Teacher Effectiveness and Academic Performance of Physics in Secondary Schools in Entebbe Municipality. A C ross-sectional study.

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Abstract

Background:

The study was about teacher effectiveness and students' academic performance focusing on Physics in Secondary Schools in Entebbe Municipality. The study was guided by the following objectives; to determine how teacher's mastery of content and ability to teach affect students' performance in physics in Secondary Schools in Entebbe Municipality, to determine the performance of students in physics in Entebbe municipality, and to find out if there is a significant relationship between teacher's effectiveness (teacher's mastery & ability to teach) and performance in physics in Entebbe municipality.

Methodology:

A survey research design with quantitative and qualitative research approaches was used, and the data was collected using a questionnaire and interview guide from 100 respondents.

Results:

The results for objective one indicate a moderate grand mean of 3.40 and a standard deviation of 1.064. The results from objective two show that with a low grand mean of 2.610 and a standard deviation of 0.938. Generally, the findings in objective three on the relationship between Teacher effectiveness and Academic performance of physics revealed that with N=100, P value=0.203 and Sig. 0.005.

Conclusion:

There is no significant positive relationship between a teacher's effectiveness and the academic performance of students in physics.

Recommendations:

The school administration should ensure that the more senior teachers can help the junior ones to learn how to best teach physics, adopt the use of ICT tools and digital game-based learning to make physics learning interesting, there is need to employ the techniques of differentiating between students to help them become better performers as individuals and there is need to adopt the use of the flipped classroom model, encourage cooperative learning, effective communication among the teachers and with students, build rapport with the parents/caregivers.

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1. BACKGROUND TO THE STUDY

The background comprises the historical, conceptual, theoretical, and contextual perspectives;

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1.1. Historical Perspective

The significant advance in our knowledge about teachers was made possible by administrative datasets that track teachers' effectiveness in teaching a subject or subjects, and measures of student achievement (Boe, E. and Gilford, D., 1992). As Aaronson et al., (2007) wrote, such datasets became much more widely available after the passage of the No Child Left Behind (NCLB) Act in 2002 in the USA because No Child Left Behind required the administer annual academic assessment tests in reading, science, and math for every child in grades three through eight by the 2005-06 school year. Anderson (2013) noted that NCLB data ushered in a wave of teacher research that has subsequently led to a policy environment today focused on reforming the human capital policies that govern the teacher workforce.

Medley et al., (1984) describe briefly the modern history of teacher efficacy/effectiveness, that period from the turn of the twentieth century to about 1980. The study of teacher effectiveness has been determined in the following overlapping period which is the search for great teachers, inferring teacher quality from student learning, and examining teaching performance. To Grant & Gradwell, (2009), since the beginning of the twenty-first century, teacher effectiveness appears to be entering a new phase of disequilibrium; that is, a transition to a period of evaluating teaching as professional with knowledge and tactics to make students pass examinations as well as their behavior.

Lee (2002) stated that the teacher's beliefs and practices are ultimately at the heart of student success. Teacher effectiveness is the expectation that a teacher possesses the talent and abilities to bring about student learning, which is central to school reform. Motivation, a building block of Teacher Effectiveness, influences teachers: performance, commitment, and retention. Furthermore, it is with this motivation, filtered through the levels of efficacy, that teachers determine what type of impact they will have on students (Tucker et al.., 2005) in line with that, teachers have been trained in refresher courses to master the content in physics.

1.2. Conceptual Perspective

The study was based on teacher effectiveness and academic performance of Physics in Secondary Schools in Entebbe Municipality. The independent variable was conceptualized to include the teacher's mastery of the subject, and the teacher's ability to teach and explain effectively and efficiently. The dependent variable included students' academic performance and scores and moderate variables were; working environment, students' willingness to learn, students' attitude towards the subject, and teacher's capabilities

Self-effectiveness is the self-belief of teachers in their capabilities and the trust they have in their methodologies to accomplish tasks. Teachers with a greater sense of self-effectiveness beliefs are more willing to experiment with new methods of teaching to meet the requirements of their students. Thus, a sense of effectiveness in a teacher has a strong positive impact on student performance (Gosky, 1988; Tschannen & Woolfolk, 2001) and if teachers have a low sense of self-efficacy, their students will show poor performance.

Albert Bandura (1977, as cited in Lee, 2002), widely known for his extensive research on the complex and multidimensional constructs of Teacher Effectiveness and its effect on behavior, noted that effectiveness develops over time through an individual's sense of competence to complete a task or attain a goal. The outcome expectancy of the individual predicts his or her behavior based on the interpretation of information received from four major sources: mastery of experience, vicarious experiences, verbal persuasion, and physiological states. Mastery of experience, the most powerful source to impact behavior, is grounded in previous results and accomplishments. With each additional success or failure, the individual either raises or lowers his or her perceived level of competency.

According to Borman et al., (2001), performance is defined as how effective something or someone is at doing a good job. Every organization has a set of overall preferred results that it wants to accomplish. The results might be implied to its members or explicitly conveyed to them. That is true, whether the organization is

large or small. It is true for any of the parts of the organization that are working towards their results, for example, a department, program, team, or an individual in the organization.

1.3. Theoretical Perspective

This study was guided by the self-effectiveness theory of Albert Bandura (1977)

According to the self-effectiveness theory, beneficial change can be brought about by experiences of mastery arising from successful performance. Bandura has proposed that phobic behavior is influenced more by self-effectiveness judgments than by outcome expectations. Bandura argues that a person's self-effectiveness can be improved by those psychological procedures, which enhance the level and strength of self-efficacy. Implicitly, he states that an exposure procedure is not a necessary condition to obtain therapeutic change.

