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A Review of Students' Academic Performance in Physics: Attitude, Instructional Methods, Misconceptions and Teachers Qualification

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ABSTRACT

This study aims at presenting a literature review on four factors; attitude, instructional methods, students' misconception, and teachers' qualification that contribute to low academic performance of students in physics. Physics is one of the most fundamental natural sciences which involves the study of universal laws, and of the behaviors and relationships among a wide range of physical phenomena. Research has shown that both teachers and students' attitude towards physics is a major reason for low academic performance in subjects across the globe. Naki (2018) argued that attitudes such as procrastination have a greater impact on students' achievement. The attitudes of students towards physics, the thoughts and beliefs about the course, the habits of studying and constantly postponing tendency are very influential. Boabeng *et al.* (2014) opine that the quality of the teachers implementing a curriculum has a greater effect on the academic performance of students. Regardless of how well-resourced the school is or how extensive the curriculum is, teaching methods also have a significant impact on students' academic progress as well as how easier for a misconception is to be dispelled. When the finest teaching strategies are employed, physics teachers can have a significant positive impact on students' knowledge hence good performance.

Keywords: academic, attitudes, instructional method, misconception, performance, physics, students, teacher, qualification.

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I. INTRODUCTION

The development of every nation is pivoted around a strong education system in that nation. In a fast-growing world, a country is considered developed when it has advanced in technology. Advancement in technology has a strong link with science education. Science is taught at every level of the education system because of the keys it has for scientific and the socio-economic development of a country. The science which aims at understanding the physical world we live in is called physics. The Common Core Program for Science in Ghana has provided justification for the necessity of science instruction at all educational levels (NaCCA, 2020). It implies that the desire of man to comprehend both his immediate surroundings and the larger universe is the source of science, which is a cooperative and creative human endeavor. Ghana claims that students would be able to build on what they learned in lower Basic school levels and subsequently enhance their knowledge of and interest in science at various stages of science throughout their life by studying the Common Core Science Program from Basic 7 through Basic 10. Additionally, it emphasizes how science's products and technologies are all around us, and how government policy choices that have an impact on every area of people's lives are founded on scientific facts. The incredibly intricate natural world that surrounds us serves as an illustration for countless scientific ideas. In order to grasp problems and lead successful lives, humans must be scientifically literate as they develop in a world that is becoming more technologically and scientifically advanced. It goes on to say that a nation's ability to develop economically, politically, socially, and physically depends on its use of science, technology, and innovation. It is an ongoing creative process that advances knowledge and comprehension. (NaCCA, 2020). Physics is a branch of science that focuses on the nature and properties of both matter and energy. Among the topics covered by physics include mechanics, heat, light and other radiation, sound, electricity, magnetism, and the structure of atoms. Physics is a discipline that students learn by experience, giving them the chance to observe and experiment, apply knowledge, solve theoretical and practical problems, discover, and explore their environment, and further develop their talents. Since physics is the foundation of engineering and technology, it is vital that it be studied in schools, colleges, and universities. Coffie *et al*. (2020) explain that students with a good foundation in physics have a higher degree of precision and accuracy when approaching new problems and are able to reason both deductively and inductively. Since physics heavily relies on mathematical ideas and logic, it aids students in developing critical thinking.

Physics students' ability to progress in their education depends on their understanding and application of physics concepts. The measurement of student achievement across various topics in physics will ensure their progress in physics education.

Over the years, several researchers have been trying to research ways of improving the academic performance of students in physics. To obtain refined ways of improving academic performance researchers have also researched into factors/causes of poor academic performance in physics. This study aimed to revise at least four factors that contribute to poor academic performance in physics. These factors have been enumerated as attitude, teaching methods, misconception and teachers' qualifications.

