpractice	341	3.96	.22	Agree
14	Poor internet connectivity/subscription	341	3.45	.50	Agree
15	High cost of maintenance of digital tools.	341	3.96	.19	Agree
16	Poor attitude towards the adoption of digital tools.	341	3.96	.18	Agree
	Cluster II	**341**	**3.77**	**.21**	**Agree**

Table 3 above revealed that items 9-16 are the challenges to effective utilization of digital strategies in preventing examination malpractice in Biology examination in public secondary schools as their mean scores are above 2.50 set as benchmark. The little standard deviation scores suggest that the responses of the respondents are relatively alike. The cluster mean score of 3.77 explicates that the respondents generally agreed that the items are the challenges to the utilization of digital strategies for preventing examination malpractice in Biology examination in public secondary schools. The low cluster standard deviation score of 0.21 reveals similarity in the participants' responses.

Table 4: Solutions to the Challenges to Effective Utilization of Digital Strategies for Preventing Examination Malpractice in Biology Examinations

S/N	Item Statement	N	Mean	Std. Deviation	Decision
1	Improving security of school properties.	341	3.45	.52	Agree
1	Provision of sufficient digital equipment (CCTV camera, mobile signal detection etc) across public secondary schools.	341	3.46	.51	Agree
1	Ensuring stable electricity with alternative power sources across public secondary schools.	341	3.43	.54	Agree
2	Posting of qualified technical personnel to public secondary schools.	341	3.51	.51	Agree
2	Organizing regular ICT training for teachers.	341	3.05	.22	Agree
2	Ensuring free internet connectivity/subscriptions in public secondary schools	341	3.03	.23	Agree
2	Provision of adequate funding for the maintenance of digital tools across public secondary schools.	341	3.04	.21	Agree
2	Developing positive attitude towards the adoption of digital tools	341	3.53	.51	Agree
	Cluster III	**341**	**3.31**	**.08**	**Agree**

Data in Table 4 reveal the suggested solutions to the challenges to effective utilization of digital strategies in preventing examination malpractice in Biology examination in public secondary schools with mean scores above the 2.50 set benchmark. The small standard deviation scores suggest that the responses of the respondents are relatively identical.

Discussion

Availability of Digital Strategies for Preventing Examination Malpractice in Biology Examinations

The results in Table 1 reveals non-availability of digital strategies for preventing examination malpractice in public secondary schools except for biometric verification devices for candidates' identification. This non-availability of digital strategies for preventing examination malpractice is likely to affect examination integrity in secondary schools within the study area. The non-availability status also suggests that secondary schools are yet to understand the capabilities of digital strategies as important mechanism for strengthening examination security and reducing opportunities for malpractice. The finding disagrees with Isabu and Asemhokhai (2024) that the common available and adopted digital strategies is Computer-Based Testing (CBT). This could be because their study was in higher institution of learning while the present study is in secondary school.

The biometric verification devices for candidates' identification are considered available because students are already aware that during registration for external examinations such as West African Senior School Certificate Examination and Senior School Certificate Examination, biometric verification machines are made available in all schools to ensure biometric verification commonly called thump printing. Making digital strategies available in secondary schools ensures adequacy of appropriate digital safeguards in schools that control unauthorized access, monitor the conduct of examination, confirm students' candidacy and ensure the security of examination materials.

Extent of Utilization of Digital Strategies for Preventing Examination Malpractice in Biology Examinations

The findings on the extent of utilization of digital strategies for preventing examination malpractice in Biology examinations show low utilization except for biometric verification devices for candidates' identification. It simply suggests that prevention of examination malpractice across secondary schools have not gone beyond the use of the conventional strategies; and they are yet to effectively apply the digital strategies. Such a gap arises because of non-availability of digital strategies; and perhaps

insufficient digital skills among biology teachers and examination personnel. The low utilization of digital strategies also indicates that rapid monitoring, controlled access, digital assessment environment, and improved accountability expected in secondary schools' Biology examinations may not be sufficiently guaranteed. Thus, increasing the persistence of examination malpractice in Biology examinations. The finding corroborates Nwana et al. (2017) that majority of the resources are not used by teachers.

Challenges to Effective Utilization of Digital Strategies for Preventing Examination Malpractice in Biology Examinations

The finding shows the challenges are not only non-availability of digital strategies for preventing examination malpractice or irregular power supply but also other bottlenecks that may include poor teacher knowledge and lack of digital skills. The stated challenges will affect the sustainable implementation of digital strategies for preventing examination malpractice in Biology examinations. The stated challenges will affect the sustainable implementation of digital strategies for preventing examination malpractice in Biology examinations. This is in line with Wami and Wami (2022) that the constraints to the use of information and communication technology (ICT) in Nigerian secondary schools are inadequate power supply, poor internet connectivity, and limited ICT training for both staff and students.

Solutions to the Challenges to Effective Utilization of Digital Strategies for Preventing Examination Malpractice in Biology Examinations

The findings on solutions to the challenges limiting effective utilization of digital strategies in preventing examination malpractice in biology examinations provide a useful direction for improving the utilization of digital strategies in preventing examination malpractice. The unanimous agreement of the respondents that organizing regular ICT training for teachers among others are consistent with the findings of Gulee (2025). Thus, Biology teachers as well as examination personnel need to complement effective supervision, sound examination practices and academic integrity with continuous ICT training to confidently utilize digital strategies in preventing examination malpractice across secondary schools; thereby sharpening their digital literacy.

Linked to this study is the fact that digital literacy is beyond simpler or more complex operations of a computer, mobile device or digital tool (Biezā, 2020) but involves the ability to use digital systems properly, maintain academic integrity, protect information, understand digital security measures, recognize unacceptable digital behaviour as well as ethical use of technology. Thus, promoting Biology students and teachers' digital literacy is necessary for their handling and monitoring of digital assessment, manage electronic examination materials, identify possible technological weaknesses and respond correctly to irregularities during examinations.

Conclusion

The persistence of examination malpractice in biology examinations across public secondary schools is attributed to failure of teachers and examination personnel to complement the conventional ways of preventing examination malpractice with the digital strategies. From the findings and discussion, it can be concluded that digital strategies for preventing examination malpractice in Biology examinations are not available in secondary schools; they have low extent of utilization; and cannot prevent examination malpractice in Biology examinations without their effective utilization propelled by tackling the identified challenges via the solutions suggested.

Recommendations

Based on the findings the following recommendations are made:

1. Government and non-governmental organisations should make digital strategies such as CCTV cameras and mobile signal detection among others available for preventing examination malpractice in secondary schools. This ensures effective utilization, examination integrity and global competitiveness.
2. Providing alternative electricity sources should be prioritized by the state government with stable internet connectivity since the effectiveness of many digital strategies depends on stable access to power and network services.
3. Continuous capacity-building trainings should be organized by the Education Authorities for Biology teachers and students not only on basic computer operation but also on the practical use of digital strategies for preventing examination malpractice.

4. State Ministry of Education in Enugu should develop clear policies guiding the use of digital strategies during examinations. These policies are expected to specify those technologies that may be acceptable or not for monitoring examinations, and sanctions for violations.

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