According to Bandura, perceived self-effectiveness through performance successes depend on various personal and situational factors, for example, the difficulty of the task, the number of effort subjects expend, and the temporal pattern of their successes and failures. More recently, Bandura extended the self-effectiveness theory by stating that phobic anxiety derives from both low self-effectiveness for performing overtly, and from low self-effectiveness for exercising control over scary thoughts about Physics and Physics on the side of the students, though not on the side of the teacher. Overall, self-effectiveness seems a powerful measure in predicting dysfunctional behavior. The self-effectiveness mechanism has received considerable support from research in describing the relationship between what subjects think they can manage and what they can manage both before and after treatments for phobic complaints. This theory helped the researcher in examining Teacher Effectiveness and students' academic performance focusing on Physics in Secondary Schools in Entebbe Municipality.

1.4. Contextual Perspective

The class teacher's role has a huge impact on the learning process of students. Teachers are vital for the success or failure of an educational system; they implement the policies of an education system on the ground. If the teachers are competent, they will impact students' performance. Teacher competency is based on self-effectiveness (beliefs on own abilities) and lack of self-effectiveness causes many psychological problems such as low confidence level and low self-esteem. Bandura (1997) defines self-effectiveness as the organization of social, technical, and behavioral skills to achieve targets. Self-effectiveness in the context of teaching refers to the ability to determine the outcomes of the student's work.

Tournaki and Podell (2005) published records of more than 300 teachers about the influence of their behavior on student success and teacher vision and predictions about students. Self-effectiveness highly influences an individual's actions, effort, and way of accomplishing tasks resulting in enhanced abilities and making one more confident about the desired results. Bandura (2002), states that forethought and outcome expectations can help to master a situation and achieve the desired targets. It has been noticed that teachers with a high level of self-effectiveness have a positive attitude toward everything. Teachers with a high level of self-effectiveness are open to new methods and can adopt new techniques.

2. METHODOLOGY

2.1. Research Design

The research was carried out following a survey research design. The survey research design was chosen because it put into consideration constraints of cost, was created quickly, administered easily, and helped the researcher to collect information on a wide range of issues that include personal facts, attitudes, past behaviors, and opinions.

The quantitative and qualitative research approaches were used since they attach numerical values to respondents' views/narratives. But the researcher used more of the qualitative approach because much of the data were opinions, views, and descriptions of the study variables by the respondents.

2.2. Study Population

The study drew respondents from among the members of staff (whether they handle Physics or not), School administrators, and students. The distribution of the respondents is as shown in table 1 below:

2.3. Sample Size

The sample size is based on the formulae set by Miles & Huberman (1994) n

1+N

Where n = the required sample size

N= the study population

e = the level of significant co-efficient

n = N1+ N (0.05)

1601+0.4

=**114**, the sample for this study will comprise 114 respondents

2.4. Sampling Methods

The researcher used the snowball, simple random, purposive sampling, and census sampling methods in this study; Simple random sampling was used to select staff. According to Amin (2005), a simple random sampling is a sample obtained from the population in such a way that samples of the same category had an equal chance of being selected at the same level for example members of staff such as teachers and students. The researcher applied judgmental/ purposive sampling about which respondents to choose and pick only those who best met to have privileged information required in this study.

2.5. Data Collection Procedure

The purpose of the study. In this study, purposive sampling was applied to School administrators and teachers of Physics who were believed

The researcher obtained a letter of introduction to go to the field from the Dean of the School of Education of the University of Kisubi which was handed over to the authorities at the selected Schools seeking permission to be allowed to carry out the study in that organization.

2.6. Data Collection Methods

The research study applied the following data collection methods: The survey methodology was guided by principles of statistics from the moment of creating a sample, or a group of people to represent a population, up to the time of the survey results analysis and interpretation. The following steps were included in the process of conducting a survey, as well as several questions to ask one's self during each step, that was clarifying the purpose, formulating survey goals, verifying the resources, choosing a survey method, performing the sampling, writing the questionnaire, administering the questionnaire, processing and storing data, analyzing and interpreting the survey results, making a conclusion and reporting the survey results.

2.7. Interviewing

The researcher used the interview method involving face-to-face interviews which had the distinguished advantage of enabling the researcher to establish rapport with potential participants and therefore gained their cooperation. The interview method was hoped would yield high response rates in survey research since structured interviews were used when all the questions were drafted and a respondent was asked to clarify in case an ambiguous answer is given. Face-to-face interviews were held with the members of the school administration and management. All interviews were carried out before the appointment with the concerned respondents. The interviews had specified time limits of approximately 15 to 25 minutes. All interviews were carried out with the help of an already-prepared interview guide and were recorded alongside the respective questions.

2.8. Data Collection Instruments

Several instruments were used for data collection and these including; a self-administered questionnaire and an interview guide.

2.9. Self-Administered Survey Questionnaire.

The researcher used the questionnaire on all categories of respondents because it helped to collect large amounts of information from a large

Table 1: **Distribution of the Study Sample**

Category of respondents	Target population	Sample	Sampling techniques
School administrators and teachers for Physics	14	08	Purposive sampling
Members of staff	60	44	Simple random sampling
Students	86	62	Simple random sampling
Total	**160**	**114**	

Source: primary data, 2018

number of people in a short period, and it was relatively cost-effective, quick, and easily quantifiable by the researcher to analyze the data and to compare the findings for clarity. Structured or closed questions were meant to save the respondents' time and get definite answers and unstructured or open-ended questions were meant to ensure that respondents' feelings were not disregarded and further explanations were made. The questionnaires were delivered to respondents in person. Questionnaires were distributed after the initial communication with the respondents to seek consent. The respondents were given a maximum of one week to answer the questionnaires after which the questionnaires were collected by the researcher for analysis and interpretation of findings. No public postal service or email services were used to distribute questionnaires.