II. Attitude

In psychology, an attitude is a collection of feelings, thoughts, and behaviors toward a specific thing, person, thing, or event. Attitudes are frequently influenced by experiences or upbringing. They can significantly affect how learners behave and react in various situations. Although views are enduring, they can change. A person's learned inclination to react favorably or adversely to an item, circumstance, idea, or other person is referred to as their "attitude" (Sarmah & Puri, 2014). According to Syyeda (2016), attitudes can change over time, and once a positive outlook has been established, it can benefit kids' learning (Akinsola & Olowojaiye, 2008; Mutai, 2011). On the other hand, a pessimistic view hinders effective learning, which has an effect on performance (Joseph, 2013). Therefore, attitude is a significant factor that needs to be taken into account. The effect of attitude on physics achievement can either be positive or negative depending on the individual learner. Throughout a child's education, the child comes into contact with different topics, teachers and teaching methodology that have impact on them. The experience they build and the behavior they put up is attributed to their attitudes. The attitudes of students towards physics, the thoughts and beliefs about the course, the habits of studying and constantly postponing tendency are very influential. Students' attitude towards a subject has the potential for ensuring high or low performance on the subject (Mohamed & Waheed, 2011; Mata *et al*., 2012; Ngussa & Mbuti, 2017). Affective, cognitive, and behavioral are the three main components of attitude, according to Syyeda (2016). The components interact with one another and contain numerous components that have an impact on how individuals perceive learning in any discipline in general. According to Sabel (2006), attitudes encompass ways of feeling, thinking, and doing as well as upholding an expression of one's identity in the context. "Attitude is a little thing that makes a tremendous difference," said Winston Churchill. Students' attitudes about learning, whether positive or negative, have an impact on how they view education in general. Hijazi and Naqvi (2006) claim that it is difficult to assess pupils' academic success since it depends on a variety of socioeconomic, psychological, and environmental factors. They needed to change their views toward their academic achievement since their attitudes toward learning had an impact on both how much they learned and how much they wanted to learn. Finding the causes of students' negative attitudes toward learning and using this knowledge to effect change are two steps in the process of changing those attitudes.

Practical experience has been identified by Musasia *et al*. (2012) as an influential factor in the learning of physics. For their experiment, the students were divided into two groups. The theoretical consequences are made clear and the girls' perceptions of physics are altered by giving them the opportunity to conduct practical studies. They concluded that there had been a considerable shift in the experimental group's attitude toward physics as compared to the control group. This group was able to verify the claimed experiences for themselves. They were able to control the pace at which the practical progressed. They found out that they could negotiate meanings and all of a sudden, the subject was comprehensible. This experience was repeated many times in the various experiments they went through. Lack of continued exposure to these experiments by the control group left them still wondering what the subject was all about. They had control over how quickly the practical moved along. When they realized that they might compromise on meanings, the matter at hand became understandable. In the different experiments they underwent, this experience was repeated numerous times. The control group wasn't exposed to the experiments in any more depth; thus, they were still unclear about the experiments' purpose.

According to Jufrida *et al*. (2019) students' enthusiasm will decrease if they have unfavorable opinions about how physics affects society. A student's motivation to learn physics will suffer if they don't comprehend the nature, advantages, beauty, and work that can be produced by studying physics. Students must be aware of the advantages of learning physics for it to be more enjoyable for them. It will not encourage the attitude of learning to study physics if pupils do not comprehend the nature of physics. Naki (2018), stated that the attitudes of students towards physics, the thoughts and beliefs about the course, the habits of studying and constantly postponing tendency are very influential towards their achievement. In his studies, he came to the conclusion that reducing procrastination has a favorable impact on students' interest in the class and helps them become more aware of the need of meaningful learning, self-confidence, and how to study and use their information and abilities. The option of students at secondary school does not influence their attitude towards physics. Mushinzimana & de la Croix Sinaruguliye (2016) carried out research on students' attitudes toward studying physics and revealed that neither gender, level of study, nor secondary school option had any bearing on how students felt about the subject. According to Mushinzimana & de la

Croix Sinaruguliye, 39% of people believe that there is no connection between physics and the real world. Regarding the efforts needed to understand physics, a sizable portion of participants held negative sentiments. The results also indicated that participants' degree of general problem-solving ability in physics was low. The item-by-item analysis revealed that there are statistically significant disparities in the replies of students from urban and rural schools in the categories of problem-solving and connections and understanding of physics topics.

