Research Article

EFFECT OF PHYSICS TEACHERS' EQUITY CLASSROOM BEHAVIOUR ON STUDENTS' ACADEMIC ACHIEVEMENT IN HIGH SCHOOLS IN SOUTHWEST REGION OF CAMEROON

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ABSTRACT

This study investigated the effect of physics teachers' equity classroom behaviour on students' academic achievement in high schools in Southwest Region of Cameroon. This study was based on the framework that teachers 'equity behaviour can enable students to do well in physics. Survey research design was used. The population of the study was 1602. The data was collected using a questionnaire. The Cronbach-Alpha reliability coefficient for the equity questionnaire was found to be 0.81.The simple random sampling technique was used to obtain the sample of the study which consisted of 1167 students in all the co-educational high schools offering Advanced Level Physics in the South West Region of Cameroon. Data collected were analyzed using both descriptive and inferential statistics. For descriptive statistics, percentages and frequencies were used while for inferential statistics the Chi-square test of independence was used. The major finding of this study was that most physics teachers show a moderate equity behaviour for their students and this has an effect on their academic achievement. The conclusion was that teacher equity behaviour can improve students' academic achievement in physics.

Keywords: Equity, Gender, Inclusion, Race, Ethnic origin, Physics and Academic achievement.

INTRODUCTION

Equity refers to fairness which may require different treatment or special measures for some students or group of students. These groups are race, ethnic origin, gender and special needs. Equity has been a battle of mankind since the beginning of time because it involves the moral value of fairness. Even the youngest child understands fairness and it is often the centre of our universe and what we thrive upon. Therefore, there is no contest that equity is a barrier in education. The equity barrier affects four main groups in education: race, gender, ethnic origin and special needs.

Fielding (2006) stated that the teachers were the most important part of the entire education system since the environment that they created had a direct impact on the students in their care. All teachers need to be made aware of that impact and the potential effect it has. The effect of improved teacher support to and equitable treatment of students will have multiple effects:

- Students will perceive their teachers to be closer to their ideal and therefore view them more favourably;
- Students' self-perceptions will improve creating more self-confidence for them and a more positive perception of the classroom hence, increase in their academic achievement
- Attitude of physics students will improve, which in turn, will increase the chances of continuing with the physics in future.
- The acquisition of knowledge and skills in physics will benefit the community because it will ensure development that will make life better for all.

Given that there is a need for students to have a more favourable attitude to science if they are to continue studying it in post –high school education, this positive association has a valuable practical

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and educational significance for teachers. An increase in the simple interpersonal actions of the teacher going out of their way to help the students considering the students' feelings, talking with the students, being interested in students' problems, treating all students equitably, and moving about the class to talk to the students should bring about a more positive attitude (Fielding ,2006).

STATEMENT OF THE PROBLEM

Physics is one of the science subjects that are taught in all the high schools offering the sciences. Unfortunately, Physics results are not as encouraging as those of other science subjects. Physics has the lowest enrolment and lowest number of As, Bs and Cs grades which are considered by the G.C.E Board as good grades. This information suggests that physics has a problem. The study of physics is among the most challenging, rewarding and in our increasing technological society-pivotal field, of human Endeavour. Physics has a significant impact on our way of life and our standard of living; and whatever the future holds, there will be great need for scientists and engineers in our society. Consequently, if these trends are allowed to continue unabated, then it will certainly thwart national aspirations of producing sufficient science and technology- based on man power requirements as required by vision 2035. It is based on these students' poor performance in the summative evaluation that the researcher decided to investigate whether physics teachers' classroom equity behaviour is a significant determinant of students' academic achievement.

REVIEW OF RELATED LITERATURE

According to Breveman & Gruskin (2003) equity means social justice. Equity encompasses a process where the principle of fairness is practised. It has been said that "equity—what is fair and just—may not, in the process of educating students, reflect strict equality—what is applied, allocated, or distributed equally" according to the Glossary of Educational Reform (Equity, 2016). It is likely that the term equity will be conflated with other similar terms, according to Morton and

Fasching-Varner (2015). These authors maintain that equity is characterized by fairness and justice. They believe that the term equity implies what is in the best interest of others; however, the term might become entangled with terms such as equality, equal rights, diversity, and fairness. Schools are more than a place for students to gain a standardize education. Schools must be an incubator that grow students into productive, empathic and responsible adults. The impact that schools have on our communities affect the way our society evolves. Without sound equity practices, schools are failing students and preventing them from gaining at least the basic minimum level of knowledge, skill and proficiency. At the same time, communities are penalized by not having the most talented individuals trained for leadership and professional engagement. Equity and quality education are a bulwark against anti – democratic practices and refueling society with professional and talented individuals that can assume responsibility for leadership and professional roles in society.

