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Effects of Practical On Candidates' Academic Achievement At The Advanced Level Physics General Certificate Of Education Examination In Buea Municipality.

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ABSTRACT: This study examined the effect of practical on candidates' academic achievement at the advanced level physics GCE examination in Buea municipality. Specifically, the study sought to examine how the practical paper and SBA affect candidates' academic achievement. Two research questions and two hypotheses were formulated to guide the study. Descriptive survey research design was used. The target population for this study was made up of all GCE Board staff that are involved in managing the centre during marking, the examination officer, the examiners involved in the marking of advanced level physics examination and the panel members (Assessor, Chief Examiner and assistant chief Examiners) and the scripts of candidates for GCE 2023 academic year. The accessible population consisted of all examiners that have marked for at least ten years and above, the chief of centre, the exam officer for advanced level physics, the panel members (Assessor, chief examiner and assistant chief examiners) and scripts of candidates. The sample comprised of 2 GCE Board staff, 6 senior examiners and 529 advanced level physics candidates scores drawn from public, lay-private and denominational high schools in Buea municipality from the 2023 GCE marking session. The instruments for data collection were a structured interview guide designed for 2 GCE Board staff and 6 examiners. and candidates' marked scripts. Data collected were analysed using thematic, descriptive and inferential statistics. For descriptive statistics, mean was used while for inferential statistics, Pearson product moment correlation coefficient was used to test the hypothesis at 0.05 level of significance. The findings revealed that practical paper have a direct and strong relationship on candidates' academic achievement at the advanced level physics GCE examination in Buea municipality with the correlation coefficient of, r_{xy}= 0.86. Also, it was revealed that there was a strong and direct positive relationship between SBA and candidates' academic achievement at the advanced level physics GCE examination in Buea municipality with a correlation coefficient of r_{xy} = 0.18. Based on the above findings, it was recommended that practical and SBA should carry more weight than the other assessment instruments for testing physics candidates, since they show the real performance of the candidates. The government should make sure that, practical is well done in schools by providing the equipment. The regional Inspectors should also ensure that SBA is well carried out in schools by carrying out regular inspections in schools.

Key Words: Practical, school-based assessment, academic achievement.

I. INTRODUCTION

Physics generates fundamental knowledge needed for the technological advancement which will in turn spearhead the economic engineering of the world (Zhaoyao, 2012). The concept learnt in physics contributes immensely to the technological infrastructure needed to make scientific advances and discoveries (Kola, 2013). Physics plays a major role in health education, economic development, energy and environment. The x-rays, radioisotope nuclear resource imaging, laser electron, microscope, synchrotron radiator among other advances in medicine depend on physics (Kola, 2013). The knowledge of electronics and quantum physics have enabled development of computers technology (Viladya, 2003). Our world is more connected through advances in physics that have benefited the transportation industry from building of efficient automobiles, sea vessels, aero planes to navigation using the global positioning system (Juan, 2009). Physics plays an important role in technological advancement. This is because the principles of physics are the ones which are used in the production of such technologies like computers (Jucevicience & Karenauskaita, 2004; Zhaoyao, 2002). Acquisition of physics knowledge and principles helps in various encounter and scientific advancement. The wheel and aeroplane and all other Machinery depends on knowledge of physics, Mobile phones and their attendant spinoff technologies. Physics continues to influence applications in medicine, medical methods including imaging technologies (X- rays, CT-Scanning, ultra-sound, echo techniques, MRI technologies) and diagnostic patient screening techniques (Freeman, 2012) are based on Physics principles. Continuing research into challenges posed by diseases and the conduction of business around the world is done almost effortlessly (Olufunke, 2012).