Musasia *et al*. (2012) research on attitude change revealed that as soon as students realized they could compromise on meanings, the subject became understandable. In the different experiments they underwent, this experience was repeated numerous times. Thus, changing attitude can influence the understanding of physics at any level in the education hence boost the performance of students. To solve a physics problem effectively, students have to decide what conceptual knowledge to use for each smaller problem and the needed unknown information to complete each problem part. An attitude seems to be a state of mind about an item, event, or circumstance in the most basic sense. People can tell our attitudes by observing our behavior since attitudes are manifested via actions. It used to be thought that once we acquired an attitude, we couldn't change it. We now know that this is untrue. Psychologists claim that we frequently follow our own instructions. Since our expectations of ourselves are influenced by our attitudes, it follows that having unfavorable attitudes will also have an impact on our behavior. For instance, those who approach math with the negative mindset that they "can't do math," are almost certain to run into difficulties. A gloomy outlook hinders progress, depletes motivation, and limits performance (Dennis, 2011).

III. Instructional Method

The major objective of education at all levels is to bring about a fundamental change in the student using a range of teaching and learning strategies or methods (Oigara, 2011). The teaching approaches in teaching can make the subject interesting or boring. The type of principal and instructional strategies utilized are the best ways to categorize a teaching method. Depending on the knowledge or skill the educator is trying to impart, there are different teaching methods available. Examples of some teaching methods that physics teachers have used to deliver lessons to their students include inquiry method, field trip method, demonstration, laboratory method, the traditional or lecture method among others. According to Whalen III (2012), examining the results of the teaching-learning process, such as marks, grades, and mean scores, can help measure the efficacy of a teaching technique. Physics instruction should be able to strike a balance between quantitative thinking and problem-solving and qualitative thinking and conceptual comprehension. Every teacher knows that each lesson has its own learning outcomes (LO) and to be able to achieve this LO's largely depends on the kind of teaching method and teaching materials used. Gronlund and Brookhart (2009) assert that effective learning requires the use of learning objectives, sometimes referred to as learning outcomes. They support the creation of more effective lesson plans, activities, and evaluations by assisting in the explanation of the tasks that students should be able to complete after engaging in instruction method activities. The pedagogical approach used can clear up the misconception that most students have about physics being an abstract subject. The science of teaching is known as pedagogy. Pedagogy is the activity of teaching with the goal of creating distinctive societal effects through systematic delivery of instruction and practice. Science and science education both make use of pedagogy. To enable students to reason about physics in a qualitative and logical manner, to articulate their knowledge in a variety of ways, and to develop a basic comprehension of the conceptual framework of physics, physics teaching should be methodical and broken-down step by step. This is certainly the preserve of the teacher but once it is not handled properly, the performance of the learners will be questionable (Assem 2017). Again, for pupils to interpret and relate ideas and formal representations to the outside world or physical truths, they must repeatedly exercise this skill. Conceptual barriers cannot always be removed by the traditional teaching method. According to McDermott (2001), some conceptual problems continue even after education. Open discussion of persistent conceptual problems across settings is required. A unified conceptual framework is not always the expected outcome of conventional training. The instructor-student connection reflects the fact that achieving Newton's third law of motion and course objectives usually conflict with one another (McDermott, 2001). Therefore, it's important to enhance students' learning through means by which students will have a say in what they learn.

Zhan (2012) taught an eighth-grade class for one semester using 5E inquiry-based learning before moving to more traditional instruction for the following semester. Her study showed that after just one semester of inquiry-based training, students' learning interest and competency both greatly increased. However, once the traditional teaching methods were returned toward the conclusion of the second semester, student interest for learning science and their investigative skills decreased on all scales leading to poor performance at the end of semester examinations.