According to the OECD (2012), "equity in education means that personal or social circumstances such as gender, ethnic origin or family background, are not obstacles to achieving educational potential (fairness) and that all individuals reach at least a basic minimum level of skills (inclusion)". The OECD definition can be described as incorporating diversity and social justice in its definition. According to the authors, "inclusion means ensuring that all students reach at least a basic minimum level of skills. Equitable education systems are fair and inclusive and support their students in reaching their learning potential, without either formally or informally pre-setting barriers or lowering expectations. Equity as fairness implies that personal or socioeconomic circumstances, such as gender, ethnic origin or family background are not obstacles to educational success.
It is important to note that there is a notable and distinct difference between equity and equality in education. According to the Center for Public Education (2016), equality in education is achieved when students are all treated the same and have access to similar resources. In contrast, equity is achieved when all students receive the resources, they need so they graduate prepared for success after school. Darling-Hammond, Wilhoit, and Pittenger (2014) define equity as policies and practices that provide every student access to an education focused on meaningful learning—one that teaches the deeper learning skills contemporary society requires in ways that empower students to learn independently throughout their lives. This goal is one that good schools and educational systems have for their students; however, conditions exist that prevent some students and groups of students from accessing the resources to achieve this goal. In an equitable school or education system, these skills are taught by competent and caring educators who can attend to each child's particular talents and needs and also have adequate resources available to provide the materials and conditions for effective teaching and learning. An equitable system also does not treat all students in a standardized way, but differentiates instruction, services, and resources to respond effectively to students' diverse needs so that each student can develop his or her full academic and societal potential. Heick (2018) lists 29 factors that he labels characteristics of a good school. Most of these factors are equity-based and provide quality education for children and school improvement. The 29 factors are: 1. A good school can adapt quickly to human needs and technology change. 2. A good school produces students that not only read and write but choose to. 3. A good school sees itself. 4. A good school has diverse and compelling measures of success–measures that families and communities understand and value. 5. A good school is full of students that don't just understand "much," but rather know what's worth understanding. 6. A good school knows it can't do it all, so seeks to do what's necessary exceptionally well. 7. A good school improves other schools and cultural organizations it's connected with. 8. A good school is always on and never closed. 9. A good school makes certain that every single student and family feels welcome and understood on equal terms. 10. A good school is full of students that not only ask great questions but do so with great frequency and ferocity. 11. A good school changes students; 12. A good school understands the difference between broken thinking and broken implementation. 13. A good school speaks the language of its students. 14. A good school doesn't make empty promises, create noble-but-misleading mission statements, or mislead parents and community-members with Edu jargon. It is authentic and transparent. 15. A good school values its teachers and administrators and parents as agents of student success. 16. A good school favours personalized learning over differentiated learning. 17. A good school teaches thought, not content. 18. A good school makes technology, curriculum, policies, and its other "pieces" invisible. 19. A good school is disruptive of bad cultural practices. These include intolerance based on race, income, faith, and sexual preference, aliteracy, and apathy toward the environment. 20. A good school produces students that know themselves in their own context, one that they know and choose. This includes culture, community, language, and profession. 21. A good school produces students that have personal and specific hope for the future that they can articulate and believe in and share with others. 22. A good school produces students that can empathize, critique, protect, love, inspire, make, design, restore, and understand almost anything–and then do so as a matter of habit. 23. A good school will erode the societal tendency towards greed, consumerism, and hoarding of resources we all need. 24. A good school is more concerned with cultural practices than pedagogical practices– students and families than other schools or the educational status quo. 25. A good school helps student separate trivial knowledge from vocational knowledge from academic knowledge from applied knowledge from knowledge as-wisdom. 26. A good school will experience disruption in its own patterns and practices and values because its students are creative, empowered, and connected, and cause unpredictable change themselves. 27. A good school will produce students that can think critically–about issues of human interest, curiosity, artistry, craft, legacy, husbandry, agriculture, and more–and then take action. 28. A good school will help students see themselves in terms of their historical framing, familial legacy, social context, and global connectivity. 29. A good school will improve the community it is embedded within and serves. Most of these factors support equity based and quality education. Culturally responsive teaching is also an important teaching strategy for students' success.

In culturally responsive teaching, teachers teach students using familiar themes, cultural icons, celebrations, and artifacts of one's heritage. Gay (2000), the leading expert on the topic of culturally responsive teaching (CRT), defines this method as "using the cultural knowledge, prior experiences, frames of references, and performance style of ethnically diverse students to make learning encounters more relevant to and effective for them" (p. 29). Gay (2000) lists the following characteristics of CRT: 1. It acknowledges the legitimacy of the cultural heritages of different ethnic groups, both as legacies that affect students' dispositions, attitudes, and approaches to learning and as worthy content to be taught in the formal curriculum. 2. It builds bridges of meaningfulness between home and school experiences as well as between academic abstractions and lived sociocultural realities. 3. It uses a wide variety of instructional strategies that are connected to different learning styles. 4. It teaches students to know and praise their own and each other's' cultural heritages. 5. It incorporates multicultural information, resources, and materials in all the subjects and skills routinely taught in schools. These characteristics of culturally responsive teaching are just the beginning of developing the intellectual strengths of students.