Despite the importance of Physics in the scientific and technological development, Physics education has been facing various challenges. First, the enrolment in Physics course at all levels is low in many African countries (Amunga et al., 2011). Many reasons are advanced for this discrepancy which include inadequate lower-level preparations, weak mathematics background, and lack of job opportunities outside the teaching profession, inadequate teacher qualification as well as possession of below standard pedagogical content knowledge (Semela, 2010). Many students consider Physics as difficult, abstract and theoretical (House of Lords, 2006). Many students find the subject boring, unemployable (Hirschfield, 2012) and as a result interest in high school Physics is decreasing. Secondly, the students' enrolment is low compared to other science subjects (Garwin & Ramsier, 2003).

II. STATEMENT OF THE PROBLEM

The performance of the physics is lower than in the other science subjects. This is compounded by issues of low interest and poor motivation to study the subject. The rising problem of students' poor performance in secondary school physics needs to be addressed urgently for more students to play an important role in achieving goals of Cameroon's Vision 2035. These require concerted effort from all stakeholders in order to improve the country's technological standing in the creation of social, technological and industrial transformation. For the students to attain their full potential and to contribute meaningfully in the country's technological and scientific development, studies that can foster students' interest in physics using appropriate instructional technologies are desirable. This study investigated the effect of practical on candidates' academic achievement in physics.

Physics virtually touches every sector in life, therefore advanced level physics candidates should be assessed on their intellectual, technical and practical skills, using assessment instruments, which assist teachers in assessing candidates' achievement. The General Certificate of Education GCE Board is responsible for carrying out summative assessment to determine students' academic achievement, and physics records the lowest success rate in Buea municipality when compared to other science subjects, despite the GCE Board making use of different assessment instruments; essay paper, MCQ, practical paper and SBA to assess candidate. It against this background that the researcher decided to find out whether practical paper and SBA are significant determinant of candidates' academic achievement in physics.

III. THEORETICAL REVIEW

This study was guided by Novick (1966) true score theory and Jerome Bruner (1962). theory of Cognitive Development. Novick (1966) true score theory cited in Awandia (2022), states that any score of a respondent on an item or a test can be expressed as; $X = T \pm E$, where x is the observed score (one that is given to the taste based on his or her responses to the test items), T is the true score (actual or true performance of the individual, all thing being equal) and E is the error score (that error that occurs as a result of our being human and reliable to marking mistakes).The above equation implies that an individual observed score in a test contains some errors which may be working to his or her advantage or disadvantage. When it works to his advantage the test score is inflated by that error score (signifying a (+) in the formula), this is usually the case when a candidate involves him/her self in examination malpractice. If it works to his or her disadvantage the test score is depleted by the error score (signifying (-) in the formula). This may be due to rubrics or other effects. Measurement experts are always interested in looking for ways by which the error component of text scores can be reduced to the barest minimum (Novick, 1966 cited in Joshua (2005). It therefore goes without saying that through the use of multiple instruments in assessment this error score can be reduced. This can only be possible through the effective implementation of school-based assessment as a component part of the final assessment (Awandia,2022).

The second theory on which the study is anchored on is the Cognitive development theory by Jerome Bruner (1962). According to him, the goal of education should be intellectual development and not memorization of facts. He insisted that learning should entail the acquisition of the process of knowledge but not mere memorization of facts. Instruction should therefore teach the learner how to participate in the process that makes possible the establishment of knowledge. It should not be a matter of getting the learner to commit the results to mind. The aim of teaching a discipline is to get learners to take part in the process of knowledge. According to him, acquiring knowledge is a process rather than product.

Bruner advocated organizing concepts and learning by discovery. He believed that learners can be able to construct knowledge by interacting with the world around them. He identified three stages of cognitive development, the enactive, iconic and symbolic representations. Enactive, which is the representation of knowledge through actions while iconic, which is the visual summarization of images. The last one is the symbolic representation, which is the use of words and other symbols to describe experiences.