Abaniel (2021). investigated the effects of the open inquiry learning model in Physics on the concept and 21st century skill attainment, and learning attitudes of grade 12 students at a state university in the Philippines. There was a positive shift in the learning attitudes of students. Thus, the open inquiry learning model is effective in improving the conceptual understanding of 21st century skills and learning attitudes of students. Teaching using inquiry-based learning method has allegedly boosted student engagement in science learning and led to a richer conceptual grasp of scientific ideas, according to Abaniel (2021). Students' higher order thinking abilities and favorable attitudes toward learning science have also improved thanks to inquiry-based teaching methods. According to studies, inquiry-based teaching methods helped students enhance their language, research, process, comprehensive, questioning, and reflective skills.

Thomas, & Israel, (2013) suggested that the conceptual nature of physics needs several methods and project-based instructions which places the emphasis of student learning on real-life practice. They argued that lecture-based instruction relies on introducing new and complicated information to students in a familiar way. In any case, the teacher must make extensive preparations to ensure the maximum level of student learning and that students will use different skills to interact with the information. A graphic organizer and visual note sheet for the student must be included in the teacher's in-depth notes on each idea. A crucial component of training is giving the student information both verbally and visually, especially in situations without a typical laboratory. The history of science and other fact-based material can be effectively taught in scientific classes via lectures. Using graphic organizers, students can follow along with the lecture and work with the instructor to increase their grasp of each idea. Additionally, it enables the teacher to formally evaluate the students' knowledge as the session goes along. With the help of scientific models, teaching strategies such as conceptual conflict and analogies, can be created to influence students' perceptions of electricity and magnetism; topical concepts in physics at all levels (Driver *et al*., 1994).

According to Buabeng *et al*. (2014) study, classroom interaction, or the attitude of teachers and students during instruction dialogue, tended to be mostly teacher-centered and did not always support inquiry-based teaching and learning, which is known to encourage conceptual change and improve performance. In the science classrooms of the twenty-first century, especially in physics, there is little room for the conventional method of instruction where the teacher determines what happens in the classroom.

According to Thomas and Israel (2013) there isn't a single teaching strategy that can be considered the best in every situation. Instead, there are a variety of factors that can influence a teacher's decision, such as the material to be covered, the goals to be met, the time allotted, the number of students, the preferences and individual styles of the teachers, the type of lesson, the facilities available, and the students' needs and interests, among others. Thomas, & Israel, (2013) concluded that the Polya heuristic way of addressing problems is an alternate teaching approach that can improve students' current physics performance, especially when regular laboratories are hard to come by. Badmus, & Jita, (2022) suggested that teaching methods that encourage visualization should be used to enhance students' achievement in physics.

In science education, visualization is a way to comprehend how two separate brain systems; a verbal and a nonverbal one that encode verbal information (words and phrases) and visual information (pictures). In their work, they suggested that Spatial visualization ability remains a strong predictor of students' achievement in physics. Smale-Jacobse (2019) also said secondary education should use differentiated instruction, a pedagogical-didactical approach that provides teachers with a starting point for meeting students' diverse learning needs.

IV. Students' Misconception

From the moment of birth, one starts learning a wide range of things. People constantly observe the world around them with all five of their senses in an effort to comprehend it. Conclusions are occasionally drawn that are consistent with scientific findings, even if opinions are frequently formed with misunderstandings at their foundation. Once students begin attending school, they bring these erroneous views into the science classroom. The faulty assumptions inhibit people from acquiring new information when they try to assimilate it into their previous framework of knowledge. If not cleared up soon once, these misconceptions fester and affect their academic performance and grade point average. There are times when the myths are acknowledged and times when they are not. One of the most important duties of a scientific teacher is to identify these myths, help students identify them, give them the chance to dispute them, and, finally, make sure they have a genuine understanding of science and how the world works. The children will also perform well in science class and ultimately perform better in school. If they are not challenged in school, students actually carry these viewpoints into every aspect of their lives.

