



Teacher's Qualification and Experience on Students' Attitude towards Physics in selected Secondary Schools in Buea, South West Region of Cameroon

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ABSTRACT

The purpose of this study was to investigate how students' negative attitudes towards physics can be changed by teacher qualification and experience. That is, the study was based on the framework that, teacher qualification and experience can change physics students' negative attitudes to positive. Ex post facto research design was used in which results of Common mock of form five students were used. In the process, the results of students taught by an experienced and inexperienced teacher and two teachers with the same years of experience but with one having a higher certificate were compared. The sample of the study was made up of 41 from a population of 207 physics students of form five. This study was carried out in four secondary schools in the Buea Municipality. To select schools for this study, purposive sampling technique was employed. Simple random sampling technique was used to select the students' scores. The data collected were analyzed using student t-test for related and unrelated samples. The main findings of this study were that teacher qualification and experience can change students' negative attitude towards physics to positive. The conclusion was that, teacher qualification and experience can change students' negative attitudes towards physics to positive.

INTRODUCTION

Social psychologists have noticed that people respond to objects (ideas) with different degrees of positive to negative evaluations. Responses could be affective (e.g. frown or smiling); cognitive (e.g. stating rational thoughts) or behavioural (clapping or running away). Social psychologists conceived a driving force behind these responses and name it attitude. They proceeded to measure attitude by measuring what they conceived to be the effects of it (Ajzen, 1989). Gagne (1979) defines attitude as an internal state that influences the personal actions of an individual; he recognized attitude as a major factor in subject choice. He considers attitude as a mental and neutral state of readiness organized through experience, exerting a directive or dynamic influence upon the individual's responses to all objects and situations with which it is related. Attitudes of students can be influenced by the attitudes of the teacher and his method of teaching which are governed by his/her qualification and experience. Attitudes can also be defined as lasting evaluation of various aspects of the social world-evaluation that are stored in memory (Judd et al., 1991).

Attitudes are acquired through learning and can be changed through persuasion using variety of techniques. Attitude once established, help to shape the experiences the individual has with object, subject or person. Although attitude changes gradually, people constantly form new attitudes and modify old ones when they are exposed to new information and new experiences (Adersina & Akinbobola, 2005). Students' attitudes towards science significantly alter their achievement in science (Pavol, P; Gayei & Júha, C.2007). Therefore identification and influence of attitudes become an essential part of educational research. This study has been initiated by the idea that research in students' attitude towards science often involves science in general but particular disciplines like biology, chemistry and physics have been overlooked, this can partly camouflage students' attitudes because science is not viewed as a homogenous subject. This study is about Cameroonian students' attitudes towards physics and the role of teacher qualification and experience. When students are successful, they view the subject matter with a positive attitude because their self-esteem is enhanced. This creates a positive cycle of good performance building higher self-esteem which in turn leads to more interest in the subject and higher performance (Aleinyemi, O.A., 2009). Alao (1990) showed that there is a positive correlation between attitudes and performance in the science subjects.

Statement of Problem

Physics is the most problematic area within the realm of science, and it traditionally attracts fewer students than chemistry, biology and other science subjects. Physics is perceived as a difficult subject for students from

secondary to high school and to the university. In developed countries, it has been determined that goals of science are never fully realized, that student success in physics is lower than chemistry and biology, that students do not like science lectures and that most have no preference for science, particularly physics (Boylan, 1996; Dieck, 1997; Mattern and Schau, 2002; Neathery, 1991; Rivard and Straw, 2000). This researcher carried out a research on students' attitudes towards physics and its effects on their academic achievements in 2009. This study examined Students' Attitudes towards physics in the South West Region of Cameroon. A Likert survey questionnaire was used. 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. Data collected were analyzed using the Chi-square test of independence and the major finding was that most students have negative attitudes towards physics and this affects their academic achievement.

Secondly, almost all students who had passed through secondary school have had the opportunities of hearing some physics teachers telling their students that physics is a very difficult subject and that only the gifted or talented can study the subject. Consequently, many of the students developed negative attitudes towards the subject and drop it within the first three years of secondary school. This study will therefore examine students' negative attitudes towards physics and the role that teacher qualification and experience can play in order to change these negative attitudes to positive.

