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**Teacher Related Factors Influencing Use of Programmed
Instruction Time in Public Secondary Schools in Machakos
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P.O. BOX 170-90200, KITUI**Abstract**

Teachers play a key role in any form of schooling. On the other hand, instruction time is a core component of effective schooling. The purpose of this study was to investigate teacher related factors influencing use of programmed instruction time in secondary schools in Machakos County. The study employed descriptive survey research design. Random sampling technique was used to select a sample of 177 teachers. A questionnaire for teachers was the main research instrument. Quantitative data obtained was analysed using Statistical Analysis Software – STATA 11 while qualitative data was analyzed by use of themes as per the objectives. Content analysis based on themes was employed for open-ended questions while the hypothesis was tested at .05 level of significance. The findings of the study revealed that teacher related factors influencing use of programmed instruction time in secondary schools include teachers' attitude towards their work, teacher motivation, teacher remuneration, teacher absenteeism, and access to adequate teaching and learning resources. The study recommends that the government should increase funding to the education sector to facilitate recruitment of more teachers, it should improve their remuneration and hence their motivation as well as facilitate access to teaching and learning resources and materials. The study is of benefit to the Ministry of Education and school administrators towards improving use of programmed instruction time in public secondary schools.

Key words: Programmed instruction, time use, teacher related factors, Public Secondary Schools

Introduction

Education is an effective tool for laying a firm foundation for socio-economic development, as well as breaking the cycle of poverty of any nation (Yelkperi, 2012). Time is a very important educational resource that guides every activity within the school, and thus ought to be effectively managed in order for educational objectives to be timely achieved (Olawolu, 2011). Several studies have made a distinction between various types of school time as; allocated school time-time when students are supposed to be in school, allocated class time-time when students are supposed to be in classroom, instruction time -time that should be devoted to formal instruction, engaged time-time when students are supposed to be paying attention to a learning task, and lastly academic time which is time when students are actually devoted to learning (Silva, 2007; DeStefano, 2010). DeStefano (2010) further notes that the amount of instruction time that ends up as engaged or academic learning time depends on several factors which may be related to school management or pedagogical skills of the teacher, and greatly influence how teachers utilize it.

A study by Guajardo (2011) in Pakistan pointed out that ever increasing workload, low remuneration, lack of incentives, weak accountability and little support from the school administration, affect how teachers use instruction time. The study also mentions constantly changing policies, poor management as well as few or poor learning materials and facilities as other factors that affect how teachers use instruction time. In Tanzania, the quality of education in Government schools is sub-standard because teachers have a low morale to work effectively due to low salaries (Julitha, 2010). On the other hand, the World Bank Report established that low teacher remuneration often causes teachers to resort to secondary employment activities leading to increased absenteeism (Rogers & Vegas, 2009).

Evidence shows that high rates of teacher absenteeism lowers productivity of instruction time in the poorest developing countries in Africa and South East Asia, and suggests the need to close this gap for such countries to progress both in education and economically (Lavy, 2010). In Kenya, a study conducted by ToshibaMax in Taita Taveta and Machakos counties and reported by Business daily Newspaper dated August 2015, revealed that the levels of teacher absenteeism in the two counties stood at 17% and 12% respectively (Odhiambo, 2015). The report further states that some teachers absentee themselves from school so as to engage in other secondary businesses thereby affecting use of programmed instruction time, the resulting effect being low students' academic performance. This finding concurs with the report by the Global Monitoring Report – Education for All (EFA) 2000-2015 which reported that close to 40,000 out of 200,000 school teachers abscond classes.

When teachers fail to attend to all their lessons, the time scheduled for instruction during that period is wasted. World Bank report on reducing teacher absence and providing incentives for performance by Rogers (2009) established that other than teacher absenteeism, many schools in developing countries face many other challenges that affect how instruction time is used. These include lack of enough facilities; equipments and text books, and that a large proportion of teachers are poorly trained as well as lowly motivated. A study by Kamunge (2012) established that teacher shortage in Kenya leads to large class sizes which affects how teachers use programmed instruction time.