Aceves and Orosco (2014) maintain that teachers who utilize CRT practices value students' cultural and linguistic resources and view this knowledge as capital to build upon rather than as a barrier to learning. Culturally responsive teaching is a fundamental component of school equity and quality learning. Kozleski (2010) states that in culturally responsive teaching, "it is important that teachers learn about the lives and experiences of other groups in order to understand how different historical experiences have shaped attitudes and perspectives of various groups" (2010, p. 7). Students' perceptions of their school's equity can have great impact on a variety of positive outcomes. Improving equity in education and reducing school failure should be a high priority for all schools. Gorski (2016) takes a novel approach to school equity. He employs the term equity literacy to describe his work with teachers and exposing them to the knowledge and skills necessary to become, as he describes it, "a threat to the existence of inequity in their spheres of influence" (Gorski, 2016; Gorski and Landsman, 2013; Gorski and Swalwell, 2015). With his unique framing of school equity and quality as equity literacy, he promotes knowledge and skills training for teachers around equity rather than culture. In an Intercultural Development Research Association interview, Gorski gives an additional definition of equity literacy by expressing the following: The equity literacy approach is a comprehensive framework for preparing teachers and students to see the world through an equity lens. Speaking specifically about teachers, the idea is that creating an equitable classroom environment for all of my students requires a set of knowledge and skills that often are not taught in teacher education programs or even in diversity in-service sessions. This means recognizing biases and inequities, including those that are very subtle, and knowing how to respond to and redress biases and inequities in our classrooms and schools (Posner, 2015, p. 1). Rutman, Hubberstey, Barlow, and Brown (2005) also contend that students need a caring nurturing and supportive environment in order to learn better. The researcher's study focuses on primary schools in Zimbabwe. Finding reveals that teachers used vulgar language with students. Questionnaires were collected from 300 teachers and 150 teacher trainees from primary schools. Results show that mostly female teachers shout, scold and use vulgar language with students. Teachers also label students negatively in public and abuse them emotionally. The researcher, however, does not provide us with additional information on the participants such as, the sex of the teachers who filled in the questionnaire, their socio-economic background and ethnicity. We also do not know if female students or male students are more affected by this attitude. However, the study does provide us with a gender angle regarding teachers approach to students because the focus is on female teachers who abuse their students.

Nasir and Cobb (2007) based their argument on other studies and also write that male and female teachers tend to cultivate the minds of male students more than those of girls in Tanzania. Teachers, of both sexes, often discourage girls from studying math and science. They are gender-bias stereotypical in classroom management. Colclough *et al.,* (2000) also argue that in Ethiopia male teachers and in Guinea both male and female teachers have a positive view about boys and considered them more intelligent and engaged in learning than girls. In an expanded study from South Korea, Kutnick (2006) also addressed this study in teacher training, titled. Gender in Education Network in Asia GENIA (2006), the researcher collected data from four classes (2-6grade) from three elementary schools and from 1-3 grades (four 1-2 and two from 3rd grade) from two junior high schools. Researcher also interviewed 37 students (19 girls and 18 boys) and 16 teachers (11 female and 5 male). Observations were included as well. Findings indicated that there were gender biases in the manner in which teachers interacted with their female and male

students. For example, teachers of both sexes gave priority to boys. They called on them and boys were also quicker to raise their hands. However, with respect to punishment, teachers tended to be more physical with boys, claiming that they do not cry and take it as hard as girls do. With girls, teachers use more verbal punishments. Researcher also found that teachers spoke more in general male language reference than female. Myhill and Jones (2006) found through individual interviews that teachers treat more negatively boys than girls. The ideal student in the eyes of teachers has characteristics that are associated with femininity. Such perception increases with age. Students also indicate that there are higher expectations from girls with respect to behaviour and academic achievements. Teacher –student interaction works both ways. Students also bring biases into the classroom. Mayhill and Jones add that students through those female teachers are less gender biased. Nonetheless, findings suggest that students listen more to a male than a female voice. Shel's (2007) findings also suggest, that ethnicity can play a major role in the manner in which teachers socialize" with their students. For example, in her ethnographic study in Los Angeles, one of the participants was a female teacher. She was half Black and half Jewish but felt Black. She, on the other hand had complicated relationship with her only three Black male students (4th grade) in the classroom while she did not have any special conflicts with her other male students. She admitted that because she felt black, she had higher expectations from the three Black students and was less patient if they did not meet those expectations. However, she was more cordial to Black female students.