Theoretical Framework

This paper is guided by Fritz Heider(1946) Balance theory and Jerome Bruner (1966) theory of Instruction. Balance theory is a motivational theory of attitude change, proposed by Fritz Heider. It conceptualizes the cognitive consistency motive as a drive toward psychological balance. The consistency motive is the urge to maintain one's values and beliefs over time. Heider proposed that "sentiment" or liking relationships are balanced if the effect valence in a system multiplies out to a positive result. Balance theory explains how people tend to maintain consistency in patterns of their liking and disliking of one another and of inanimate objects. When patterns of liking and disliking are balanced, structures are stable. When they are imbalanced, structures are unstable and there is pressure to change in the direction that makes them balanced. In balance theory's early statements, for example in "Attitudes and Cognitive Organization" (1946), Heider was interested in the perceptions of a person, p , with respect to another person, o , and an object of mutual interest, x , which could also be a third person. Heider noted that the patterns of perceived relationships among the three entities could be in one of two states: balanced or imbalanced. Imbalanced states produce tension which may be resolved by changing the

relations or by distancing oneself from the situation. Consider three entities: p (person), o (other), and x (an object of interest). Heider identifies three possible relationships among them, L (likes), \sim L (dislikes), and U (forms a unit relationship with; i.e., is associated with, owns, or possesses). Accordingly, "p L o" means "p likes o"; "o \sim L x" means "o dislikes x"; and "p U x" means "p forms union with x."

P-O-X model

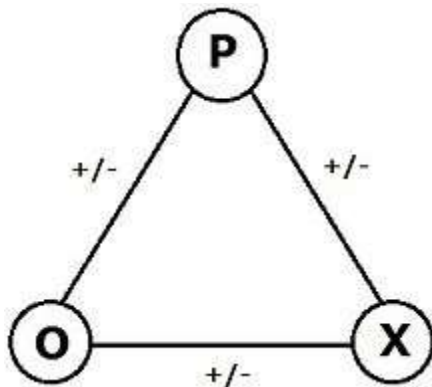


Fig 1: Heider's P-O-X model

For example: a Person (P) who likes an Other (O) person will be balanced by the same valence attitude on behalf of the other. Symbolically, $P(+) > O$ and $P < (+) O$ results in psychological balance. This can be extended to objects (X) as well, thus introducing triadic relationships. If a person P likes object X but dislikes other person O, what does P feel upon learning that O created X? This is symbolized as such:

- $P(+) > X$
- $P(-) > O$
- $O(+) > X$

Multiplying the signs shows that the person will perceive imbalance (a negative multiplicative product) in this relationship, and will be motivated to correct the imbalance somehow. The Person can either:

- Decide that O isn't so bad after all,
- Decide that X isn't as great as originally thought, or
- Conclude that O couldn't really have made X.

Any of these will result in psychological balance, thus resolving the dilemma and satisfying the drive. (Person P could also avoid object X and other person O entirely, lessening the stress created by psychological imbalance.)

To predict the outcome of a situation using Heider's Balance theory, one must weigh the effects of all the potential results, and the one requiring the least amount of effort will be the likely outcome. For examples Balance theory is also useful in examining how celebrity endorsement affects consumers' attitudes toward products. If a person likes a celebrity and perceives (due

to the endorsement) that said celebrity likes a product, the said person will tend to like the product more, in order to achieve psychological balance. So too, if a student likes a teacher teaching physics that students may develop likeness for physics so as to create a balance. However, if the person already had a dislike for the product being endorsed by the celebrity, she may like the celebrity less in addition to liking the product more, again to achieve psychological balance. Heider's balance theory can explain why holding the same negative attitudes of others promote closeness (e.g. the enemy of my enemy is my friend). Similarly, the friend of my friend is my friend. This suggests that, if a student develops likeness for a teacher and he/she is teaching physics that student is likely to develop interest for physics. This implies that teachers must develop positive attitudes towards physics and students so that they too can develop positive attitudes towards the subject.