The enactive stage appears first. This stage involves the encoding and storage of information. There is a direct manipulation of objects without any internal representation of the objects. For example, a baby shakes a rattle and hears a noise. The baby has directly manipulated the rattle and the outcome was a pleasurable sound. In future, the baby may shake his hand, even if there is no rattle, expecting his hand to produce the rattling sounds. The baby does not have an internal representation of the rattle and, therefore, does not understand that it needs the rattle in order to produce the sound. The iconic stage appears from one to six years old. This stage involves an internal representation of external objects visually in the form of a mental image or icon. For example, a child drawing an image of a tree or thinking of an image of a tree would be representative of this stage.

The symbolic stage, from seven years and up, is when information is stored in the form of a code or symbol such as language. Each symbol has a fixed relation to something it represents. For example, the word 'dog' is a symbolic representation for a single class of animal. Symbols, unlike mental images or memorized actions, can be classified and organized. In this stage, most information is stored as words, mathematical symbols, or in other symbol systems.

Bruner believed that all learning occurs through the above stages. He believed that learning should begin with direct manipulation of objects. It should be followed by construction of visual representations, such as drawing a shape or a diagram. Finally, a learner understands the symbols associated with what they represent. The theory is applicable in this study because it advocates learning through a process. The method of acquiring skills in physics is a process. The current study advocate that the science process skills should be evaluated because it is through the processes that the learner acquires knowledge but not the end product- the results. According to Brunner the process of knowledge acquisition is more important than the product. So, manipulation in the laboratory, the students will be able to acquire knowledge and skills that they can apply in daily life.

IV. REVIEW OF RELATED LITERATURE

Physics is a difficult subject to learn (Shi, Power & Klymkowsky, 2011). Students always have this kind of perceptions and low confidence which lead to fewer students to take up physics at school (Hezekiah & Omunyin, 2022). Science is an integral part of everyone's life. Scientific knowledge and skills provide practical assistance in helping people make informed decisions and choices concerning life that best suit them (Hirschfeld, 2012). Physics generates fundamental knowledge needed for future technological advances that will continue to drive the economic engines of the world (Amunga, et al. 2011). It contributes to the technological infrastructure and provides trained personnel needed to take advantage of scientific advances and discoveries (Freeman, 2012)

Science practicals are a vital part of science education. They help students to develop their understanding of science, appreciate that science is based on evidence and acquire hands-on skills that are essential if students are to improve in science performance and progress in science. Knowledge of how teaching methods affect students"learning may help educators to select methods that improve the teaching and learning quality and effectiveness (Babikian, 2020). An appraisal of the role of physics practicals as an approach or method in the learning and teaching of physics is necessary. This can be done by conducting related classroom-based relevant research on central issues like the effectiveness of the method, which can shape and improve physics learning, consequently improving performance. Hence, the study intended to find out the effects of physics practicals on learners"performance in physics in Cameroon secondary schools. Therefore, practical work needs to be reinforced during physics class to change students' perception towards physics and improve their performance (Lawrenz & Munch, 2018).

The branch of science concerned with the nature and properties of matter and energy is physics. The subject matter of this subject includes: mechanics, magnetism, heat, light, radiation, sound, electricity, magnetism and the structure of atoms. Experimental physics or practical physics is a category of discipline and sub disciplines in the field of physics that are concerned with the observation of physical phenomena and experiments. Physics is a practical science, practical activities are not just motivational and fun they can also sharpen student's powers of observation, stimulate questions and help develop new understanding and vocabulary. Good quality appropriate physics experiments and investigations are the key to enhanced learning and clarification and consolidation of theory (Lunetta, Hofstein & Giddings, 2017).The main purpose of laboratory work in science education is to provide students with knowledge to help them learn scientific concepts, and through scientific methods, to understand the nature of science. Laboratory work also gives the students the opportunity to experience science by using scientific research procedures. In order to achieve meaningful learning, scientific theories and their application methods should be experienced by students. Moreover, laboratory work should encourage the development of analytical and critical thinking skills and encourage interest in science (Lunetta, Hofstein & Giddings, 2017).

