ERADICATING EXAMINATION MALPRACTICE IN PHYSICS EDUCATION BY MANIPULATING THE KEY ELEMENTS OF THE CURRICULUM PROCESS: IMPLICATION FOR TECHNOLOGICAL ADVANCEMENT

By

Akpakpan O. Udoh
Head of Department of Science,
St. Mary's Science College,
Abak, Akwa Ibom State.

Abstract

The paper examines the various forms of examination malpractice; its causes, perpetrators and growing menace. It observes that it makes nonsense of physics education, militating against the country's pursuit of technological advancement. It believes that the menace can be tamed by manipulating or rebranding the four key elements of physics curriculum process, viz: the curriculum, instructional materials, the students and the teacher. It views the theoretical component of WAEC/NECO SSCE physics curriculum as superfluous, and adjudges the practical facet as inadequate. Accordingly, it advocates the pruning out of "electrical conduction through liquids and gases" and recommends the incorporation of elementary experiments (practicals) in sound waves and viscosity. Further, the paper advocates the enthronement of the culture of improvisation of instructional materials, and the recognition/celebration of excellence in teaching and learning.

Webster's Universal Dictionary and Thesaurus (2005) defines physics as the branch of science concerned with matter and energy and their interactions in the fields of mechanics, acoustics, optics, heat, electricity, magnetism, radiation, atomic structure and nuclear phenomena. It is alleged (Isaac 2000) to be the study of the laws that determine the structure of the universe with reference to the matter and energy of which it consists; and that it is concerned not with chemical changes that occur but with the forces that exist between matter and energy.

According to Coletta (1995), knowledge of physics allows you:

- To begin to appreciate the diverse phenomena of the world in a new, more unified way, to see a world governed by physical principles, and to understand how these

principles serve as a foundation for understanding other sciences such as biology and chemistry.

- To be able to apply the principles of physics to solutions of problems and to understand how physical principles have been used to solve enormous technical problems, opening up new vistas of experience of the physical universe undreamt of 50 to 100 years ago – space exploration, lasers, electron microscopes, computers, memory chips, magnetic resonance imaging and so on.

Young and Freedman (1996) averred that "Scientist of all disciplines make use of the ideas of Physics…Physics is the foundation of all engineering and technology" (p.1). Thus, if properly implemented, physics education is unarguably the hub of technological advancement in Nigeria. Tyler (cited in Onwuka 1991, p.33) asserted that implementing (physics education) curriculum is essentially giving answers to four fundamental questions, in the following sequence.

- What educational purposes should the school seek to attain? This pertains to definition of educational objectives
- What educational experiences can be provided that are likely to attain these purposes? This refers to content or subject matter.
- How can these educational experiences be effectively organized? This concerns method of instruction, including the utilization of instructional materials.
- How can we determine whether these purposes are being attained? It is by means of appropriate evaluation that the success or failure of educational endeavours can be determined.

From the afore-going realities of curriculum implementation, it is alleged that "Evaluation of the curriculum, when properly conceptualized and implemented; seems to be the hub of the curriculum process" (Esu, Enokoha and Umoren 2004, p.53). Implicit in this quotation is the need for credible examination and, the benefits of examination ethics.

Concepts and Forms of Examination Malpractice

Examination Malpractice Act (1999) defines examination malpractice as:

> Any act of omission or commission by a person who in anticipation of, before, during or after any examination, fraudulently secures any unfair advantage for himself or any person in such a manner that contravenes the rules and regulations to the extent of undermining the validity, reliability, authenticity of the examination and ultimately the integrity of the certificates issued.

To Argungu (1997), cited in Adamu (2001), it is any irregularity which is premeditated and perpetrated by candidates or their agents with the intention of gaining undue advantage over others in an examination. According to Adesina (2005), examination malpractice rears its ugly head in forms which include, leaking out question papers to students, buying and selling of question papers and prepared answers, giraffing in examination hall, smuggling of materials into examination hall, deliberate extension of time by supervisors/invigilators and trading sex for

marks/grades. Magaji (2006) identified multiple entry for the same examination, bribery, spying, impersonation, submission of multiple scripts, mass cheating, assault on supervisors/invigilators, as forms of examination malpractice. Onyechere (1996) extended the list to include sale of blank answer sheets, collusion between candidates, collusion between candidates and officials, whispering in examination hall, hi-tec malpractice and substitution of answer sheets.