The questionnaire contained simple structured questions that the respondents/research assistant was able to fill in by writing short answers and a checklist that includes questions that require the respondent to answer; Strongly Disagree (SD), Disagree (D), Not Sure (U), Agree (A) and Strongly Agree (SA). The questionnaire had three sections; Section A; contained respondents' biodata, Sections B, C, and D contained variables of the study and respondents' suggestions. The objective questions were guided by a five-point Likert scale as shown in table 2 below.

2.10. Interview Guide.

The researcher set questions to guide the oral/mouth-to-mouth interactions between the researcher and the respondents. The data collected by this instrument was more correct compared to the other tools that were used for data collection. The tool was good to use since the researcher himself asked the respondents to give more information that was necessary for the study, thus yielding more informative data from the field.

2.11. Validity of the instrument.

Validity can be defined as the degree to which a test measures what it is supposed to measure. There are three basic approaches to the validity of tests and measures as shown by Rosenberg & Yates (2007). These were content validity, construct validity, and criterion-related validity. In this study, content validity is what was emphasized.

According to Newman et al., (2013), content validity, or definition validity and logical validity, can be defined as the ability of the selected items to reflect the variables of the construct in the measure. This type of validity addresses the degree to which items of an instrument sufficiently represent the content domain. It also answers the question that to what extent the selected sample in an instrument or instrument items is a comprehensive sample of the content.

This type of validity provides preliminary evidence on the construct validity of an instrument (Anastasi A., 1988). The content validity Index is computed as the number of experts giving a rating of "very relevant" for each item divided by the

Table 2: Likert Scale

Valid	Questionnaire Scale	Value	Mean Range	Interpretation
	Strongly Agree	5	4.21-5.00	Very high
	Agree	4	3.41 -4.20	High
	Not Sure	3	2.61- 3.40	Moderate
	Disagree	2	1.81- 2.60	Low
	Strongly Disagree	1	1.00- 1.80	Very low

No, source Field data, 2022

total number of experts. Values range from 0 to 1 where CVI $>$ 0.79, the item is relevant, between 0.70 and 0.79; the item needs revisions, and if the value is below 0.70 the item is eliminated.

CVI = The number of very relevant
The total number of items
CVI 21
22
CVI = 0.954

2.12. ***Reliability of the instrument***

Peterson (1982) defines reliability as the extent to which measures are free from errors, thus the greater the reliability of an instrument, the less likely the errors of measurement to occur. More than one data collection instrument was used to eliminate the weaknesses inherent in each instrument. The reliability of a research instrument concerns the extent to which the instrument yields the same results on repeated trials.

The researcher set questions in the data collection tools which were tested twice on students, teachers, and the researcher to enable the researcher to get a logical sequence of data. Middleton (2021) notes that when researchers measure a construct that they assume to be consistent across time, then the scores they obtain should also be consistent across time. This study used the Test-retest reliability which showed the extent to which this was the case regarding teachers' effectiveness and academic performance of physics in secondary schools in Entebbe municipality. Minimum Cronbach's alpha scale recommends a coefficient of 0.7 and above. Therefore, the instrument was regarded as reliable at a reliability scale of 0.820 (Amin, 2005).

This meant that any good measure of teachers' effectiveness would produce roughly the same scores for this individual next week as it does today regarding performance, which is a sign of consistency.

2.13. Data Processing

After data has been collected, it needs to be presented in a way that communicates the information and enables conclusions to be drawn (Merriam, Sharan B., 2009). Data were collected from both primary and secondary sources, processed, analyzed, and presented. The data collected was edited; coded and quantitative ones were tabulated into frequency tables while the qualitative ones were accumulated under specific themes.

2.14. Data Analysis

The researcher used qualitative and quantitative data analysis techniques for qualitative data, the analysis was carried out through using exploratory and descriptive methods while quantitative data was analyzed through descriptive statistics mainly percentages.

2.15. Ethical Considerations

For any research to be valid and objective, it has to take into consideration the ethical aspects while carrying it. In this study, confidentiality was observed and kept by the researcher for all information given by the respondents. The researcher was honest in his work by avoiding any form of falsification, misrepresentation, plagiarism, and any other form of academic malpractice that could hinder the dependability of the data

Table 3: **Reliability Test**

Valid	Cronbach's Alpha	No of Items
	0.954	21

No=22, source Field data, 2022

collected. The researcher reported the actual findings without omission and added personal information to distort the information. Participation in the research was voluntary, based on consent to avoid the collection of wrong data and other inconveniences to the researcher. The researcher was non-discriminative when selecting samples. This was implemented by avoiding bias in selecting respondents according to their sex, tribe, and even culture. Thus, the researcher gave all the people equal chances of being chosen.