The international move towards inclusion of special needs children into mainstreaming classrooms rather than educating them in an isolated environment has been a main concern, raising issues and interest for educators, policy-makers and researchers (Rolheiser, Evans and Gambhir, 2010). For a long time, there have been arguments about which factors influence students' achievement. Some researchers attribute students' achievement to the school; others indicate that the school makes little impact on academic outcome. Other researchers say that the effective teacher is the only one who can play the main role in terms of student progress. All the factors (teacher, school context, classroom context and the community around the school all contribute or impact students' achievement. The effective school factors, which influence students' achievement are: professional leadership, learning environment, high expectations, positive reinforcement, monitoring students' progress and parent-school co-operation (Rolheiser, Evans and Gambhir, 2010). The effective teaching or teacher's characteristics are: Lesson clarity, instructional variety, teacher task orientation, engagement in the learning process and student success rate (Borich ,2000, P.8). An effective teacher in an inclusive classroom possesses such characteristics as: efficient use of time; a good relationship with students; provides positive feedback; has a high student success rate; and in general, provides support for the students with and without disabilities (Larrivee, 1985).

Nasir and Cobb (2007) in their study about the effectiveness of an inclusive outcome on students with learning disabilities, found that students with specific learning disabilities demonstrated academic progress at pace comparable to that of students who did not possess such disabilities, in addition their teachers and parents indicated progress in self-esteem and motivation. The inclusive programme was applied to grade 2 and 5 (Nasir and Cobb,2007). Vaughn, Elbaum and Schumm (1996) in their study about social relation of the students with learning disabilities in an inclusive classroom (peer acceptance, loneliness, self-concept and social alienation), found that such students demonstrated lower academic self-concept. The sample consisted of 16 students with learning disabilities, 27 with low achievement, and 21 with average/high level of achievement. The

aim of this study was to determine the social relation of the students in second, third and fourth grade in an inclusive classroom. The social relation was measured at the beginning and end of a full inclusive entire school year. (Vaughn, Elbaum, and Schumm ,1996).

In another study about the social outcome for students with and without learning disabilities in an inclusive classroom Vaughn and colleagues obtained a positive outcome. In this study the sample consisted of 185 third through six-grade students distributed between learning disabilities, average achievement and high achievement. The participants were distributed between two different settings (co-teaching setting and consultation/collaborative teaching setting). According to the results the students on the consultation/ collaborative teaching setting demonstrated a more positive outcome than their peers on the co-teaching settings. Further, it was demonstrated that there was an increase in the number of reciprocal friendships formed (Vaughn, Elbaum, Schumm, and Hughes, 1998). But in a study by Pavri and Luftig(2000) students with learning disabilities felt loneliness more so than did their peers without learning disabilities and were more controversial in their social status and less popular. In this study the sample was 15 students with learning disabilities and 68 students without learning disabilities in sixth-grade classrooms (Pavri and Lufting, 2000). Stanovich *et al.,*(1998) conducted a study about the differences in terms of academic self-concept and peer acceptance in an inclusive classroom setting; the sample was 2,011 students in second to eight grade and this sample divided to four categories students with disabilities, students that had been identified as being educationally at risk, students whose native language was not English, and other students that were not categorized). The basic finding showed that the self-concept was the lowest among the students who were categorized in comparison to students who were non categorized. Also, the students who had disabilities and those whose native language was not English demonstrated low levels of social integration compared with those who were identified as being at risk. Further, peer acceptance was significantly higher for the non-categorized students, the students who were at risk were accepted by their peers but had low perception in academic ability, and on other hand the students with disabilities rated higher in academic self-concept than in social closeness (Stanovich, Jordan, and Perot,1998). Klingner and Vaughn (1999) investigated the perception of 4659 students from preschool to 12 grades, 760 of these students with disabilities. They found that the students with - disabilities on an inclusive classroom-wanted the same books, materials, activities, homework and group teaching as their peers without disabilities and it was also found that their peers agreed with them on the terms that everyone should learn fairly. All the sample individuals recognised that their way of teaching according to individual student ability. Students appreciate a teacher who slows down the instruction, makes the concepts clear and teaches using learning strategies (Klingner and Vaughn,1999).In terms of the effects of including students with disabilities on students without disabilities, a literature review by Paterson, indicated that when students with disabilities are included in regular classrooms with their peers without disabilities 'is neither detrimental nor beneficial on students without disabilities' in respect to academic achievement, but inclusion is useful in terms of the 'social development' (Paterson ,2000, P.20).