Causes/Perpetrators and Dangers of Examination Malpractice

Seen as a malignant disease and a national disaster in our educational sector, its causes include: general laziness, absence of hardwork, candidate's inadequate preparation for examination, poor teaching method, greed on the part of teachers and school authorities, teachers poor self-image. Other factors include, poor remuneration for teachers, congestion in examination hall, improper supervision/invigilation, lack of facilities (such as laboratories and laboratory instruments) and paucity of professionally trained teachers.

Jostled by the alarming proportion assumed by this monster of examination malpractice, scholars (Abbas 2006, Onyechere 1996) have researched and identified perpetrators of this terrible crime. Their findings are heart-bleeding. Examination malpractice is perpetrated by all stake holders in the education sub-sector, viz students, teachers, parents (guardians, school authorities and the society). Others include: education inspectors, government, staff of examination bodies, supervisors/invigilators, law enforcement agents and some members of the clergy. But why is the phenomenon of examination malpractice so heart-rending? Here is the answer: Onyechere (1997) warned that:

> *Giving this monster free reign tantamounts to supporting an enabling environment whereby future leaders, doctors, civil servants, bankers, politicians, accountants, journalists, professors are forged on the fraudulent foundation of examination malpractice. This has serious social, political and economic consequences not just for our country but for the world at large (p.5).*

The scenario is indeed alarming. Of all the stakeholders of the education industry, those of physics education must take the lead to raise the alarm, and denounce examination malpractice as having serious social political and economic consequences not only for our country but for the world at large. This is the reason: given that physics is the most fundamental of the sciences, permeating all facets of lives, is a compelling pointer to the fact that to achieve the objectives of building a vibrant, technologically-driven society, the battle against examination malpractice in physics education must first be fought and won. Of course, technology can neither be implanted nor transplanted through an educational process whose evaluation system is riddled with fraud, which is one of the greatest manifestations of indiscipline and laziness. Rather, technological successes are anchored on sustained hardwork, having recourse to a synthesis of energy of courage, commitment, discipline and integrity. Our dependency

on external technology is due to our inability to purge out the menace of examination malpractice.

Eradicating Examination Malpractice in Physics Evaluation

> *Basically four elements are required in any teaching/learning situation, be it science or non-science. These are: the teaching curriculum in the area of study, the teacher to teach, the availability of instructional materials/facilities and the students to be taught (Eshiet 1996, p.9).*

Implicit in this quotation is that a deadly blow can be dealt on the monster of examination malpractice by rebranding or manipulating the four elements – the curriculum, instructional materials, students and teachers – and this is the way forward in physics education.

The Teaching Curriculum Factor

The theoretical aspect of WAEC/NECO SSCE physics curriculum is superfluous. Prune out "electrical conduction through liquids and gases". The practical facet is inadequate. Maintain the routine, monotonous experiments in mechanics, optics, current electricity and heat. Now,

- Step up experiments in heat and ensure regular occurrence of heat experiment in SSCE examinations.
- Introduce elementary experiments (practicals) in sound waves such as experimental determination of the velocity of Sound in air, or frequency of a tuning fork, using resonance tube and tuning fork(s).
- Incorporate experiments on determination of terminal velocity of a ball-bearing falling through a viscous liquid. The aim is to multiply acquisition of science process skills, namely (Landu 2006, p.112) observing, classifying, measuring, interpreting data, and higher order process skills such as "communicating, inferring, predicting, making operational definitions, hypothesizing, experimenting and formulating models" (Nwana 2000, p.8). Acquisition of these skills presupposes intellectual integrity of the highest order; accordingly, it is exam-ethics friendly. In contrast, non-acquisition of required science process skills has a serious implication for examination ethics. How? Basically, examination, whether in science or non-science subjects, tends to focus on students' cognition; that is, it concentrates on acquisition of skills in interpreting, classifying, remembering information, evaluating ideas, inferring principles, deduction of rules and imagination of possibilities. The psychological tremor of expected failure or scoring low grade, due to non-acquisition of expected science process skills, can generate excessive level of anxiety; and this will pave the way for students' indulgence in examination malpractice.

Instructional Materials Factors

Instructional materials are resources whose primary functions are to facilitate the teaching and learning of skills, facts, concepts, principles, generalizations, values, and attitude in science (Otuka 2000a). Educational values of instructional materials are

enormous. They promote meaningful communication, help in arousing, and holding attention of learners and motivating them to learn. Thus, teachers should integrate instructional materials in teaching in order to engage, strengthen and sustain the reading habit of students.