Misconceptions, according to Eryilmaz (2002), are beliefs that conflict with accepted scientific theories. The achievement of a student in science class is hindered by misconceptions. Students' misconceptions can obstruct their ability to achieve many of the requirements established for them in order to move on to the next stages of science. A student's performance in important exams may suffer if a misperception about a particular subject goes unrecognized. The despair and failure that follow may deter students from choosing a career in science (Tai *et.al*., 2006). An enthusiasm for science might also be prevented by the frustration of persistent misunderstanding. The teaching of courses in the natural sciences, such as physics, chemistry, and biology, is not exempted from these issues (Stein *et al*., 2006). Stephens (2006) is of the view that while physics myths that purport to explain correlations and other phenomena accurately are really incompatible with experiments performed in the laboratories, they are based on unimportant, inconsequential things. In a similar argument, misconceptions are a frequent by-product of learning, not a singular occurrence. Students could be exposed to inaccurate information, use faulty reasoning, or interpret what they read, hear, or see incorrectly, leading to the development of misunderstandings (Lilienfeld, 2010; Murphy & Alexander, 2013). According to studies on the learning of physics, students enter their physics classes with worldviews that diverge from those of conventional science. The term "misconception" has been used to describe the first common sense which students find challenging to alter in the course of their study (McDermott, 2004). It has been widely examined how frequent physics misconceptions are held by students of all ages. Studies of elementary, secondary, and college students as well as pre-service teachers have been done in the past (Gönen, 2008). (Darling, 2012; Demirci, 2005; Hestenes *et al*., 1992; Pablico 2010; Piburn *et al*., 1988; Stein *et al*., 2008). Literature on erroneous readings of scientific facts and processes based on intuition or preconceived notions demonstrates the pervasiveness of gravitational force mistakes. Many of these beliefs have been shown to be true, even in the face of conventional physics education, which prevents pupils from comprehending novel concepts. Misconceptions about force and gravity were examined in a previous study of high school students' perceptions of the direction of motion and force on a ball being thrown upward and then falling back down (Pablico 2010). The majority of study participants (grades 9–12) demonstrated the fallacy that the net force acting on the ball was always acting in the direction of motion throughout the ball's path, failing to recognize that the observed changes in motion are actually the result of the constant downward force brought on by gravity. Many pupils thought that the force was only applied upward during the ball's upward motion and that it was zero at the peak of the ball's flight. Several students claimed that the force must be directed downward because the ball is moving downward, despite the fact that the majority of students correctly identified the force as downward when the ball was moving downward. Furthermore, many students' conceptions of gravity are entangled with their conceptions of a spherical Earth (Gönen, 2008). Palmer (2001) found that when students in grades six and ten were asked which things were influenced by gravity, about 30% of students in each grade level were able to correctly respond that all of the objects were. Additionally, Palmer noted that some pupils believed that objects buried beneath were not subject to the effects of gravity.

Misconceptions about science can originate from a number of sources. Misconceptions can develop when a pupil is trying to understand a situation or occurrence in their environment. Often, these misunderstandings begin when people are very young. There are numerous factors that can lead to misconceptions. A few aspects include cultural perspectives, relationships with others, particularly family members, and outside observers (Chin & Chia, 2004). When a parent tries to explain something to their child, it happens frequently that the child accidentally forms an incorrect perception. Teachers who lack confidence in their subject matter and lack sufficient scientific knowledge may also be to blame for the spread of misunderstandings (Jarvis & McKeon, 2005). Other studies have said that misconception can take the shape of vernacular, preconceived notions, factual misconception, conceptual misunderstanding and non-scientific beliefs. Modell *et al.* (2005) contend that a science educator's main objective should not be to identify the names of misunderstandings. Misconceptions have a variety of definitions that are difficult to understand and can even be overpowering. Instead, the emphasis should be on identifying the core causes of the misconceptions and then finding methods to eradicate them. The much more significant objectives are to identify and correct misconceptions.