Teaching students with disabilities in an inclusive classroom may be regarded, as a challenge for teachers accustomed to teaching in the regular classroom; therefore, teachers should acquire the basic characteristics of effective teaching. To be a successful teacher in inclusive classroom is not easy, because usually in such cases the teacher is dealing with different abilities. Most of the effective teaching evidence comes from the research which involves the

classrooms directly using several different techniques (Westwood, 1995).Westwood, in his review of the literature on the effective teacher, concluded that an effective teacher should be a good classroom manager, focusing on academic skills, with good expectation, enthusiasm, using effective strategies to keep students on task and using variety of teaching resources, styles and covering the material content. Also, the effective teacher uses easy presentation of material, is direct in teaching, explains and outlines instruction clearly, frequently observes what students are doing taking into account differences between the students and re-teaching when necessarily, gives frequent feedback for all students and checks for understanding by using probing questions. Westwood (1995) indicated that effective teachers who are able to monitor the classroom and the students' behaviour in their class also demonstrate the ability to use body language. Furthermore, they are able to manage the instruction time for the students and themselves and have good expectations. In terms of academic ability, the effective teacher has the ability to review the previous day's lesson, before starting a new lesson which is important in connecting the previous and the next knowledge for the students, also ensuring their understanding by using questions and monitoring students' progress frequently (Stenovich and Jorden,1998). Teacher's behaviour has a significant link to students' achievement (Englert, 1983 and Westwood, 1995). Englert, in a study about teacher's effectiveness, found that effective teachers had a high level of presentation and corrected student responses in a short time, also following the students' error responses and informing the students of the correct response by giving the suitable feedback. Englert (1983) indicated that effective teachers: Are enthusitic in their work, take care of the students and work cooperatively with parents. In terms of professional development, effective teachers know the students' needs and, pose high expectation, motivating the students' always, use different teaching strategies, have good communication skills, love their students and master their subject matter (Shanoski and Hranitz, 1992). Hattie indicates that expert teachers have sophisticated representation about what they teach, are able to solve problems without effecting the student's personality and take time to understand the problem, and further can also make a decision in the suitable time and identify the important decisions. Expert teachers can prepare the optimal classroom climate by following the error and giving feedback, scan the classroom behaviour effectively and monitoring learning. Expert teachers are more able to monitor students' problems and assess their understanding whilst providing feedback at the same time, they can see the difficulties facing the students and build strategies and hypotheses and examine or test these strategies and the extent to which they are working by measuring students' outcomes, they respect their students, they have responsibility over their students, they build self-concept and self-efficacy for their students, they have a positive influence on their students' outcome and lead the students through challenging tasks and they have content knowledge (Hattie,2002). Effective teachers according to Murphy and others are patient, caring, respect their students, organize their classrooms, and as result their students are enthusiastic (Murphy, Delli and Edwards, 2004).

In a study by Larrivee, a sample size of 118 teachers in primary inclusive classrooms was used, and concentration was paid to the students with learning difficulties. Larrivee collected her data using four methods: observe the classroom directly, the teachers' records, self-report from the teacher and interview the teachers and the students. The 74 variables for this study were divided into seven categories. To collect the data, she developed 14 instruments to assess all variables. She reported that students with special needs demonstrated a greater level of achievement in the mainstream classrooms when the teacher, used the time efficiently, gave

feedback, made a high rate of success for learning tasks and responded for all students positively (Larrivee ,1985). In contrast, the students who had the lowest achievement were in classrooms with a high degree of; off task actions or behaviour, waste in the time transition process, teachers criticized students' responses and when there was a low ability in terms of behaviour problems intervention (Larrivee, 1985).The extant literature suggests two general ways that the demographic matches between students and teachers could influence educational outcomes. One broad class of explanation involves what is called "passive" teacher's effects. These effects are simply triggered by a teacher's racial or ethnic identity not by explicit teacher's behaviour. The most widely discussed examples are "role-model" effects, which occur when the presence of a demographically similar trait raises student's academic motivation and expectation. A related type of passive teacher effect is the phenomenon known as "stereotype threat" (Clande , 1997). Stereotype threat refers to the possibility that in situations where students perceive stereotype might attach (e.g. black students with white teachers, female students with male teachers), they experience an apprehension that retards their academic identification and subsequent achievement. A second class of explanations for the educational benefits of own race teacher's points to "active" teacher effects: unintended biases in their expectations of and interactions with students who have different demographic traits (Ronal, Ferguson, 1998, P. 294). The available evidence on whether any of the sorts of effects exist is limited but generally supportive. Study by Clande and Joshua (1995) suggests that stereotype threats by race influence student's achievement. Does assignment to a demographically similar teacher influence that teachers' perception of the students? The results from the available empirical literature are decidedly mixed. In an influential literature review, Ferguson (1998) concludes that biases in teacher's perceptions and expectations help to sustain and perhaps even to expand, the black-white test score gap". However, he also argues that this is a problem for both black and white teachers and dismisses recommendations to match students and teachers by race as "too simple a prescription". However, other reviewers like Sabrine, Hope and King (1993) have pointed to several small studies which find that white teachers are more likely than black teachers to have negative perceptions and low expectation of black students. One possible explanation for conflicting interpretation of this limited evidence is the unintended bias that can be created by the non-random sorting of teachers and students both across and with schools. For example, in one of the law studies based on a large naturally representation survey and a rich set of background controls find relatively limited evidence that black students are evaluated more positively by black teachers in the United States of America (Ronald, Daniel and Dominic, 1999). The results presented here indicate that the racial and ethnic dynamics between students and teachers have consistently large effects on teachers' perceptions of students' performances and have an effect on their academic achievement when communicated to them. However, this type of research has not been conducted in a high school, physics classroom in South West Region of Cameroon. Since Cameroon is made up only of one race but with many ethnic groups, this research will concentrate more on ethnic differences. That is, the study intends to find out whether students are likely to be evaluated, differently by a demographically dissimilar teacher. That is, the effects of the behaviour of a physics teacher from a different ethnic origin on students' academic achievement.