Several studies suggest that practical activities, whose central aim is to assist students develop their knowledge and understanding of the natural world, vary significantly in learning demand. If the purpose is for students to examine an object, or material, or event that they have not seen before, or not looked at directly before – and to remember what they see – then the learning demand is comparatively low. Many students will remember it for some time; the more astonishing or remarkable the observation is, the longer they are likely to commit to memory (Kyle, 2019). But if the objective is to help students develop their understanding of descriptive ideas, concepts, models or theories, then the learning demand is much greater. To a large extent practical work is somewhat ineffective because teachers under rate the challenge the students face in making sense of what they see. The thought that explanations 'emerge' from observations has been called 'the fallacy of induction' (Lunetta, 2017). We might anticipate that activities of high learning demand would be planned or presented in class in ways that reflected this; a recent study, however, found little difference in the way activities of higher and lower learning demand were designed or presented (Lunetta, Hofstein & Giddings, 2017).

Traditional laboratory classes normally involve students carrying out teacher-structured laboratory exercises or/and experiments, where each step of a procedure is vigilantly prescribed and students are expected to follow and adhere to the procedures precisely. This kind of laboratory activity is in which little student involvement with the content is required. For such kind of activities, Johnstone, add that students can be successful in their laboratory class even with little understanding of what they are actually doing. Physics practical should be conducted in such a way that they interact with ideas, as much as the phenomena themselves. It is necessary for teaching to focus upon scientific ways of talking and thinking about phenomena, rather than the phenomena themselves (Niaz, 2015). Teachers can employ a wide variety of teaching strategies to engage students" minds in learning. Reports emphasize that teaching science with the help of physics practical makes physics to be more enjoyable and stimulating to students than teaching the same subject matter only through lecture. Students have a lot to benefit from Physics practical which may include increasing students" interest and abilities in the subject as well as their achievement in Physics. Teachers usually control the frequency and, to some extent, the quality of Physics practical in schools. The volume and variety of physics practical in schools has lessened over time. In many situations, the cause of this is the focus on 'teaching for examination", which has squeezed out some types of Physics practical. Many teachers complain that, with pressure to get through the syllabus, they cannot find room for many Physics practical. Teachers are being required to achieve better examination results and one response to this has been to focus more on book learning which is more easily managed than physics practical. Teachers had to teach didactically to get through the content according to the examining body specifications (Zitoon, 2016). In Cameroom schools, many physics teachers only start doing practical in upper sixth which is the second and the last year of the programme. Because of this many students hardly master the skills needed.

Osunde and Ethe (2007) defined school-based assessment (SBA) as an assessment practice that broadens and expands the form, mode, means and scope of assessment in the school in order to facilitate and enhance learning. Ukwuije and Opara (2013) defined SBA as a comprehensive, systematic, continuous, diagnostic and integrative teacher-directed assessment procedure. School based assessment needs to be continuous and integrate the three domains of cognitive, affective and psychomotor. It allows for the collection of a number of samples of students' performance over a period in tests, assignments, projects, quizzes, bench work and group presentations.
SBA as teacher-directed assessment procedure involves the teachers from the beginning to the end that is from planning the assessment programme to the administration. It can also involve self, peer and teacher assessment. SBA within the educational context comprised of continuous and final assessment carried out in the schools. The SBA known as teacher-made assessment serve numerous purposes such as diagnosing individual strengths and weaknesses, monitoring and certifying students' progress, prescribing instruction, providing feedbacks to students and parents, improving teacher's instructional procedures, discovering the strengths and inadequacies in curriculum content and organization (Aruna, Zoker and, Karim, 2022).

Omole (2007) states that SBA is considered as internal examination and it is quite different from certificate examinations conducted by specified examination bodies/agencies outside the school's direct control. Certificate examinations are called External Examination (EE) or Externally Based Assessment (EBA). They are those examinations conducted by external examiners. An external examiner according to Nwana (2007) is construed or understood as any person who is outside the immediate educational environment or authority as that of those being tested. This implies that he or she does not belong to that environment and the testees are not familiar with him or her.