The Piagerian ideas of assimilation, accommodation, and to a lesser extent cognitive disequilibrium constitute the foundation of most of the study on conceptual change. A learner obtains new knowledge through assimilation, which involves incorporating it into pre-existing knowledge frameworks (Tao & Gunstone, 1999). Accommodation necessitates a modification to the learner's cognitive framework, or, in other words, a change in conceptualization, before the new knowledge may become a part of their knowledge (Dykstra *et al.*, 1992). It can therefore be challenging for students to change their early beliefs especially when their beliefs make a lot of sense to them. The new information must be integrated into their existing knowledge base. Although every teacher runs into students' misunderstandings, it is not a given that they think about the necessity to proactively address them. Misconceptions demonstrate a lack of understanding, or, to put it another way, an inability to recognize the connections that are already there. According to Gilbert *et al.* (1982), a major contributor to senior secondary school students' misconceptions in Nigeria is the teacher's manner of transmitting and evaluating physics in the classroom. This might be connected to senior secondary students' misconceptions in physics hence, a perfect source to poor academic performance in physics among students. The misconceptions appear to be backed by simple facts which might have arisen from practical experience as has been described as the frequent root of misconceptions by Bayraktar, (2009). Students, especially in lower-level classes, rely on this. Before beginning their physics studies, they already had some misconceptions (Clement, 2006). In the early stages of physics education, experiences play a particularly important impact (Hestenes *et al.*, 1992). Higher-class misconceptions can develop from arbitrary considerations and become a part of a complex mental structure. A number of misconceptions have been identified in physics which feed directly into various curriculum disciplines across the educational ladder.

Physics Misconceptions (newyorkscienceteacher.com). Some of these include:

1) Positively charged objects have gained protons, rather than being deficient in electrons.
2) Electrons which are lost by an object are really lost (no conservation of charge).
3) All atoms are charged.
4) A charged object can only attract other charged objects.
5) The electrostatic force between two charged objects is independent of the distance between them.
6) Gravitational forces are stronger than electrostatic forces.
7) Batteries have electricity inside them.
8) Energy is a thing. This is a fuzzy notion, probably because of the way we talk about newton-meters or joules. It is difficult to imagine the amount of abstraction.
9) The terms "energy" and "force" are interchangeable.
10) An object at rest has no energy.

Misconceptions in these forms can certainly affect students' performance in physics. Some myths pose serious obstacles to learning new things. These are similar to intuitive beliefs that could influence pupils to misunderstand or disregard new knowledge. In physics, a lot of students think moving things, like a baseball tossed or a coin flipped upward, have a force operating on them that keeps them moving (McCloskey, 1983). They consequently predict the motion of moving objects incorrectly. These kinds of myths are founded on false underlying presumptions or beliefs. A

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common fallacy is the fundamental attribution error, in which people tend to exaggerate personality and undervalue social circumstances as the root causes of other people's conduct. We often connect a person's behavior when they show rage to their character and ignore potential situational elements that could be driving the rage. Performance is actually determined by what one knows. Students in Mazur's physics class memorized equations and demonstrated problem-solving abilities, but they fared badly on assessments of conceptual understanding, according to Mazur (1996). He actually attributed this disparity to the fact that what students have learnt had conflicted with what they probably know. Thus, misconceptions can affect students' academic performance. There are various techniques for analyzing student misconceptions and separating them from those who comprehend incorrectly and lack information. The Certainty of Response Index (CRI), as suggested by Hasan et al, is one method (1999). Together with the primary conceptual instrument, the Certainty of Response Index is used. The CRI is used to gauge how confidently a respondent selected a conceptual instrument response. The instrument in this situation typically takes the shape of a multiple-choice test. Briefly said, the Certainty of Response Index gauges students' level of assurance in responding to each question so that it can later be used to classify those who comprehend concepts, those who don't, and those who have misconceptions. The Rotational and Rolling Motion Conceptual Survey, developed by Rimoldini *et al*. (2005) is one of the most well-known conceptual tools for dynamics and rolling motion. Misconceptions are stubborn and challenging to correct. Students' misconceptions must be corrected using a variety of well-researched techniques. The fact that each strategy uses meaningful learning rather than rote memory to directly address the misconceptions is something that unites them all. Unfortunately, the current educational system places too much emphasis on rote memorization, giving kids information for tests that they will rapidly forget. This form of education is easily adapted to by both students and teachers, but it won't help clear up misconceptions (Novak, 2002). For learning to be meaningful, student-centered, constructivist experiences must be used. Student-centered activities engage students in the learning process and encourage independent thought (Burrowes, 2003). An experience that adds new ideas while enhancing previously learned ones is a constructivist learning activity. The problem is that outdated ideas must also be modified in order to correct misconceptions. According to Udovic *et al.* (2002), processes used by real scientists, such as inquiry and problem-solving, are deemed student-centered and built on constructivist principles. The conceptual change model was a theory put forth by Posner *et al*. (1982) to address this issue. Identification of specific student misunderstandings is the first step required before performing training to dispel them.