THEORITICAL REVIEW

This study was guided by Connell (1990) self- system model, Carl Roger's (1951) client - centered therapy and Vygosky's(1928) socio – cultural theory.

Connell (1990) Self-System Process Model seeks to define a method that a teacher can use to increase the student's liking for a subject. This model defines the psychological functioning of youth and how students mentally process teachers' behaviours. The major components of the model include autonomy support, structure, and involvement (Connell, 1990). In each of the three dimensions of the model, teacher-student interaction occurs that has the potential to impact students' attitudes towards the subject. In the first phase autonomy support, teachers communicate to students the choices they have to make. Characteristically, autonomy related messages affect perceptions as students feel understood and supported. These feelings lead students to respond by completing a specific task related to their personal goals and values (Connell, 1990).

The second phase of the process model-structure is epitomized by verbal and non-verbal messages perceived by the receiver as "optimally challenging" (Connell, 1990, P.66). As structure-based messages are communicated, students understand what they need to do to perform well, and are cognizant of the sequences of their decision or in decision to complete an action (Connell, 1990). However, in order for structure-based messages to be effective, they need to be administrated with consistency (Connell, 1990). The third component of Connell's model is involvement and is communicated through messages that inform the receiver student that he or she is cared for and is illustrated by the statement. "I think the teacher likes me, know and care about me as a person" (Connell, 1990, P. 66). Stipik (2006, P. 46), suggests that when students perceive that their teacher cares about them, "students in turn feel that they owe their teacher something and don't want to disappoint him". Consequently, students will become academically engaged which is a fundamental precursor of students' achievement Connell et al., (1994) conclude that negative emotions such as anger, blame, denial and hopelessness accompany these behaviours and it affects students negatively. Teachers should promote positive emotions such as friendship, love, among students which will help them learn better and perform better in the formative and summative evaluations. Student's engagement is a strong predictor of his achievement and behaviour in school regardless of socio- economic status. Students engaged in school are more likely to earn higher grades and test scores, and have lower drop-out rates. In contrast, they argue, students with low levels of engagement are at risk for a variety of long-term adverse consequences, including disruptive behaviour in class, low/poor grades and scores, delinquencies and dropping out of school. From the aforementioned, teacher support (engagement) is important to student academic achievement. Students who perceive teachers as caring well-structured environment clear and fair are more likely to report high engagement in school. Consequently, high attendance and test-scores enables strongly predict whether students will successfully complete school and ultimately pursue post-secondary education and achieve economic self-reliance (Klem and Connell, 2004).

According to Roger's (1951) client centered theory, a teacher must display certain behaviours in order to facilitate learning in the classroom. These behaviours are: Realness, acceptance and empathic understanding (Roger, 1951). By realness, Roger means that the teacher should be himself or herself and not trying to be what he or she is not. That is, the teacher should be aware of his or her feelings, accept and act on them and be able to communicate them when appropriate (Roger, 1951). The teacher's behaviour should be congruent (in line) with his or her feelings. When this happens, it is said that the teacher is genuine. Roger believes that when a teacher acts this way the student sees him or her as a real person, a person with whom he can relate and trust. Therefore, positive interpersonal relationship and a positive socio- emotional climate are established in the classroom (Tambo, 2012). Roger believes that this is the most

essential in facilitating learning and high academic achievement. Communicating acceptance means that the teacher sees the student as a person of worth and trust. (Tambo, 2012). When the teacher behaves in an accepting manner the student feels trusted and respected. This feeling enhances his or her self-worth and self-esteem (Tambo, 2012). This type of behaviour creates socio-emotional climates that promote effective learning and hence increases the student's academic achievement. According to Tambo (2012) a teacher shows empathic understanding when he or she makes an effort to understand the student from the student's point of view. That is being nonjudgmental and sensitive to the student's feelings. Roger says when teachers clearly display empathic understanding; positive interpersonal relationships and socio-emotional climate will emerge in the classroom to enhance greater academic achievement.