Jerome Bruner is a psychologist who has been very influential among educators, particularly during the curriculum reform projects of the 1960s. Bruner is primarily in the cognitive tradition, although he is very heavily influenced by Piaget. Bruner views people as being active in the process of learning, continually structuring and restructuring their environment. Thus, he is quite opposed to the view of the passive learner mechanically associating stimuli and responses. Instead, Bruner believes that people selectively perceive certain aspects of their environment, represent those perceptions internally, and then act on those internal representations. Bruner has written about the course of cognitive development in which a child progressively develops three modes of representation: enactive, iconic, and symbolic. To be successful, the mode of instruction should match the mode that the learner is using. Because Bruner views learning as an active, involved process, he has been a prime proponent of the discovery learning approach. In this approach, students are presented with a problem and some evidence: they must seek to reconcile that information and "discover" the solution to the problem. Another theme in Bruner's writings is the structure of knowledge. Bruner believes that when the basic structure of a subject (consisting of the ideas, concepts, principles, and their relationships) is emphasized, the learners will be more able to improve their intuitive thinking. These qualities can only be private by a qualified and experienced physics teacher.

A major theme in the theoretical framework of Bruner is that learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so. Cognitive structure (i.e., schema, mental models) provides meaning and organization to experiences and allows the individual to "go beyond the information given". As far as instruction is concerned, the instructor should try and encourage students to discover principles by themselves. The instructor and student should engage in an active dialog (i.e., socratic learning). The

task of the instructor is to translate information to be learned into a format appropriate to the learner's current state of understanding. Curriculum should be organized in a spiral manner so that the student continually builds upon what they have already learned. Bruner (1966) states that a theory of instruction should address four major aspects: (1) predisposition towards learning, (2) the ways in which a body of knowledge can be structured so that it can be most readily grasped by the learner, (3) the most effective sequences in which to present material, and (4) the nature and pacing of rewards and punishments. Good methods for structuring knowledge should result in simplifying, generating new propositions, and increasing the manipulation of information. These four essential components of this theory can only be provided by a qualified and experienced physics teacher.

REVIEW OF RELATED LITERATURE

Teacher quality is widely regarded by stakeholders in education and researchers as the most powerful school-related influence on a child's academic performance." (Motoko, Gerald, LeTendre & Scribner, 2007). In addition, Fenster (2014) maintains that a teacher who is highly effective improves both students' academic learning in the short-term and their long-term quality of life. School is where people go to acquire knowledge, learn skills, and develop values that will make them productive citizens and help them grow to their fullest potential as human beings (Wong & Wong, 2009). The quality of the teacher in any school setting is claimed to be the most critical component for improving student achievement and closing achievement gaps. Leigh and Mead (2005), argue that the knowledge and skills of teachers are the most important factors influencing children's learning. Therefore teacher quality is considered a means towards this end. Omo (2011), notes that the dramatic effects that teachers have on students' achievement are largely undisputed. Goe(2007), maintains that teacher quality influences student performance and highlights academic qualification and experience as some of the qualities of a teacher.

A highly effective teacher improves both students' academic learning in the short-term and their long-term quality of life (Goe & Stickler, 2008). The veracity of this statement has been supported by empirical information but what have not been clear from these empirical findings are the exact characters or qualities that impact student performance. Teachers are the most important resource that a school should have to achieve greater and better results. Darling-Hammond (2000) maintains that teacher preparation and certification are the strongest factors contributing to students' achievement in reading and mathematics. Kasiisa & Bakaluba (2013) concluded that there is significant relationship between teachers' qualifications and pupils' academic performance in the primary schools in eastern Uganda.

Based on their findings, they recommended that experienced teachers with professional qualifications should teach Social Studies in Eastern Uganda. (Kosgei, Jairo, Odhiambo & Ayugi, 2013) conducted a study in Nandi, Kenya to establish the relationship between teacher quality and student achievement. They observe that teacher experience has significant impact on students' performance but also note that teacher qualification has no much relationship with students' academic achievement.