According to studies, the most efficient way to clear up a great deal of physics misconceptions is through focused training that focuses on addressing these misunderstandings (Eryilmaz 2002; Hestenes *et al*., 1992; Thornton *et al*., 2009). The process of dispelling misconceptions entails becoming aware of them, thinking about alternative theories or explanations, weighing the pros and drawbacks of the two opposing viewpoints, and choosing a new theory that is more sensible than the old one. Self-reflection, examination, and critical thinking are all part of this process. evaluation, analysis, and self-reflection. Although it could seem like a really difficult task, all you need to do is use your noodles.

V. Teacher Qualification

In terms of student learning, effective teacher traits, including teacher actions and behaviors from the start to the finish of a lesson, are crucial. Haussler & Hoffmann (2000), as cited by Korur, & Eryılmaz (2012) point out that the issues most related to effective teaching are the personal effectiveness of teachers and teachers' pre-service and in-service professional development activities. Using a variety of tactics to promote physical, mental, emotional, and social growth, Harris & Sass (2011) claim that education is seen as a developmental process that involves the transition of a person's personality from childhood to adulthood. They continued by saying that the credentials of the teachers affect how well students succeed academically, which in turn affects how well the standard of education rises. According to Elsbree (2015), teacher certification in the United States of America (USA) implies a primary goal of providing the finest education that supports the potential and needs of kids and young people generally. In the United States, instructors who work in secondary public schools must be certified in order to fulfil their obligations and improve the academic performance of their students (Cremin & Lawrence, 2013). According to Tylor and Robinson (2019), teacher certification is seen as a requirement for the teaching profession in Sub-Saharan African (SSAC) countries and is also seen as a way to help a professional teacher advance their knowledge and abilities. Additionally, they noted that teachers who possess highly developed knowledge and skills have the opportunity to play a significant role in important decisions regarding the provision of high-quality services, which can be accomplished by raising students' academic performance and also developing their own careers in the teaching system. Since teachers are the foundation of any educational system, the caliber of the teachers in each system affects and reflects the system's overall caliber and the potential of its pupils (Darling-Hammond *et al*., 2009).

According to Ong'ute, R. A. (2009), physics teachers are trained to be professional physics teachers who should guide learners to get conceptual understanding of concepts in physics. indicated in his research that teacher experience, qualification of the teacher and the motivation of the teacher have a direct relationship with the performance of students in physics. Darling-Hammond (2000) is of the view that measures of academic ability, years of education, years of teaching experience, measures of subject matter and teaching knowledge, certification status, and teaching behaviors in the classroom are among the factors considered to be indicators of teachers' competence that have been investigated for their relationship to student learning.