Vygotsky (1928) Sociocultural theory views learning as inevitably embedded in cultural settings (Vygotsky, 1928,1932). Vygotsky's theory states that human cognitive development is a socially mediated process. According to Vygotsky, social interactions, especially cooperative dialogues with more knowledgeable others, are necessary for children to acquire ways of thinking and behaving that make up a community's culture. Culture means ways of thinking and behaving and seeing the world. Culture is socially constructed and changes and relates to "the multiple dimensions of the lived experiences of students" (Gonzalez, Andrade, Civil, & Moll, 2001). Because individuals participate in multiple cultural communities, culture is not static. McCarthy (1995) argues that a person's culture cannot be reduced to characteristics that are static because individual identities are constantly being constructed through the intersection of racial, class, gender, ethnic and other experiences. Vygotsky argued that such social interactions are more than simple influences on cognitive development – they actually create people's cognitive structures and thinking processes. Therefore, it is important for curriculum to build on students'' lived experiences to create cognitive learning pathways. There are always variations within groups, as well as between groups (Nasir & Cobb, 2007). This is why it is important in research to study the "shifting and relational nature of culture" (Boaler, 2007, p. 27). One way to understand culture and the relationship between culture and learning is based on the concept of communities of practice (Wenger, 1998). Communities of practice are at the center of situated learning theory, a social learning theory built upon trying to understand how people negotiate meaning. In this theory, learning is a process that involves active social participation in the varied communities of practice in which people have membership and through which they develop practice-linked identities. Communities of practice are "groups of people who share a concern, a set of problems, a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger, McDermott, and Snyder, 2002, p. 4). Teachers at a particular school form a community of practice because they share an interest in teaching children (i.e., a shared learning enterprise) and they "engage in discussion and activities, helping each other and sharing information" and are "commonly focused on a particular topic" (Buysse, Sparkman, and Wesley, 2003, p. 266). In this study, equity served as a point of focus around which to organize meaning. Teachers shared three dimensions of practice which according to Wenger make up a community of practice: "mutual engagement, joint enterprise, and a shared repertoire" (Wenger, 2003, p. 73). Mutual engagement refers to the development of relationships among the teachers in this community and the ways they engaged in developing their conceptions of equity. As a community of practice, the teachers developed a shared set of instructional practices and pedagogical knowledge around equity and physics teaching, and learning comes through experience and interaction within the context of their community of practice. Situated learning (Lave & Wenger, 1991) is a powerful framework that recognizes that learning is often reflected in the renewal and production of useful knowledge, rather than the internalization of a set and pre-existing "truth." From a sociocultural perspective, the practice of teaching abides in a complex system that is historically, politically, and socially situated. Participation in multiple contexts shapes what teachers teach, how they see themselves and how they make meaning of their work. A community of practice develops routines, artifacts, practices, symbols, slogans, histories and stories. In this way, the theory moves us away from thinking of teaching as an individual act. The community of practice makes available for teachers' certain ways of talking about and doing things. An understanding of learning as situated in communities of practice allows the researcher to consider both explicit knowledge – what teachers verbalize about their teaching practice – and the tacit knowledge that undergirds their day-to-day action in the classroom. Both what teachers say, and what they do, reflect their behaviour and has an influence on the academic achievement of the students they teach.

RESEARCH METHODOLOGY

The Research Design of this study was survey because the main aim of the study was to describe in quantitative terms the degree to which the Physics teacher classroom equity behaviour affects students' academic achievement. This was done by using questionnaire to sample the opinion of a cross-section of the students offering Advanced Level Physics in the South West Region of Cameroon. The target population of this study was made up of all the students in co-educational high schools offering Advanced Level Physics in the South West Region of Cameroon. The accessible population was made up of all the co-educational high schools, offering Advanced level Physics in Fako Division of the South West Region of Cameroon. These high schools consist of sixteen government colleges, six confessional colleges and seven lay-private colleges given a total of 29 high schools with a population of 1602.

Stratified random sampling was used to select the schools while simple random sampling technique was used to select the student to be used for this study. Data was collected using a questionnaire. The questionnaire consisted of five option Likert Scale type of statements in which the students had to indicate their degree of agreement by choosing either strongly agreed (SA), agree(A), neutral(N), disagree (DA) or strongly disagree (SD) for each of the statements by ticking his/her chosen option corresponding to each statement The validity of this questionnaire was assured by giving sample copies to some experts to review them for structure, format and content validity. The questionnaire was trial-tested to establish the reliability of the instrument in the school not used for the main study. Cronbach Alpha was used to obtain the reliability coefficient of the instrument. This instrument had an internal consistency of 0.81**.**

Table 1: Response Format and Weightings

Type of statement	Responses				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Positive statement	5	4	3	2	1
Negative statement	1	2	3	4	5

The response format and weightings of table 1 was used to score the responses on the questionnaire, convert the scores on sum of 20, before categorizing the respondents. Any respondent who ticked

strongly agree scored 5 points, agree scored 4 points, neutral scored 3 points, disagree scored 2 points and strongly disagree scored 1 point for all positive statements. The scoring guide was reversed for negative statements. Any respondent who scored 15 and above was classified as very good, between 14 and 11 that respondent was classified as good, while below 11 was classified as poor. For the dependent variable a respondent who scored 10 and above was categorized as good academic achievement, below 10 was categorized as poor academic achievement. Data collected from the field were analyzed using both descriptive and inferential statistics. For descriptive statistics, frequencies and percentages were used. For inferential statistics, the chi-square test of independence was used to verify the hypothesis.