School based assessment (SBA) is an assessment which is embedded in the teaching and learning process. It has a number of important characteristics which distinguish it from other forms of assessment. It allows the teacher to give immediate and constructive feedback to students. It provides information about learning that can be used to diagnose learner's strengths and weaknesses, provide feedback on teaching and learning, provide basis for instruction placement, motivate and focus learner's attention (Peter & Kalkenburg, 2006). In Cameroon, the main reason why school-based assessment is introduced as part of the GCE examination is because it improves the validity of assessment among students (Peter & Kalkenburg, 2006). This is because not all subjects or learning outcomes can be assessed using written examination only.

Practical work such as laboratories, workshops, research project and others that need more time to finish can only be assessed by school-based assessment. Other than that, school-based assessment also increases the reliability of assessment where multiple type of assessment can be used rather than depends on only one examination as well as to provide more reliable evidences or picture of students' abilities (Peter & Kalkenburg, 2006). This assessment is planned, administered, scored, recorded and reported systematically according to the laid down procedures (Peter & Kalkenburg, 2006). In a real sense, school-based assessment scores in any subject for a particular student should reflect his or her achievement in the external examination.

School-based assessments (SBAs) are a form of assessment that takes place within the school or classroom environment and can vary depending on the educational system and curriculum. Several factors or parameters can affect the quality and fairness of school-based assessments when administered to students. Here are some key factors to consider: Clear Assessment Objectives: Clearly defined objectives and learning outcomes should guide the design and implementation of SBAs to ensure that they align with the curriculum and educational goals. Assessment Tools: The choice of assessment tools or methods (e.g., essays, projects, presentations, quizzes, tests) should be appropriate for the specific learning objectives and the skills or knowledge being assessed. Rubrics and Criteria: Transparent and well-defined grading criteria or rubrics should be provided to students so that they understand how their work will be evaluated. Teacher Training: Teachers should be adequately trained in assessment practices to ensure consistency and fairness in grading and feedback. Standardization: There should be some level of standardization in the administration and grading of SBAs to minimize bias and ensure fairness across different classrooms or teachers. Bias and fairness: Efforts should be made to minimize bias and ensure fairness in the assessment process, including addressing cultural, gender, and socioeconomic biases that may affect student performance. Feedback and formative assessment: Frequent and constructive feedback to students during the assessment process can help them improve their performance. Formative assessment strategies should be integrated into teaching practices. Student preparation: Adequate preparation and guidance for students in understanding the assessment expectations and requirements can improve the quality of their work.

Resource availability: Access to necessary resources, such as materials, technology, and libraries, should be equitable to all students to ensure they can complete their assessments effectively. Time management: Sufficient time should be allocated for students to complete SBAs without unnecessary time pressure, especially for longer-term projects.

Support for diverse learners: Accommodations and support should be provided for students with special educational needs to ensure that they have an equal opportunity to succeed. Record Keeping and data security: Proper record-keeping of assessment results and data security should be maintained to protect students' privacy and ensure data integrity. Parental involvement: Parents or guardians should be informed and involved in the assessment process to support their child's learning and provide a holistic view of student performance. Ethical considerations: Ethical standards, including the prevention of plagiarism and cheating, should be communicated and enforced during assessments. Assessment timing: The timing of assessments should be well-planned to avoid excessive assessment periods and allow students to manage their workload effectively. Assessment literacy: Students should be educated about assessment strategies and given opportunities to develop assessment literacy skills. Quality assurance: Periodic reviews and evaluations of the SBA process should be conducted to ensure its effectiveness and alignment with educational goals. Stakeholder Communication: communication with students, parents, and other stakeholders about assessment expectations, outcomes, and feedback mechanisms is crucial.