3. PRESENTATION, ANALYSIS, INTERPRETATION, AND DISCUSSION OF FINDINGS.

Response Rate

3.1. Respondents' Bio-Data

Questions about the basic data about the person completing the survey are given common name particulars which are usually placed at the beginning of the questionnaire. Although additional questions seem redundant or irritating to respondents, they play a fundamental role in the advanced analysis of test results because it is the particulars that allow the use of data on respondents to carry out an even more accurate and advanced analysis of the collected data. In this case, there is a focus on the gender or sex of respondents, the age range of respondents, and respondents' level of education, and so on as displayed in this section;

Table 5: Respondents Bio-Data

Age of respondents in years		Frequency	Percent	Valid Percent
Valid	Less than 25years	59	59	59
	26-35years	18	18	18
	36-45years	13	13	13
	46-56years	8	8	8
	56years and above	1	1	1
Sex of respondents				
Valid	Female	49	39	39
	Male	51	61	61
Respondents'' title		Frequency	Percent	Valid Percent
Valid	Head Teacher	5	5	5
	Teachers	35	35	35
	Others (Students)	60	55	55
	Total	100	100	100
Academic qualification (Highest level attained)		Frequency	Percent	Valid Percent
Valid	PhD	1	1	1
	Masters	8	8	8
	Bachelors	20	20	20
	Diploma	11	11	11
	Others	60	60	60
Duration of service at current school		Frequency	Percent	Valid Percent
Valid	Less than 5years	45	45	45
	5-10years	32	32	32
	11-16years	18	18	18
	17years and above	5	5	5
Duration of service in Wakiso District teaching service		Frequency	Percent	Valid Percent
Valid	Less than 5years	15	37.5	37.5
	5-10years	16	40	40
	11-16years	6	15	15
	17years and above	3	7.5	7.5

No=100, Field data, 2022

3.2. Age Range of Respondents.

Regarding the age range of respondents, 59% were aged below 25 years including students and some members of staff, 18% were aged 26 to 35 years, 13% were aged 36 to 45 years, 8% were aged 46-56 years, and 1% was aged 56 years and above. Though most respondents were aged between less than 25 years and 45years, all respondents including the more experienced teachers and administrators provided critical and senior analysis of the operations of the schools and the nature of the relationship between teachers and students, and how this affects the performance in physics subject in their various schools. But all the respondents availed data for this study which supported the presentation, analysis, and discussions of findings in this study.

Table 4: Response Rate

Number of respondents	Actual respondents	Percentage
114	100	87.7

Source: Field data, 2022

3.3. Gender/Sex of Respondents

Regarding the gender/sex of respondents, it was discovered that 49% of the respondents were female and 51% were male. This shows that slightly more staff, students, and school administrators who took part in the study were males, although their number did not necessarily outstrip that of females. But for the study, the respondents and opinions of both male and female respondents were vital and the data they provided in this study is thus significant in ensuring that the study can be accomplished.

3.4. Respondents' Title in the School

Regarding the respondents' titles in the school, 5% were head teachers, 35% were teachers including those who handle physics in their respective schools and 60% were students. All these respondents were stakeholders in the education/academic programs of their respective schools including being teachers and learners of physics, so all the respondents in their respective academic attainment could avail data for this study as shown in the later presentation, analysis, and discussions.

3.5. Respondents' Level of Education

Regarding the respondents' level of education (education qualification or highest level attained), 2.54% had attained Doctoral education, 20% had Master's education including the administrators and some teachers, 50% had Bachelor's degree education and 27.5% had a Diploma education, however, all the respondents in their respective academic attainment could avail data for this study as shown in the later presentation, analysis, and discussions.

3.6. Length of Time the Respondent had been at the Current School.

Regarding the Length of time, the respondent had been at the current school, 44% of the respondents had been and dealt with academic affairs for less than 5 years, 32% had worked and dealt with academic affairs for 5 to 10 years, 18% had worked and dealt with academic matters for 11 to 16 years and 5% had worked and dealt with academic issues for 17 years and above. Though the respondents and varying periods of years spent in education service, nevertheless all of them were able to provide positive and reliable data for this study.

3.7. Length of Time one had Served

Regarding the Length of time one had served in Wakiso District teaching service, 37.5% of the respondents had served in the district education system for less than 5 years, 40% had served in the Wakiso education system for 5 to 10 years, 15% had served in Wakiso education system for 11 to 16 years and 7.5% had served in Wakiso education system for 17 years and above/worked and dealt with academic affairs for 5 to 10 years, 18% had worked and dealt with academic matters for 11 to 16 years and 5% had worked and dealt with academic issues for 17 years and above. Though the respondents and varying periods of years spent in education service, nevertheless all of them were able to provide positive and reliable data for this study.

Findings in table presents findings on how teacher effectiveness in terms of teaching affects students' performance in physics in Secondary Schools in Entebbe Municipality. The respondents agreed that the teachers can deliver the right content to the student/students which improve the desire to study and perform well in physics. But the performance in physics is still

Table 5: **How Teacher Effectiveness in-terms of Teaching Affect Students' Performance in Physics in Secondary Schools in Entebbe Municipality**

Descriptive Statistics	N	Mean	Std. Deviation
The teacher's ability to deliver the right content to the student/students improves the desire to study and perform well in physics	100	3.27	1.448
The teacher's use of relevant learning materials in the teaching activity which improves learning of physics	100	2.82	1.158
The teacher's good knowledge of the subject improves student's ability to learn and understand physics		3.07	0.902
The teacher's effective physical interaction with student/students in class improves students understanding and performance in the subject	100	3.94	0.952
The teacher who creates an environment that respects, encourages and stimulates student'/students' learning help them to perform well in physics	100	3.57	0.498
The teachers' ability to provide timely and continual feedback to learners improves performance in physics	100	3.59	1.288
The teachers who provide rewards and recognition to students for improved performance encourage the entire class to like learning the subject which boosts performance	100	3.66	1.103
The teacher's mastery of physics ensures the students learn and improve test and examination scores	100	3.30	1.159
Grand Mean and Standard Deviation	100	3.40	1.064

No=100, Source: Field data, 2022
Legend: Very low (1.00-1.79), Low (1.80-2.59), Moderate (2.60-3.39), High (3.40-4.19) Very High (4.20-5.00)

low and leaves a lot to be desired because much of the teaching and delivery of the subject matter is done theoretically, yet many of the students cannot relate or transform theory into practical aspects, hence they have limited chances of mastering the use and application of the knowledge gained.