Dial (2008) conducted a study to examine whether years of teaching experience and teacher's degree level have an effect on overall achievement of students on the communication arts and mathematics sections of the Missouri Assessment Program. Descriptive statistics and factorial ANOVA was used in this study. Data was analysed from both the communication arts and mathematics sections of the Missouri Assessment Program exam from the 2005-06 and 2006-07 school years. Whereas the overall results indicated that years of experience, as well as the interaction between years of experience and degree level, had an effect on student achievement in both communication arts and mathematics inconclusive results indicated teacher degree level alone had no effect on student achievement. The study recommended that further research could be continued using future test score data on the basis of the results. Outcomes such as: amount of time spent reading for pleasure and completing homework, number of days absent, and number of repeated disruptive offenses. Partly dependent on a student's home or community environment, these behaviours reflect important facets of learned motivation, perseverance, and self-control that largely influence the future success of middle school students of North Carolina, in the United States. The results of their findings reveal a higher test-score for middle school teachers of math and English Language Arts (ELA).

According to Darling-Hammond (2000), certification status is a measure of teacher qualifications that combines aspects of knowledge about subject matter and about teaching and learning. Ashton & Crocker (1986); Evertson, Hawley, & Zlotnik (1985); Greenberg (1983); Haberman (1984); and Olsen (1985) as cited by Darling-Hammond (2000) maintain that fully prepared and certified teachers are better rated and more successful than teachers without this preparation. Evidence is drawn from research that spans across the last 30 years. Such evidence dispels populist beliefs that teaching is best learned, to the extent that it can be learned at all, by trial and error on the job. Hammond (2000) reviewed data from a policy survey covering 50 states. The aim was to examine the ways in which teacher qualifications and other school inputs are related to student achievement across states. The findings of both the qualitative and quantitative analyses suggest that policy investments in the quality of teachers may be related to improvements in student performance. Hill, Rowan & Loewenberg (2005) conducted a study to explore whether and how teachers' mathematical

knowledge for teaching contributes to gains in students' mathematics achievement. A linear mixed-model methodology was used in which first and third graders' mathematical achievement gains over a year were nested within teachers, who in turn were nested within schools. It was concluded that teachers' mathematical knowledge was significantly related to student achievement gains in both first and third grades after controlling for key student- and teacher-level covariates. Based on the research findings, it was recommended that policy initiatives should be designed to improve students' mathematics achievement by improving teachers' mathematical knowledge.

Darling-Hammond, Holtzman, Gatlin, and Heilig (2005) are cognizant of the debate surrounding questions raised by the utility of teacher education with particular focus on whether certified teachers are generally more effective than those who have not met the testing and training requirements for certification. Another question raised by the debate is whether some candidates with strong liberal arts backgrounds might be at least as effective as teacher education graduates. These questions are examined in a study using a large student-level data set from Houston, Texas that links student characteristics and achievement with data about their teachers' certification status, experience, and degree levels from 1995-2002. Data was collected to ascertain the effectiveness of Teach for America (TFA) recruits from selected universities who receive a short-term training before they begin teaching compared to experienced certified teachers. A series of regression analyses focusing on 4th and 5th grade student achievement gains on six different reading and mathematics tests was done over a six-year period. It was found out that certified teachers consistently produce stronger student achievement gains than do uncertified teachers. Additionally, the study concluded that teachers' effectiveness strongly related to the preparation the teachers had received for teaching.

In a study to assess the relationship between teacher certification and student performance, Kane *et al* (2007) used six years of panel data on students and teachers to evaluate the effectiveness of recently hired teachers in the New York Public schools. Upon classification and analysis of teachers based on their certification status in their year of hire, research findings revealed that Certified, uncertified, international, and alternative certified (AC) teachers differ along a number of observable dimensions. For instance, the fraction of teachers who are black or Hispanic was found to be lower among regularly certified teachers and TFA corps members (about 20%) than among Teaching Fellows (30%) uncertified teachers (49%), or international teachers (48%). Consequently, there is more likelihood that certified teachers and international recruits will have graduate education than other groups. Based on the research findings, it was revealed that on average, the initial certification status of a teacher has small impacts on student test performance. There were large and persistent differences among teachers with the same

experience and certification status. Such evidence suggested that classroom performance during the first two years is a predictive basis of a teacher's future effectiveness.