These factors collectively contribute to the fairness, validity, and reliability of school-based assessments. Ensuring that these parameters are carefully considered and implemented can lead to more meaningful and effective assessment practices in the educational setting

V. RESEARCH METHODOLOGY

This study adopted the use of both qualitative and quantitative approaches for soliciting views from the respondents. Descriptive survey research design was used. The target population for this study was made up of all

GCE Board staff that are involved in managing the centre during marking, the examination officer, the examiners involved in the marking of advanced level physics examination and the panel members (Assessor, Chief Examiner and assistant chief Examiners) and the scripts of candidates for the 2023 GCE examination. The accessible population for this research consisted of all examiners that have marked for at least ten years and above, the chief of centre and the exam officer for advanced level physics and the panel members (Assessor, chief examiner and assistant chief examiners). The sample comprised of 2 GCE Board staff, 6 senior examiners and 529 advanced level physics candidates scores drawn from public, lay-private and denominational high schools in Buea municipality. The instruments for data collection were a structured interview guide designed for GCE Board staff, senior examiners and candidates past scripts for the June 2023 session. Data collected were analysed using thematic, descriptive and inferential statistics. Pearson product moment correlation test was used to verify the hypothesis at 0.05 level of significance.

VI. DATA ANALYSES /RESULTS

Research Question One: What is the effect of practical paper on candidates' academic achievement at the advanced level physics GCE examination in Buea municipality?

Table 1

Table 1 shows the thematic analysis of those interviewed on the effect of Practical paper on candidate academic achievement at the advanced level GCE examination

Question Item	Grounding	Responses
How does practical test contribute to candidates' understanding, application of practical skills and knowledge in your subject area?	8 (100%)	Practical test enables candidates to gain skills in manipulating equipment to attain required result. It also makes candidates to believe in the facts stated in theory.
What assessment criteria or rubrics do you use to evaluate candidates' performance in practical test, and how do you ensure consistency in grading?	8 (100%)	Diagrams showing at least one quantity measured, observation, procedure, graph, calculation, precaution, etc. Each part has specific marks allocation.
Do you conduct practical in all the major sections of the syllabus equitably?	8 (100%)	For topics like modern physics, it is difficult to have local materials to conduct practical.
Are there any challenges or limitations associated with conducting practical test that may affect candidates' academic performance?	8 (100%)	Yes. In some areas, electrical energy is not available or constant. So, it can be very difficult to get ice to conduct experiments on latent heat of ice which is often tested.

All those interviewed said that, practical paper has an effect on candidates' academic achievement at the advanced level physics GCE examination. As seen above, all those interviewed acknowledge that practical paper contributes greatly to candidates' understanding as well as assessment of candidates since each step is allocated a mark. They also said that it is impossible to carry out practical in all the major sections of physics. But added that, there are challenges and limitation in conducting practical paper which affects candidates' academic achievement.

Verification of Hypothesis One (Ho_1): There is no statistically significant relationship between practical paper and candidates' academic achievement at the advanced level physics GCE examination in Buea municipality.

The Pearson correlation coefficient (r) was used to test hypotheses for this study. The interpretation of the hypotheses according to the Pearson r was based on two points which are: Accept the null hypothesis (Ho_1) and reject the alternative hypothesis (Ha_1) if the calculated Pearson r is less than the critical value of the Pearson correlation coefficient statistical table. Accept the Ha_1 and reject the Ho_1 if the calculated Pearson value is greater than or equal to the critical value of Pearson on the statistical table.

Table 2

The Effect of Practical paper on Candidate' Academic Achievement at the Advanced Level Physics GCE Examination.

Variable	Mean	N	r_{xy}	p-value	Df	Critical (r_{xy})
Practical Test		529	+0.86	0.001	527	0.09
Candidates'Academic Achievement	42.64	529			527	

Correlation is significant at the 0.05 level (2-tailed)

The findings in table 2, revealed that the mean was 42.64 from the scores of 529 candidates whose scripts were used. This paper contributes to 15% of the candidates' academic achievement for the advanced level physics GCE Examination. The mean value (42.64) indicates that, candidates' achievement is just below average. The standard deviation is 16.31 and the Pearson product moment correlation is found to be +0.86. This is an indication that, there is a strong and direct relationship between practical paper and candidates' academic achievement.