Further, still, there are few science teachers in secondary schools, and even those teachers available have huge teaching loads which compromise their ability to produce excellent results even when they have good knowledge of the subject. The performance of physics subjects owes a lot to the physical interaction and support that the teachers afford to the learners. They give them tasks and allow them to consult individually and in teams or groups so that they can get extra explanations and opportunities to practice. The academic results may still be so wanting but the students tend to learn the practicals and excel in them so that they get the skills to do work, though they may not pass the examinations with high grades.

The results indicate a moderate grand mean of 3.40 and a standard deviation of 1.064 which indicates that teacher effectiveness is vital in making students pass physics. Hence, a teacher, who creates an environment that respects, encourages, and stimulates students'/students' learning helps them to perform well in physics but this has not yet taken root in secondary schools in Entebbe.

The results suggest that teachers are a deep underlying factor in the performance of the learners. Teachers who create an encouraging, stimulating,

and ambient academic environment have been able to gradually get fair and good results from their learners internally and externally. So, teachers as stakeholders in making learners get good results through their relevant efforts in teaching and guiding in class as they are directly involved with the learners/students more, so their ability to create a good tenable environment drives performance high. Even though the schools want results to be very good and excellent, with Physics, little has been achieved towards this. But as much as teachers put in a lot of effort in teaching Physics, the weak results do not reflect the effort. Even for the teachers who provide timely and continual feedback to learners to try and improve performance in physics, the rate of improvement is so slow and sluggish that higher grades are hard to come by in most cases. But the students get the opportunity to understand and ask questions for clarity, motivating them to like and understand the subject, though more still needs to be done in this direction to make it a darling subject to all. Teacher's mastery of any subject by the teacher is very crucial if he or she is to provide true and adequate content for the learners to understand and prepare adequately for the examinations; but this is not the case in many schools, a fact that has left many learners unable to obtain distinctions and higher credits (Credit 3 and Credit 4) in the subject, as many scores between Credit 5 to Failure 9.

The findings are consistent with Philip (2007), who suggested that learning is a consequence of experience, he argued that education and teaching should focus on the creation of an appropriately nourishing experience by the teacher so that learning comes naturally and enviably. And Woolfolk (1998) adds that the teacher needs self-effectiveness to manage the class well, and if teachers accomplish the task, self-effectiveness will increase while a low level of teachers' self-effectiveness leads to failure. The most influential source of self-effectiveness information is said to be the mastery-level experiences of the teacher accumulates. Further, Leithwood et al., (1999, as cited in Ross & Gray, 2006) point out that there is vicarious learning which involves learning from others' experiences, especially from the successes of other teachers. These success stories generate positive thoughts among other teachers and motivate them to do something different and creative, and become more committed to teaching, thus making the learners better. So, with not many teachers being proficient, yet the teacher's mastery of physics would ensure the students learn and improve test and examination scores, it is not the case with most schools in Entebbe Municipality, weak grades still dominate the mark sheets.

3.8. The Performance of Students in Physics in Entebbe Municipality

Students' performance in any subject, particularly physics appears to be linked with connecting with teachers' preferred delivery and communication styles to make the learners understand the subject matter. The more like their teachers the students are, the better their performance. Reinforcing new knowledge and skills is recognized as an important component of training. If connecting better with students is tied to performance, teachers who learn how to shift their delivery methods may foster better outcomes. Below are the presentation, analysis, and interpretation of findings on the performance of students in physics in Entebbe municipality

The study findings in Table 6 on the performance of students in physics in Entebbe municipality, according to respondents, it was strongly agreed that many of the students have a bias that the subject is hard. This is exacerbated by the low personal or self-esteem among the students which make them regard the subject to be for the most endowed or the intelligent, so some students accept early that they are not fit to pass the subject, so even with internal examinations and tests, the scores continue to be quite low. Physics performance in internal and external mocks and Uganda national examinations Board Examination at both O-level and A-level is not impressive at all, but better teaching and encouragement needs to be done to the students to make them improve on the subject in a limited period.

The results show that with a low grand mean of 2.610 and a standard deviation of 0.938, it is

Table 6: **The Performance of Students in Physics in Entebbe Municipality**

Descriptive Statistics	N	Mean	Std. Deviation
Students perform well in internal physics examinations and tests	100	2.66	0.945
The students perform well in external physics examinations	100	1.99	0.732
The performance of learners in physics is determined by teacher mastery of physics	100	3.27	1.448
The performance of students in physics is influenced through drawing examples from one another	100	2.50	0.628
Grand Mean and Standard Deviation	100	2.61	0.938

N=100, Source: Field data, 2022
Legend: Very low (1.00-1.79), Low (1.80-2.59), Moderate (2.60-3.39), High (3.40-4.19) Very High (4.20-5.00)

clear that teachers have been able to try to master (knowing and learning better) Physics, but have achieved less, not so competent with many, but highly competent with a few. Those who have learned and mastered well the teaching of physics can deliver in class the right subject content including the concepts and notes, many students are getting enticed to study the subject, except with calculations, which many students are not good at and tend to fail them, so they often get low marks as a sign of weak performance in the theory areas, but with practical content, they tend to perform slightly better as it is the opportunity for hands-on, making it easier for them to follow the concepts. But the overall performance in the subject is still relatively low and needs to be rebooted through training more teachers and availing scholastic materials. The students are not known to employ maximum effort in trying to learn the subject. This is because also most of the teachers are not observed to be involved in discussing and practicing the subject.