Adams and Krockover (1997) found teacher preparation programs as the source identified by teachers as their source for knowledge of student-centered instruction, general pedagogical knowledge including classroom routines and discipline, and pedagogical content knowledge including instructional strategies. Adams and Krockover also found teacher preparation programs provide novice teachers with a framework by which to organize, understand, and reflect on their experiences in the classroom. Clodfelter, Ladd & Vigor (2007) defined teacher preparation programs also referred to knowledge of teaching which includes the knowledge of instructional methods, learning theories, measurement and testing, and classroom management. Teacher preparation programs as defined by Stronge (2002) include a series of courses focusing on child development, instructional and assessment techniques, and methods and materials related to specific content areas. Knowledge of teaching as referred to by Darling-Hammond and Youngs (2002) are the experiences in teacher education courses or preparation experiences.

In the course of teacher education and student teaching, candidates are typically judged on their teaching skill, professional conduct, and the appropriateness of their interactions with children. In teacher preparation programs, the study of pedagogy, as referred to by Boyd, Goldhaber, Lankford and Wyckoff (2007) includes knowledge of instructional methods, learning theories, measurement and testing, and classroom management. Such materials can be offered in free-standing courses or, when it is specific to a particular subject area, woven into a subject-matter course. Primarily qualitative in nature, the studies of teacher education programs reveal mixed evidence regarding the degree to which these programs contribute to teachers' knowledge. Several studies identify the specific components of teacher education programs that are most important such as subject-specific pedagogy and classroom management. These studies offer limited evidence regarding the contribution of teacher education programs to teacher competencies or more importantly, student achievement (Rice, 2003a).

Pigge (1978), based upon questionnaire responses from 1,851 principals and 770 teachers across grade levels, found that teachers perceive that the competencies most necessary to do their work were those learned on the job. Clark, Smith, Newby, & Cook, (1985) used observational interview and survey data from 44 first year teachers and 27 student teachers from a number of different teacher education programs to study the impact of teacher education programs. Clark *et al.* (1985) found that the most frequently perceived origin of ideas for teaching practices were teachers' own ideas. The second most common sources of teaching innovations were student teacher experiences and content from teacher education courses. Taken together,

the teacher education program accounted for about one-third of the practices used by the teachers. As far as selectivity or prestige of the higher education institutions attended by teachers, the evidence suggests a modest positive effect on student performance at the elementary level, and a more significant positive effect at the high school level.

Ehrenberg and Brewer, (1994) coded the selectivity of institutions attended by teachers using Barron's six-category rating system of the admissions selectivity of the school in that year. The study found that, holding other factors constant, the average selectivity of the undergraduate institutions attended by teachers has a positive effect on students gain scores. At the elementary level the positive effect of teacher quality may be more pronounced for low-income students. Studies of extended teacher education programs suggest positive effects on the number of teachers entering the profession and teacher retention rates, but no clear effect on teacher performance, at least as indicated by principal evaluations. Andrew and Schwab (1995) compared graduates from four (144) and five (163) year teacher education programs at the same institution. Comparisons of the two groups revealed that more graduates of the five-year program entered and remained in the teaching profession than graduates of the four-year program. A number of quasi-experimental studies have been conducted on the impact of a teacher's advanced degree on teacher effectiveness. Advanced degrees have a history of showing no positive effect on student achievement, and sometimes even have negative effects for elementary student achievement. A recent wave of studies that take into consideration the subject area of the degree and teaching assignment have found a positive effect of subject-specific advanced degrees on student achievement (Rowan, Correnti & Miller, 2002). Rowan, Correnti, and Miller (2002) used survey data from Prospects: The Congressionally Mandated Study of Educational Opportunity to study the effect of teachers on elementary student achievement in mathematics and reading.

Teacher certification as defined by Clotfelter, Ladd, & Vigdor, (2007) includes credentials such as a teacher's years of experience, type of license, and licensure test score. Rice (2003b) defined teacher certification as the traditional primary gatekeeper mechanism for the teaching profession. Rice stated that the specific requirements for certification vary from country to country, but typically include the completion of an accredited and approved teacher education program, practice teaching, and a formal recommendation from an institution of higher education. Teacher certification as related to effective teaching is defined by Stronge, (2002) as relating to the educational background and to scores on some test of pedagogical, content knowledge, or both. Teacher certification was viewed by Darling-Hammond & Berry, (2006) as a combined set of qualifications such as general academic and verbal ability, subject matter knowledge and teacher education

that are measured as part of a teacher certification program. Teacher certification as viewed by Boyd, Goldhaber, Lankford & Wyckoff. (2007) always involved examinations, often in both general knowledge and teaching skills, and it nearly always involved coursework and practice teaching. Ideally certification keeps poor teachers out of the classroom, while giving people with the potential to be good teachers the authorization to enter the classroom. But certification may also have an unintended consequence.