The calculated Pearson r_{xy} value for the effect of the practical paper on candidates' academic achievement at the advanced level physics GCE examination is 0.86 and the observed value is 0.0897, which is significant at the 0.05 level with 527 degrees of freedom. Following the decision rule, the null hypothesis which states that, there is no statistically significant relationship between practical paper and candidates' academic achievement at the advanced level physics GCE examination in Buea municipality is rejected and the alternative hypothesis which states that, there is a statistically significant relationship between practical paper and candidates' academic achievement at the advanced level physics GCE examination in Buea municipality is retained. This therefore means that practical paper has a major effect on candidates' academic achievement.

Research Question Two: What is the effect of school-based assessment on candidates' academic achievement at the advanced level physics GCE examination in Buea municipality.

Table 3

Table 3 shows the thematic analysis of those interviewed on the influence of SBA on Candidate Academic Achievement at the Advanced Level GCE Examination

Question Item	Grounding	Responses
How does SBA contribute to a more holistic understanding of candidates' academic achievement beyond standardized testing?	8 (100%)	"It contributes a lot because the candidates' errors are constantly corrected to a point that the errors are no longer made. This is true when the candidates submit their manual after each exercise and the teacher corrects the exercise and give feedback".
Can you share examples of how SBA has helped identify and address specific learning needs or gaps among your candidates?	8 (100%)	"In writing precautions, they no longer write instructions as precautions". "In collecting data, every measured physical quantity recorded must have its magnitude and units reflecting the precision of the instrument used in carrying out the measurement".
What challenges if any, have you encountered when implementing SBA, and how have you addressed these challenges?	6(75%)	"Too much work in planning, supervising and correction of exercise. This is as a result of insufficient teachers during practical sessions".
In your opinion, are the score of candidates collected from schools consistent with the scores in the practical paper? If no, can you suggest reasons for the anomaly?	8 (100%)	"No. some candidates just collect manuals from their friends, copy without seeing or touching the equipment. So, some of the scores are not consistent with the candidates scores in the practical paper".

Majority of the interviewees agreed that school-based assessment has an effect on candidates' academic achievement at the advanced level physics GCE examination while only one disagreed. For instance, they all accepted that SBA contribute to a more holistic understanding of candidates' academic achievement beyond standardized testing equally shared examples of how SBA has helped identify and address specific learning needs

or gaps among their candidates. They all said SBA has some challenges and that a few scores of candidates collected from schools are not consistent with the scores in the practical paper.

Verification of Hypothesis Two (Ho_2): There is no statistically significant relationship between SBA and candidates' academic achievement at the advanced level physics GCE examination in Buea municipality.

Table 4

The Effect of SBA on Candidate' Academic Achievement at the Advanced Level Physics GCE Examination

Variable	Mean	N	r_{xy}	p-value	Df	Critical (r_{xy})
SBA	16.02	529	+0.18	0.001	527	0.09
Candidates'Academic Achievement		529			527	

Correlation is significant at the 0.05 level (2-tailed)

Table 4 revealed that the mean scores of 529 candidates who scripts were used was 16.02. SBA contributes to only 5% of the candidates' academic achievement for the advanced level physics at the GCE Examination. The mean value (16.02) indicates that, candidates' achievement is high and candidates finds this part of the exam very cheap. This is an indication that, there is a direct relationship between SBA and candidates' academic achievement. This means that, the higher the mean value of SBA, the higher the candidates' achievement at the advanced level GCE examination.