The findings are not consistent with Olatunji et al. (2006), Agharuwhe et al. (2009), and Odunsanya (2010) who noted that teacher's utilization of relevant and appropriate instructional materials has a statistically significant effect on students' academic performance in the university. The emphasis on the use of appropriate and relevant instructional materials during classes becomes crystal clear when one is aware of the fact that learners acquire information through the five senses, but even for learners being potent and teachers ensuring that they carry out effective teaching has not significantly led to improvement in physics learning and performance. Therefore, not many students in secondary schools in Entebbe Municipality are not known to be involved in discussions and other academic activities which stimulate learning.

The findings in Table 7 on the other factors that influence or determine students' performance in physics revealed that respondents agreed that classroom structure and instructional delivery may result in better cognition for students and or problems in dealing with students who bring home-life baggage to school, and on the downside, they see their success as their ability to shut up and listen to the teacher.

The findings further show that a moderate grand mean of 3.52 and a standard deviation of 1.331 indicates that, the teachers are predominantly built-in in their orientation, failure of which will create an incapable one, but learning is only enhanced when teacher-student relationships are strong which indicates that relationship building is a crucial and integral part of how teachers can respond to students effectively. The aspects of personality indicate preferences for interaction by students to learn (interacting with the teacher

Table 7: **The other Factors that Influence or Determine Students' Performance in Physics**

Descriptive Statistics	N	Mean	Std. Deviation
Classroom structure and instructional delivery	100	3.35	1.313
Intrinsic nature of teachers in their orientation	100	3.36	1.337
When teacher-student relationships are strong	100	3.60	1.371
Nature of student and teacher traits and character	100	3.76	1.304
Grand Mean and Standard Deviation	100	3.52	1.331

No=100, source: Field data, 2022 , Legend: Very low (1.00-1.79), Low (1.80-2.59), Moderate (2.60-3.39), High (3.40-4.19) Very High (4.20-5.00)

or instructor to learn). With assertiveness and responsiveness, analytical, drive, amiable and expressive students tend to be good performers, and on the negative side, many find themselves, are not good performers in the subject.

The findings are consistent with Knaus (2013) who states that moreover, students who have strong extrinsic orientations are more apt to respond to external rather than internal activities and demonstrate low priority for grades and school programs, in favor of action and fun. Their need for socialization during the school day may explain why they prize relationships with others like themselves. In response, teachers need to adapt to student learning preferences to connect with them more effectively. In addition, Myers (1962) pointed out, aspects of extraversion or introversion, information including sensing or intuition, decisions including thinking or feeling, and structure including judging or perceiving are one set of components that determine the traits of the learners has not led to significantly led good performance in physics, though on their positive side, there is a possibility to learn more and perform better.

The Strategies for Improving the Teaching of Physics to Improve Students' Academic Performance in Secondary Schools in Entebbe Municipality

The study findings on the strategies for improving the teaching of physics to improve students' academic performance in Secondary Schools in Entebbe Municipality are presented, analyzed, and interpreted in this section.

The findings in table 8 on the strategies for improving the teaching of physics to improve students' academic performance in Secondary Schools in Entebbe Municipality revealed that respondents strongly agreed with school administration including the head teacher, deputy head teachers, Director of Studies, Heads of departments constitute the planning committee which gathers ideas, maps out strategies which they discuss and communicate with the staff so that they can enhance teaching and performance in physics, for example, having extra lessons, remedial lessons, targeted teaching, giving tests and examination more often to stimulate learning and understanding of physics.

So constructive programs to boost teachers' performance such as capacity building, and on-the-job training would help the teachers to learn better techniques of teaching physics, and other efforts aimed at capacity building like seminars, workshops, refreshers courses, and upgrading makes the teachers better after acquiring more effectiveness and mastery of physics, so they become better teachers which would enhance students' performance. It is still a huge improvement in this area on the side of the schools and teachers.

Generally, the findings indicate a high grand mean of 4.18 and a Standard deviation of 0.678 which implies that the school administration and teachers should assign extra effort in teaching and learning physics by providing additional or extra time during the evening, Prep-time and on week-

Table 8: **The Strategies for Improving the Teaching of Physics in Order to Improve Students' Academic Performance in Secondary Schools in Entebbe Municipality**

Descriptive Statistics	N	Mean	Std. Deviation
The school administration sets academic aims and goals for teachers to achieve better grades through their students enhance performance in physics	100	4.22	0.416
Enhancing teacher expertise in teaching improves students' performance in physics	100	4.05	0.626
On job training for teachers improves their professional development which is essential in enhancing student performance	100	4.01	0.785
Enhancing teacher ownership of the subject skills improves teacher effectiveness	100	3.93	0.714
Teacher's ability to reach culturally diverse students enhances student's performance in physics	100	4.33	0.792
The school administration and teachers assign extra time and effort in teaching and learning physics	100	4.52	0.502
The teachers' implementation of innovative teaching ideas is vital to enhance the teaching and improving grades in physics	100	3.89	1.014
Boosting team teaching enables the students to learn from different teachers and also ensures the effectiveness of teachers as they interact to improve students' performance	100	4.48	0.577
Grand Mean and Standard Deviation	100	4.18	0.678

No=100, source: Field data, 2022; Legend: Very low (1.00-1.79), Low (1.80-2.59), Moderate (2.60-3.39), High (3.40-4.19) Very High (4.20-5.00)

ends more so with candidates and semi-candidates to make them understand the subject more and better. With added time for learning, they can improve their current grades, so the extra time can be beneficial if well utilized to tutor the students and help them handle the areas they need to improve in. in addition, teachers can innovate techniques and material that can easily attract the attention and make it easy for their students to master physics concepts and practices.