Existing empirical studies have demonstrated a positive effect of certified teachers on high school mathematics achievement when the certification is in mathematics. This subject-specific teacher certification effect is less obvious in other high school subject areas, and the effect is zero or even negative in elementary-level math and reading (Rice, 2003b). Hawk, Coble, & Swanson, (1985) studied the effect on student achievement in mathematics of secondary teachers certified in mathematics versus those certified in other subjects. The study used a paired-comparison design, including a sample of 36 secondary school teachers certified in mathematics; 18 in-field and 18 out-of-field, and 826 students. Hawk et al.(1985) found that student achievement scores in both general math and algebra were higher for students whose teachers were certified in math. In addition, teachers certified in math demonstrated greater knowledge of the subject and scored significantly higher on the instructional presentation component of the instrument measuring professional skills. Based on this study, it appears that teacher certification in math has a positive influence on secondary school teacher performance and student achievement in math.

Darling-Hammond (2002) argued that fully prepared and certified teachers are generally more highly rated than teachers without full preparation. Goldhaber and Brewer (2000) extended an analysis of the NELS: 88 data to study the influence of different types of teacher certification on student achievement in high school math and science. They found that math students whose teachers earned the standard certification do significantly better than students whose teachers hold private school certification or who are not certified in their subject area. In contrast, they found no evidence that math and science students of teachers with emergency credentials do any worse than students whose teachers" have standard teaching credentials. But in a critique of the Goldhaber and Brewer (2001) study, Darling-Hammond & Youngs, (2002) argued that the emergency certified teachers included in the study are most likely veteran teachers, who hold some sort of licensure, for instance, those who have moved and are not fully certified in the state where they are teaching. Boyd, Goldhaber, Lankford and Wyckoff (2007) examined extensively how preparation and certification requirements influence student achievement. Boyd et al. found that teachers who score well on certification exams can improve student outcomes significantly. In addition, the study found limited evidence that

certification requirements diminish the pool of applicants, but there is not enough evidence on how they influence student outcomes.

In a related study Croninger, Rice, Rathbun & Nishio (2007) drew on data from the Early Childhood Longitudinal Study (ECLS) to analyze the relationship between elementary school teacher qualifications and first-grade achievement in reading and mathematics. Croninger et al. (2002) found that certain teacher qualifications matter. The study reaffirmed findings from other studies that have concluded that more refined measures of teacher preparation are better predictors of student achievement than are more conventional measures. Two teacher qualifications associated with significant positive effects on reading achievement next to experience are those that capture the emphasis of the coursework taken in preparation for the profession, at the school level, and the specific type of degree earned, elementary education, at the teacher level. However, broader measures like certification status and possession of advanced degrees were not found to be related positively to elementary student achievement in reading; the case of student achievement in mathematics, the relationship with possession of advanced degrees was actually negative. The results of this study are also comparable to those at the high school level that have demonstrated the importance of teachers' subject-specific degrees in mathematics and science.

Secondly, the results of this study found that teacher qualifications appear to have the strongest influence on reading achievement, arguably the focus of early elementary education. Teachers who hold elementary education degrees and have more than two years of experience teaching first grade are associated with higher student achievement in reading. Third, the results of this study revealed the importance of considering not only the individual effects of teacher qualifications but also contextual effects of teacher qualifications. Many studies have considered the importance of individual teacher qualifications on achievement; far fewer have considered the possible collective effects of hiring highly qualified teachers and their effect on student achievement overall. One possible explanation is that teachers with greater collective expertise in specific subject areas may be able to develop stronger curricular programs and provide pedagogical support to less qualified colleagues, boosting subject-specific cognitive gains school wide (Croninger, Rice, Rathbun, & Nishio, 2007).