Incidentally, owing to the fact that Physics laboratories in Nigeria are generally poorly resourced in terms of availability and adequacy of instructional materials, the term 'improvisation" has been added to the literature in physics education. By definition, "improvisation is the act of using alternative materials/resources, due to lack or insufficiency of some specific first-hand teaching aids, to facilitate instructions" (Otuka 2000b, p.205). The term "improvisation concerns a creative and innovative development of substitute equipment and materials to enhance teaching effectiveness when known standard equipments or materials are unavailable, unaffordable or in short-supply" (Eshiet 1993, p.100).

Improvisation removes boredom, encourages practicality, enhances creativity and productivity, and inspires confidence in both the teacher and the taught. They ensure better retention and makes learning more permanent. It encourages active students-participation; if they (students) are allowed to manipulate/improvise the materials. The physics teacher is expected to encourage social participation by creating small groups in certain laboratory classes. While the students work in groups and share materials (improvised and/or standard), the teacher co-ordinates and provides guidance. This is paying attention to the four pillars of learning, viz; learning to know, learning to do, learning to be and learning to live together. It is making the students self-reliant. Ingenious teachers are, therefore, expected to take up the challenge to readily modify, design, create or produce cheap materials (and to motivate students-made instructional materials) for teaching/learning exercises.

The Student-Factor

The student-factor in the teaching/learning process assumes the position of a benefiting end in educational practices. At the entry point of formal education, they are expected to be of high quality to reap lasting benefits. That is, they should meet the expected standard of the level or class which they are enrolled. This demands that a (physics) student should not be promoted to the next level if he/she is of inadequate, or poor, standard. Promoting substandard students constitutes the building blocks of indiscipline and cheating in examination.

The Teacher-Factor

The teacher-factor is dominant, occupying the position of a controlling element in the four basic elements of curriculum process (Eshiet 1996, P. 10). The implication is that he (the teacher) is the controlling or deciding factor in the life and death of examination malpractice. Put in a military parlance: teachers are the foot soldiers of a war against the monster, the canker of examination malpractice. The infantrymen are strategically designed for direct exposure to the theatre of operations. They (the infantrymen) are to kill, or be killed, to end the battle. In this case, teachers must be

colourfully arrayed in an armour of unquestionable integrity; they must rise to consume the monster, no option, to restore the validity and reliability of our cognitive measures. This is the much needed sanity in the education sub-sector.

In practical terms, successful manipulations of the physics teacher to sanitize physics education depends on the extent to which we are prepared to take the following proactive, collaborative steps:

- Ensuring availability of quality teachers in physics education
- Actively participating in Junior Engineers, Technicians and Scientists (JETS) competitions
- Actively participating in Science Teachers Association of Nigeria (STAN) competitions.
- Instituting JETS and STAN award for excellence
- Paying priority attention to welfare of (physics) teachers.

Ensuring Availability of Quality Teachers in Physics Education: The Federal Government of Nigeria believes that "no education system may rise above the quality of its teachers" (Federal Republic of Nigeria 2004, p.39). Incidentally, many physics teachers, today, are untrained professionally, and are of poor quality. They cannot, therefore, impart the right skills, knowledge and scientific attitude. For quality assurance, a mandatory in service, professional training, with pay, is recommended for all untrained physics teachers. There should be a systematic attention to update the teachers' professional knowledge and scientific attitudes in the light of changes in the curriculum and the wider society. Curriculum implementation, devoid of examination malpractice, is possible, only through the instrumentality of high quality teachers. Beyond this, quality assurance demands a regular exposure of every physics teacher to a mandatory integrity training programme to defend and promote the ethics and integrity of public examinations.

Actively Participating in (JETS and STAN) Competitions: Inauguration of JETS and STAN clubs in every secondary school should be mandatory. The physics teacher should always see himself as being saddled with the responsibility to lead a team of motivated and enthusiastic students to initiate, complete and exhibit prize winning physics project at JETS and STAN conferences, as well as raising a class of gifted students for school challenge (quiz) competitions at the local, state and national levels .These competitions aim at promoting the teaching/learning of science, as well as the spirit of sportmanship and healthy competitions for academics laurels among students. The projects so completed and exhibited enhance entrepreneurial skills, a step in the direction of technological development. It is an effective antidote to examination malpractice.