Adedayo and Owolabi (2021) studied the relationship between teacher qualification and physics students' performance at the Secondary School level in Nigeria. They found that there was a significant difference in the performance of Secondary School Physics students taught by teachers with high qualifications compared to those taught by teachers with low qualifications. According to the research, students who were taught by qualified instructors had a cut-off point value (t-cal) of 12.86, which was higher than students those who were taught by the unqualified teachers, who had a cut-off point value (t-cal) of 1.98. According to Psacharopolous (1985), teachers should possess a high level of subject matter expertise through formal education, which is above the level of his students. Caillods (1989) discovered that teachers with more post-secondary education had better results with their pupils than teachers with less post-secondary education, which supports this.

According to Coffie *et al*. (2020), some physics teachers are teachers who instead of physics degrees have advanced degrees in business, engineering, or other related fields. A study conducted by Buabeng *et al*. (2014) revealed that some physics teachers hold degrees in media and project management which in actual fact do not qualify them to be teaching physics yet, they are teaching physics and being called physics teachers. This indicates that some teachers of physics with such credentials may lack the pedagogical training and subject-matter proficiency required to teach physics effectively. According to their assessment, even though the hired teachers may have subject-matter expertise and content knowledge, the same is not true of their pedagogical abilities and knowledge set, which are necessary to support effective instruction. Such challenges can pose serious threats to the academic performance of students who study physics. They believe that if a teacher is hired, they should pursue professional training to keep up with pedagogical techniques that will enable them to provide lessons that every child will grasp.

Korur & Eryılmaz (2012) believed that teacher's qualification is the first determinant of students' achievement. The attitude of both teachers and students affect achievement but a good characteristic of a teacher can resolve attitude and also help choose the right pedagogy for the learners. According to the findings of their research, the qualities of an effective teacher include subject-matter knowledge that can be transferred, knowledge of professional and teaching techniques, technology use in the classroom, enthusiasm for teaching, activities that promote meaningful learning, classroom management, individual characteristics, and a mindset toward discipline. These traits are typically included in pre-service and in-service teacher training programs. For instance, in Ghana, teachers with certificates in fields other than physics education lack the majority of these qualities and may not be productive unless they enroll in educational studies courses. According to Korur, & Eryilmaz (2012) teachers perceived teacher characteristics as having a greater effect on student motivation and achievement than did students. The eight main categories of effective physics teacher characteristics each had a strong effect on student motivation and achievement. These characteristics affected student achievement more than student motivation, according to teachers. Ango (1990) asserts that the main causes of students' subpar performance in physics classes around the world are a lack of student involvement in the teaching and learning process from the start of any new concept to be taught, a shortage of qualified teachers with teaching experience, and an absence or insufficiency of materials in the laboratories.

VI. Conclusion

In this review, we introduced basic research on the attitude, instructional method, misconception, and teachers' qualification that affect academic performance in physics, although there are many factors that contribute to poor academic performance of physics students.

The attitudes of students towards physics, the thoughts and beliefs about the course, the habits of studying and constantly postponing tendency are very influential. Students' attitude towards a subject has the potential for ensuring high or low performance on the subject. Musasia *et al*. (2012) used experiments to change the attitude of students towards the study of physics.

Physics instruction should be methodical and broken-down step by step to provide students the skills they need to reason about physics in a qualitative and logical way, to articulate their knowledge in a number of ways, and to develop a fundamental understanding of the conceptual framework of physics instead of the misconceptions they acquire through experience. Abaniel (2021) suggested that teaching using inquiry-based learning has allegedly boosted students' engagement in science learning and has led to a richer conceptual grasp of scientific ideas. As Fraser & Walberg (2005) maintain that teachers do a variety of tasks to make classrooms hospitable, guide and care for children, act as role models, pay attention to students, keep an eye out for potential issues, and much more impart knowledge to students through pedagogical skills acquired through professional training. It is very import to know the role that these factors mentioned above play in the physics learners' life and to also appreciate the role that the teacher has to play to ensure that academic performance among students is improved significantly in the physics classroom.

Conflict of Interest

Authors declare that they do not have any conflict of interest.

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