Rice (2003b) stated that while research indicates there is a relationship between student achievement and teacher experience, at the elementary level of education, it appears that the relationship is most evident in the first several years of teaching, with some evidence of vintage effects for very experienced teachers. Rice also stated that estimates of the effect of teacher experience on high school students' achievement suggest that experience has a more sustained effect that continues later into teachers' careers. Stronge (2002) views teacher

experience as the period of time that it takes teachers to develop from novices to masters at different intervals over time, taking from five to eight years to master the art, science and craft of teaching. A set of quasi-experimental studies designed to test the causal relationship between teacher experience and student achievement reveals a positive relationship between these two variables. Hanushek, (1997) found that 29% of the estimates of the impact of experience on teacher quality were statistically significant and positive. This point was supported, also, by Greenwald, Hedges and Laine, (1996) who conducted a meta-analysis of education production function literature from which they concluded that teacher experience is, in fact, related to student achievement. Murnane & Phillips, (1981) examined a sample of Black elementary school students from predominantly low-income families in one inner-city. Murnane et al. (1981) found that among teachers in their first seven years of teaching a significant positive effect on elementary school student achievement.

The study also found a weak negative relationship between experience and student achievement among teachers with eight to 14 years of experience and a positive effect of experience on student achievement for teachers with 15 or more years of teaching experience. At the elementary level, this relationship is most evident during the first several years of teaching, and there is some evidence that positive effects re-emerge among very experienced teachers with more than 14 years of experience. Estimates of the effect of teacher experience on high school student achievement suggest that experience has a more sustained effect, continuing later into teacher's careers. Ferguson (1991) found that high school teachers with nine or more years of experience were associated with higher student scores than teachers with only five to nine years of experience. Stronge (2002) found that teachers develop from novices to masters at different intervals over time, taking from five to eight years to master the art, science, and craft of teaching. His findings support the conclusions of Rice (2003b). The aim of this study was to find out whether physics teacher qualification and experience can change students negative attitudes to positive.

RESEARCH METHODOLOGY

This study made use of the ex post factor research design. The population of this study was made up of all the form five physics students in the Buea Municipality. The target population of this study was made up of physics students from four secondary schools in the Buea Municipality. The sampled population was made up of 207 form five physics students. Purposive sampling technique was used to select the schools for the study. The simple random sampling technique was used to select the schools for the study. Regional mock results were used to compare the performance of physics students taught by experienced and inexperienced teachers and also the results of students

taught by teachers having the same years of teaching experience but with difference qualifications. The data collected were analyzed using student t-test for related and unrelated samples.

Hypotheses

This study was guided by the following two hypotheses:

1. This study was based on the null hypothesis which states that there is no significant relationship between teacher's qualification and students' negative attitude towards physics while the alternative hypothesis states that there is a significant relationship between teacher's qualification and students' negative attitude towards physics

2. This study was also based on the null hypothesis which states that there is no significant relationship between teacher's experience and students' negative attitude towards physics while the alternative hypothesis states that there is a significant relationship between teacher's experience and students' negative attitude towards physics

ANALYSIS AND RESULTS

Table 1: t-test analysis of mock results of physics students taught by teachers with low and higher qualification

Variable	N	\bar{X}_1	Df	t_{cat}	t_{tab}	Result
High Qualification	9	14.4	17	6.81	2.11	Significant
Low Qualification	10	9.5				

Table 2: t-test analysis of mock results of physics students taught by experienced and inexperienced teachers

Variable	N	\bar{X}_2	Df	t_{cat}	t_{tab}	Result
Experienced Teacher	10	13.6	20	7.45	2.09	Significant
Inexperienced Teacher	12	9.3				