The findings are consistent with Ross (2007) who emphasized the provision of professional development that would influence teacher effectiveness through improved instruction for student achievement. Through professional development, teachers are provided opportunities to become experts in research and reflection, contribute ideas as students as well as be recognized for them, and practice and implement innovative techniques. Researchers with the North Central Regional Educational Laboratory (NCREL; as cited in Slick, 2002) deemed professional development essential to school reform. In effective schools, teachers and leaders have allied with the establishment of these professional learning communities where teachers have ongoing opportunities to work within a network of support systems. But on the contrary, Tucker et al., (2005) noted that some teachers admit inadequacies in their efforts to teach students from diverse backgrounds, making it hard to achieve high grades. However, teacher capacity building and providing better-structured teacher training programs would boost teacher effectiveness in teaching physics.

3.9. The other ways the Teachers Teach Physics Better for Students' Understanding.

The classroom is a dynamic environment, bringing together students from different backgrounds with various abilities and personalities. Being an effective teacher, therefore, requires the implementation of creative and innovative teaching strategies to meet students' individual needs. The study findings on other ways the teachers teach physics better for students' understanding include improving visualization in learning, promoting cooperative learning, adopting inquiry-based instruction, using the differentiation technique, deploying and implementing technology in the classroom, implementing an effective behavior management strategy, engaging in regular professional development programs, using the flipped classroom model, communicating with colleagues on staff, communicating regularly with parents, creating a welcoming environment. The study findings on the other ways the teachers teach physics better for students' understanding are presented in table 9.

The findings in table 9 on the other ways the teachers teach physics better for students' understanding revealed that respondents strongly agreed to the various ways physics can best be taught for instance helping the students to understand how their schooling applies in the real world by using the interactive whiteboard to display photos, audio clips, and videos, as well as encouraging them students to get out of their seats with classroom experiments and local field trips, encourage students of mixed abilities to work together by promoting small group or whole class activities, solving calculations, conducting scientific experiments and acting out short drama sketches are just a few examples of how cooperative learning can be incorporated into classroom lessons, posing thought-provoking questions which inspire the students to think for themselves and become more independent learners, deploying the differentiation technique where the teacher differentiate their teaching by allocating tasks based on students' abilities, to ensure no one gets left behind.

With the results showing a high grand mean of 3.67 and a standard deviation of 0.833, it implies that the schools ought to first improve the existing infrastructures before they can adopt technology in the classroom setting, since incorporating technology into teaching is a great way to actively engage the students, especially as digital media, implementing an effective behavior management strategy is crucial to gain the students' respect and ensure students have an equal chance of reaching their full potential, but the existing education system does not allow for that because of the limited staff and desire to have numbers regardless of the discipline levels, but this can be managed when standards are boosted in the schools and more staffing and motivation is done. Adoption of flipped classroom model may be a good proposition, encouraging the less experienced teachers to improve their lessons with more experienced colleagues, communicating with fellow teachers which is extremely important as well as communication with students' parents.

The finding is consistent with Ross and Bruce (2007) who pointed out that highly efficacious teachers are noted as high goal selection, high exertion of effort, persistence, high student achievement, improved instructional practice, willing implementation of innovative teaching ideas, mutual classroom control with students, stimulation of student autonomy, close monitor of lower ability students, improvement of student self-concept, motivation triggered even by failure, acceptance of personal responsibility for successes and failures, resourceful, self-reflective, and victorious over external challenges.

On the contrary, though, Klem & Connell, (2004) emphasized that the success of their children in school depended on advocacy with the schools on how parents can become partners in the active education of their children. But, the gist is to ensure that teachers are capable to be the masters of the subject in order to teach it effectively and efficiently. These teachers are driven by a do whatever-it takes mentality and are noted for their enthusiasm and commitment to teaching. Their optimistic perception trickles down to their students and establishes a direct link to student performance.

Table 9: The other ways the Teachers Teach Physics Better for Students' Understanding

Descriptive Statistics			
	N	Mean	Std. Deviation
Improve visualization in learning	100	4.01	1.010
Promote cooperative learning	100	4.19	0.677
Adopting inquiry-based instruction	100	3.65	0.809
Using the differentiation technique	100	3.29	0.518
Deploying and implementing technology in the classroom	100	4.08	0.692
Implementing an effective behavior management strategy	100	3.94	0.694
Engaging in regular professional development programmes	100	3.80	1.206
Using the flipped classroom model	100	4.01	1.096
Communicating with colleagues on staff	100	3.34	0.670
Communicating regularly with parents	100	2.71	1.122
Creating a welcoming environment	100	3.34	0.670
Grand Mean and Standard Deviation	100	3.67	0.833

No=100, source: Field data, 2022; Legend: Very low (1.00-1.79), Low (1.80-2.59), Moderate (2.60-3.39), High (3.40-4.19) Very High (4.20-5.00)

Table 10: **The Relationship Between Teacher Effectiveness and Academic Performance of Physics.**

Correlations			
		Teacher effectiveness	Academic performance of physics
Teacher effectiveness	Pearson Correlation	1	0.203
	Sig. (2-tailed)		0.040
	N	100	100
Academic performance of physics	Pearson Correlation	0.203	1
	Sig. (2-tailed)	0.040	
	N	100	100

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

The results of the correlations on the relationship between Teacher effectiveness and Academic performance in physics revealed that from Pearson Correlation, N=100, P value=0.203, and Sig. 0.005, shows that there is no significant positive relationship between teachers' effectiveness and the academic performance of students in physics. This, therefore, shows that the hypothesis (H0 which states that, "there is no relationship between teachers' effectiveness and academic performance of physics in secondary schools in Entebbe municipality" is true because much as teachers can adequately obtain mastery of the subject, prepare for the class well, the stereotypes that physics is for intelligent students, that it is a hard subject, the lack of adequate and necessary physics infrastructures in schools, the lack of an adequate number of teachers, the teachers being the major motivators of learners to like and pass physics and low motivation for teachers which af-

fect their effectiveness have kept the performance in the subject low; but other factors beyond teach effectiveness can also impact on student's performance in the subject which may include exposure to online information, demand by the school administration, the effectiveness of students in learning the subject and the level of poverty in homes.

4. SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

The results for objective one indicate a moderate grand mean of 3.40 and a standard deviation of 1.064 which indicates that teacher effectiveness is vital in making students pass physics. Hence a teacher, who creates an environment that respects, encourages, and stimulates students'/students' learning helps them to perform well in physics but this has not yet taken root in secondary schools in Entebbe.

The results from objective two show that with a low grand mean of 2.610 and a standard deviation of 0.938, it is clear that teachers have been able to try to master (knowing and learning better) Physics, but have achieved less, not so competent with many, but highly competent with a few. Also, the findings further show that a moderate grand mean of 3.52 and a very low grand standard deviation of 1.331 indicates that, the teachers are predominantly built-in in their orientation, failure of which will create an incapable one, but learning is only enhanced when teacher-student relationships are strong which indicates that relationship building is a crucial and integral part of how teachers can respond to students effectively.

Generally, the findings in objective three indicate a high grand mean of 4.18 and a Standard deviation of 0.678 which implies that the school administration and teachers should assign extra effort in teaching and learning physics by providing additional or extra time during the evening, Prep-time and on weekends more so with candidates and semi-candidates in order to make them understand the subject more and better.

With the results showing a high grand mean of 3.67 and a very low grand Standard Deviation of 0.833, it implies that the schools ought to first improve the existing infrastructures, adopt technology in the classroom setting, implement an effective behavior management strategy crucial to gain the students' respect and ensure students have an equal chance of reaching their full potential, but the existing education system does not allow for that because of the limited staff and desire to have numbers regardless of the discipline levels, but this can be managed when standards are boosted in the schools and more staffing and motivation is done.

The results show that the null hypothesis, (H0) which states that, "there is no relationship between teachers' effectiveness and academic performance of physics in secondary schools in Entebbe municipality" is true because much as teachers can adequately obtain mastery of the subject, prepare for the class well, the stereotypes that physics is for intelligent students, that it is a hard subject, the lack of adequate and necessary physics infrastructures in schools, the lack of an adequate number of teachers, the teachers being the major motivators of learners to like and pass physics and low motivation for teachers which affect their effectiveness have kept the performance in the subject low. So other factors beyond teaching effectiveness can also impact students' performance in the subject which may include exposure to online information, demand by the school administration, the effectiveness of students in learning the subject, and the level of poverty in homes are very significant in attempting to make students pass physics.

5. Conclusion

The study concludes that teacher's mastery of physics is very crucial if they are to provide true and adequate content for the learners to understand and prepare adequately for the examinations, and much as much has not been proved on this, there is a need to constantly improve in this area so that the learners can get the best information and perform in the subject well. The per-

formance in external mocks and Uganda national examinations Board Examination at both O-level and A-level is not impressive which calls for more teaching and encouragement needs to be done to the students to make them improve on the subject in a limited period of time.

The classroom is a dynamic environment, bringing together students from different backgrounds with various abilities and personalities. The teaching strategies or methods and techniques that a teacher will use to support their students through the learning process; a teacher will choose the teaching strategy most suitable to the topic being studied, the level of expertise of the learner, and the stage in their learning journey. There is a need to use interactive when technology so that students can physically engage during lessons as well as instantly research their ideas, which develops autonomy for instance use of mobile devices such as tablets can be used in the classroom for students to record results, take photos/videos, or simply as a behavior management technique. Being an effective teacher, therefore, requires the implementation of creative and innovative teaching strategies in order to meet students' individual needs.

6. Recommendations:

On how a teacher's mastery of content and ability to teach affect students' performance in physics in Secondary Schools in Entebbe Municipality, the school administration should ensure that more senior teachers can help the junior ones to learn how to best teach physics, and adopt the use of ICT tools and digital game-based learning to make physics learning interesting.

Regarding the performance of students in physics in Entebbe municipality, there is a need to employ the techniques of differentiating between students to help them become better performers as individuals.

And regarding whether there is a significant relationship between teacher's effectiveness (teacher's mastery & ability to teach) and performance in physics in Entebbe municipality, there is a need to adopt the use of the flipped classroom model, encourage cooperative learning, effective communication among the teachers and with students, build rapport with the parents/caregivers as well as creating a welcoming environment for learners to like the subject.

7. Areas for Further Study

The following are the areas for further study; mindset change and creativity in learning among the secondary teachers in Entebbe Municipality. The contribution of personality matters and academic outcomes for students at university levels in Uganda, and the contribution of learning technologies in enhancing Problem-solving in the teaching of science in Uganda.

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May God bless you All

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9. ACRONYMS

COVID 19 : Corona Virus Disease-2019
EM : Entebbe Municipality
FAS : Family Advocate System
Freq. : Frequency
KTC : Katabi Town Council
NCREL : North Central Regional Educational Laboratory
PLC : Personal Learning Communities
PPD : Provision of Professional Development
SET : Self-Empowerment Theory
SFS : Socioeconomic family status
HTE : High Teacher Effectiveness
TTL : Teacher's Transformational Leadership
UACE : Uganda Advanced Certificate of Education
%age : Percentage

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