HYPOTHESIS

This study was based on the null hypothesis which states that there is no significant relationship between physics teachers' classroom equity behaviour and students' academic achievement while the alternative hypothesis states that there is a significant relationship between physics teachers' classroom equity behaviour and students' academic achievement.

DATA ANALYSIS/RESULTS

Table 2: Analysis of the students' responses to Equity Behaviour of Physics Teachers.

Equity Behaviour	Frequency	Percentage
Poor	388	33.2
Fairly Good	573	49.1
Good	206	17.7
Total	1167	100.0

The results on table 2 shows that33.2% of the respondents said it is poor,49.1% of the respondents indicated the equity behaviour of physics teachers is fairly good, while 17.7% of respondents said that the equity behaviour of physics teachers is good.

Presentation of observed and expected frequencies relating physics teachers' equity behaviour and students' academic achievement.

Physics Teachers' Equity Behaviour	Academic Achievements		
	Poor	Good	Total
Poor	309(234.1)	79(153.9)	388
Fairly Good	247(345.7)	326(227.3)	573
Good	148(124.3)	58(81.7)	206
Total	704	463	1167

Table 3 shows that out of 704 respondents whose responses relating to academic achievements were classified as poor, 309 indicated that physics teachers' equity behaviour is poor, 247 indicated that this behaviour is fairly good, while 148 were of the opinion that equity behaviour of their physics teachers is good. Out of 463 respondents whose academic achievement were categorized as good, 79 indicated that their physics teachers' equity behaviour is poor, 326 indicated it is fairly good, while 58 indicated that it is good.

Table 4: Calculation of X^2 Value for verification of the hypothesis

Observed Frequency (0)	Expected Frequency (E)	O-E	$(O-E)^2$	$(O-E)^2/E$
309	234.1	74.9	5615.4	24
79	153.9	-74.9	5615.4	36.5
247	345.7	-98.7	9734.9	28.2
326	227.3	98.7	9734.9	42.8
148	124.3	23.7	563.1	4.5
58	81.7	-23.7	563.1	6.9
			$\sum^{(O-E)2}/E=$	142.9

X^2c = 142.9at 0.05Level of significance with 2 degrees of freedom.

RESULTS

The calculated X^2value (142.9) was greater than X^2 critical value (5.991) hence, the null hypothesis was rejected following the decision rule. Inference made leads to the conclusion that there is a significant relationship between Physics teachers' classroom equity behaviour and students' academic achievement. The magnitude of the relationship was determined by comparing the contingency Coefficient value (C.C.) = 0.33 to the contingency maximum value (C_{max}) = 0.71. Since 0.33 lies within 0.3 and 0.39, the magnitude is moderate. This implies that physics teachers' classroom equity behaviour relates moderately to students' academic achievement.

CONCLUSION

This study has shown that physics teacher classroom equity behaviour has a moderate effect on students' academic achievement. This finding is very similar to that of other scholars. For example, Numerous researchers have indicated that racial and ethnic dynamic between students and teachers have consistently large effects on teachers' perceptions of students' performances and have an effect on their academic achievement when communicated to them. In a related study, Stanovich *et al.,* (1998) conducted a study about the differences in terms of academic self-concept and peer acceptance in an inclusive classroom setting; the sample was 2011 students in a second to eight grade and this sample divided to four categories students with disabilities, students that had been identified as being educationally at risk, students whose native language was not English and other students that were not categorized. The basic finding showed that the self – concept was the lowest among the students who were categorized in comparison to those who were non-categorized. Also, the students with disabilities rated higher in academic achievement.

Equitable schools are models of deeper learning that incorporate a continuum of educational competencies for both the student and the school. Equal access is only the first step; equal treatment, appreciation of one's own culture and the cultures of others, equitable compensation and resources, and shared values that accept the presence of diverse racial, cultural, economic and social groups is just as important. Equity in schools is based on a foundation that embraces the perspective that all children can learn. This perspective recognizes, respects, appreciates, and celebrates the rich human differences that make up our diverse societies. At the school level, equity plays a vital role in broadening the base and scope of learning and teaching. The balance of learning rests in the practices of inclusion, respect and self-appreciation.

RECOMMENDATIONS

Based on findings the following recommendations were proffered:

1. Principals should encourage mentor-mentee relationship among teachers of the same department, so that experienced ones can train the new ones on what it takes to be an equity teacher.
2. When recruitment is made non-professionals should be given in-service training before actual classroom teaching on the qualities of an equity teacher.
3. Regional Pedagogic Inspectors could organize seminars/workshops to train physics teachers on the qualities of equity classroom behaviour.

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