Table 1 gives an analysis of mock results of physics students taught by experienced and inexperienced teachers. The analysis shows that the calculated t – value (6.81) was greater than the critical value (2.11). So the null hypothesis was rejected and the alternative hypothesis which states that there is a significant relationship between teacher's certificate and students' academic achievement and hence attitude toward physics was upheld. Similarly, from table 2, the calculated t – value (7.45) was greater than the critical

value (2.09). So the null hypothesis was rejected and the alternative hypothesis which states that there is a significant relationship between teacher's qualification and students' academic achievement and hence attitude toward physics was upheld. The above results are convening because research has shown that students' academic achievement is related to his/her attitude towards physics. These findings are supported by previous studies, for example, a descriptive study using post-hoc data set was carried out in Nigeria to examine the number of qualified teachers and its relationship to students' academic performance in public secondary schools. Twenty-one (21) public secondary schools, one in each Local Government Area (LGA) from a population of thirty-one (31) LGAs in Osun State, Nigeria were sampled. The Senior School Certificate Examination results from 2000/01 to 2004/05 data were analyzed using ANOVA and Spearman rank correlation coefficient to test the three operational hypotheses (Akinsolu, 2010). Findings of this study revealed that teachers' qualifications, experience and teacher–student ratio were significantly related to students' academic performance. The researcher recommended that the findings could be used to guide planners about the need for hiring qualified teachers for effective teaching. Kasiisa & Tamale (2013) studied the impact of teacher's qualification on the performance of Primary social studies in Eastern Uganda. A cross-sectional survey design was adopted with a sample size of 128 Senior Primary Schools social studies teachers. The research findings revealed that students taught by teachers with higher qualifications performed better than those taught by teachers with lower qualifications. Based on the research findings, it was recommended that experienced teachers with professional qualifications should teach Social Studies.

Abe (2014) studied the effect of teachers' qualification on students' performance in mathematics. Three hundred students were randomly selected from ten schools out of sixteen schools on purpose in Ikere Local Government Area of Ekiti State. The criterion for the selection of mathematics teachers was based on teacher qualification. T-test statistic was used to test the three hypotheses in the study. According to the results, there was a significant difference in the performances of students taught by professional teachers. The difference was also registered between students taught by NCE (Nigeria Certificate in Education) teachers and B.Sc Ed. Teachers and also between B.Sc teachers and B.Sc Ed. teachers. In its recommendation the study suggested that only qualified mathematics teachers should be allowed to teach mathematics at the secondary school level. Furthermore, the study recommended that holders of lesser qualifications such as Nigeria Certificate in Education (NCE) be allowed to proceed in their education either through part-time or study leave. In the same vein the study recommended that teachers without teaching qualification should be advised to pursue their Post Graduate Diploma in Education (PGDE). This may

improve their teaching method in order to improve the performance and attitude of students in mathematics.

CONCLUSION

From the analysis of table 1, the calculated t – value (6.81) was greater than the critical value (2.11). So the null hypothesis was rejected and the alternative hypothesis which states that there is a significant relationship between teacher's qualification and students' academic achievement and hence attitude toward physics was upheld. Similarly, from table 2, the calculated t – value (7.45) was greater than the critical value (2.09). So the null hypothesis was rejected and the alternative hypothesis which states that there is a significant relationship between teacher's qualification and students' academic achievement and hence attitude toward physics was upheld. These findings are supported by results of other studies, for example, in a related study, Yala and Wanjohi (2011) and Adeyemi (2010) found that teacher's experience and educational qualification were the prime prediction of students' academic achievement and hence their attitudes towards the subject. The evidence from the existing research of the relationship between quality teaching and student achievement is very compelling from the standpoint that the condition of a school building such as structural, cosmetic and technology items combined with the level of quality teaching such as a teacher's verbal ability, years of experience, certification, content knowledge and knowledge of pedagogy do influence student achievement. A summary of these studies points to the fact that teacher qualification and experience are significant determinants of physics teacher effectiveness and his ability to change students' negative attitudes to positive.

RECOMMENDATIONS

From the findings and conclusions drawn from the study on the physics teachers' qualification and teaching experience on students attitudes towards physics, the following recommendations are offered; Educational administrators should equip the regional pedagogic inspectors with sufficient pedagogic didactic materials that they can use to train or carry out in-service training for the teachers doing seminars/workshops. In addition, principals should encourage mentor-mentee relationship among teachers of the same department, because this will help train the novice teachers. When recruitment is made for degree holders who have not passed through faculty of education or college of education, in-service training should be given to them before they are posted to schools.

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