The calculated Pearson r value for the effect of SBA on candidates' academic achievement at the advanced level physics GCE examination was 0.18 and the observed value was 0.0897. Following the decision rule, the null hypothesis which states that, there is no statistically significant relationship between SBA and candidates' academic achievement at the advanced level physics GCE examination in Buea municipality was rejected and the alternative hypothesis which states that, there is a statistically significant relationship between SBA and candidates' academic achievement at the advanced level physics GCE examination in Buea municipality was retained. This therefore means that, SBA has an effect on candidates' academic achievement.

VII. CONCLUSION

This study investigated the effect of two assessment instruments on candidate academic achievement at the advanced level physics GCE examination. Specifically, the study sought to find out how practical paper and SBA affects candidates' academic achievement at the advanced level GCE examination. Based on the findings of the study, the following conclusions were made in line with the research questions.

For research question one, the findings, revealed that, practical paper has an effect on candidates' academic achievement at the advanced level physics GCE examination. Therefore, practical paper weighting should be increased at the GCE Board since it measures an important part of the candidates' achievement at the advanced level physics GCE examination.

Again, with respect to the findings of research question two, it was concluded that, SBA has a significant effect and a direct relationship with candidates' academic achievement at the advanced level physics GCE examination. As a result, candidates turn to achieve very high when assess with this instrument. Therefore, teachers should pay more attention on the candidates' performance during SBA and the SBA weighting should also be increased.

These findings are supported by Uwaifo (2012) who found a statistically significant relationship between theory and practical scores on all science subjects. A similar correlation was also found between understanding science subjects and practical work which led to improvement in achievement tests (Wasanga, 2009). Practical work makes the students take science learning seriously as demonstrated by Amunga, et al (2011). The determination to meet physics objectives requirements of practical task leads the student to take charge of the learning situation and develop an insight in the requirements of the task involved. Lunetta et al (2007) suggested that engaging in science practical work provides simulation experiences which situate students' learning in states of inquiry which needs high mental and physical engagement.

These findings are also supported by the findings of Aruna, Zoker & Karim (2022) who noted that many science teachers recognized the importance of practical work. They believed that students should have first-hand practical experience in laboratories in order to acquire skills in handling apparatus, to measure and to illustrate concepts and principles. Having firsthand information will allow students to apply the skills acquired during practical work when they become scientists in future. Physics is a subject that search for truth. Hence, to a student physics should be as sacred and as pious as the place of worship to a devotee. In fact, physics study enables young

minds to equip themselves for something higher and noble as search for truth and unrevealing the mysteries of nature. Demonstration of experiment is important for understanding the principles of physics. However, performing experiments by one's own hand is far more important because it involves learning by doing. It is necessary to emphasize that for a systematic and scientific training of young minds, a genuine laboratory practice is a must (Aruna, et.al.,2022). According to educational psychologists like Novick (1966) and Bruner (1962), the attitude of the student plays an important role in his systematic and scientific training. Science is a great human expertise. Open mindedness, curiosity, collection of data, demand for verification and proofs statistical reasoning, suspended judgments, acceptance of warranted conclusion and willingness to change over opinion in the light of new evidence are the ferments which characterize the scientific world.

VIII. RECOMMENDATIONS

The study sought to find out how assessment instruments affect candidates' academic achievement at the advanced level physics GCE examination and based on the above findings, the following recommendation were made;

In response to research objective one, the researcher recommended that the weighting of the practical paper should be increased since it measures candidates' practical skills. The government should make sure that physics laboratories are well equipped. Teachers should use the practical approach in the teaching of the subject because it leads to acquisition of science process skills, enhances students' understanding and eventually better students' performance in the subject.

In response to research objective two, the researcher recommended that, the government should make sure that, SBA is well done in schools and teachers should put in more emphasis on SBA since that is the only place where candidates actually gain practical skills. More teachers should be made available during SBA for proper follow up of students.

Inspectors should visit schools regularly so as ensure that SBA is well carried out so that the candidates' scores are valid and reliable.

Students should be properly taught how to perform experiment, represent data, analysis data in a form of a topic know as introduction to Physics Practical before they are engaged in the practical itself.

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