Instituting JETS and STAN award for Excellence: For both JETS and STAN Competitions, prizes should be awarded to winners at the grand finale/state stage of the quiz/project competitions as follows:

1st prize School: gift worth ₦250,000.00;
Student: ₦70,000.00 cash; Teacher 50,000.00 cash

2nd prize School: gift worth ₦180,000.00
Student: ₦50,000.00 cash; Teacher ₦40,000.00 cash

3rd prize School: gift worth ₦100,000.00
Student: ₦30,000.00 cash; Teacher ₦30,000.00 cash

Three (3) consolation prizes:
School: gift worth ₦20,000.00 each
Student: ₦10,000.00 cash; Teacher ₦ 30,000.00 cash

But caution! prizes so awarded have taken cognizance of the teacher, who guides and leads the prize-winning students. Ignoring the teacher in the award (as is often the case) tends to demotivate him, creating a pinhole through which examination malpractice can eventually peep.

Paying Priority Attention to Teacher's Welfare: Paying priority attention to the welfare of teachers will result in a sustained success in the fight against the menace of exanimation malpractice. Attractive remuneration for teachers, Provision of modest Staff quarters, including housing/car loans, etcetera, will constitute effective measure. The class room teacher must be so 'rebranded' or 'repositioned' as a man of no mean significance, to upturn the canker of exanimation malpractice, and enthrone the culture of hard work with its attendant enduring and lasting success.

In the case of Physics Education, with a high affinity for instrument utilization and a propensity for resource improvisation, the resourceful physics teacher will often be seen guiding a class of enterprising students to design, create and test simple laboratory instruments; dismantle, study and replicate them, including , fabrication and testing of prototypes. This is the typical scenario that defines the rudiment of technological progression; now, feasting on the carcass of the monster of examination malpractice.

Summary/Conclusion

Examination malpractice wreaks havoc on physics education, making nonsense of technological pursuit in Nigeria. However, by proper manipulation of the four key elements of curriculum process (the curriculum, instructional material, the student and the teacher) we can have a crackdown on the monster of exanimation malpractice. Nonetheless, its demands sustained priority attention to the welfare of (Physic) teachers to drive the final nail to the coffin of the monster.

References

Abbas, Z. S. (2006). Effect of examination malpractice in Nigerian educational institutions, which Way Forward, *Nigerian Journal of Professional Teachers, 1 (3).*

Adamu, H. (2009). *Continuous assessment and examination malpractice in Nigerian Universities.* In P. N. Lass and J. A. Aghentsa (Eds.) Academy Congress Publication Jos: Nigeria Academy of Education.

Coletta, V. P. (1995). *College physics.* Oxford: Oxford University Press.

Eshiet, I. T. (1993). Instructional materials: Development, acquisition and improvisation. In I. T. Eshiet (Ed). *Methodology of Science Teaching: Historical and Conceptual Approach.* Abak: Belpot (Nig) Company.

Eshiet, I. T. (1996). *Improvisation in science teaching: Philosophy and practice.* Abak: Belpot (Nig) Company.

Esu, A. E. Enukoha, O. I. & Umoren, G. U. (2004). *Curriculum development in Nigeria for Colleges and Universities.* Owerri: Whyte and Whyte Publisher.

Ezekwesili, O. (2007). *Integrity manual for examiners, supervisor and invigilators.* Abuja: Federal Ministry of Education.

Federal Republic of Nigeria (2004). *National Policy on Education*: Lagos NERDC Press.

Isaacs, A. (2002). *Oxford Dictionaries of Physics.* Oxford: Oxford University Press.

Nwana, O. C. (2000). *NEC/DLS course book on integrated science, cycles 1, modules* 1,2,3. Kaduna: National Teachers Institute Press.

Onyechere, 1. (1996). *Examinations Ethics Hand Book.* Potomac Books.

Ofuka, U. (1991). *Curriculum development for Africa*. Onitsha: Feb-Publishers Ltd.

Otuka, J. O. (2000a). *NCE/DLS course book on integrated science, cycle 3, modules 8, 9, 10, 11.* Kaduna: National Teachers Institute Press.

Otuka, J. O. (2000b). *NCE/DCS course book on integrated science, cycle 3, modules 8, 9, 10, 11.* Kaduna: National Teachers Institute Press.

Landu, I. T. (2006). Science process skills: An effective approach to primary science learning. *Nigerian Journal of Professional Teachers,* 1 (4).

Young, H. D. & Freedman, R. A. (1996). *University Physics.* Messachusette: Addison-Wesly Publishing Company.