Purpose of the Study

The main purpose of the study was to investigate the influence of teacher related factors on use of programmed instruction time in public secondary schools in Machakos County. The specific objectives of the study were as follows:

- i. To establish if teacher absenteeism influences use of programmed instruction time use.
- ii. To establish the influence of teachers' attitude towards teaching on use of programmed instruction time in public secondary schools
- iii. To find out how teacher motivation influences use of programmed time in public secondary schools.

- iv. To determine the influence of teacher training on use of programmed instruction time in public secondary schools.
- v. To assess the influence of teacher remuneration on use of programmed instruction time in public secondary schools.
- vi. To determine if access to teaching/learning resources influences use of programmed instruction time in public secondary schools

Study Hypothesis

There is no significant influence of teacher related factors on use of programmed instruction time in public secondary schools in Machakos County.

Literature Review

Literature related to the influence of teacher absenteeism, teachers' attitude towards teaching, teacher motivation, teacher remuneration, teacher training, and access to teaching/learning resources on programmed time use was reviewed.

Teacher Absenteeism and its Influence on Programmed Instruction Time

It is estimated that students lose approximately 20 days programmed for instruction in an academic year due to teacher absenteeism (Corey, 2012). Teacher absenteeism is said to be a major wastage of programmed instruction time in developing countries, with the levels of absenteeism ranging from 11% in Peru, 21% in Indonesia, 30% in Senegal; 27% in Uganda and 30% in Kenya (Abadzi, 2007). According to Rogers and Vegas (2009) teacher absence from class slows down student learning in developing countries. The study goes on to state that substitute teachers in most of these countries are unavailable and combining classes when one teacher is absent is usually not possible because of the already existing large class sizes. Further, the study argues that where the school has only one teacher, the school must close entirely when that particular teacher is absent. On the same note, in Zambia, Das (2007) correlated students' learning gains with the absence of a teacher and concluded that each additional 5% increase in teacher absence reduces learning by 4 to 8 percent of the annual learning for a typical student which has a surprisingly large effect.

In Kenya, studies have established that teacher absenteeism lowers student learning (Chang'ach, 2011; Gathanya, 2014). It reduces the amount of time programmed for instruction leading to lack of timely syllabus coverage (Ubogu, 2004). It also affects the quality of education by reducing the number of hours scheduled for classroom instruction (Wanzala (2015). These findings prompted the researchers to carry out the current study in Machakos County, Kenya.

Teachers' Attitude towards Teaching and use of Programmed Instruction Time

A study carried out in Nigeria by Edomwonyi-Otu (2011) pointed out that most teachers do not enter the profession out of choice and thus regard it as a stepping stone for other careers and as a result they lack passion for it. In Kenya, teachers tend to have a low morale which creates a negative attitude towards their work (Chang'ach, 2011). According to Taaliu (2012), teachers' negative attitudes towards their profession result mainly from the fact that many who join the teaching profession do so as a last resort after failing to make it to their dream careers. Such an attitude makes teachers consider their work as a burden and thus fail to plan for their lessons leading to ineffective instruction time use in the classrooms. This is despite the fact that proper lesson planning increases effectiveness of presentation and delivery of concepts as observed by Reche et al (2012), and translates to better usage of classroom time and thus the concern for the current study.

Teacher Motivation and Programmed Time Use

Sicclair (2008) defines teacher motivation as that which attracts individuals to teach, the duration they remain in their initial teacher education courses and there after in the teaching profession, and the extent to which they practice teaching as a profession. Low teacher motivation leads to absenteeism which means lessons go untaught, poor utilization of instruction time in the classroom, professional misconduct which may lead to suspension of a teacher hence time wasted. According to Guajardo (2011), reliance on the traditional teaching methods such as lecture methods which do not use time optimally as well as lack of lesson preparation contribute to poor usage of classroom time. In Kenya, Taaliu (2012) established that low motivation affects how secondary school teachers in Meru County use instruction time, an argument which prompted the researchers to carry out this study in Machakos County.

Influence of Teacher Training on Instruction Time Use

A study by Edomwonyi-Otu (2011) established that most graduates from other professions opt for teaching due to lack of jobs in their relevant fields of study. They therefore lack proper training and pedagogical skills in lesson preparation and classroom time management. In Ghana, Abadzi (2007) found that in rural areas, most teachers neither follow the prescribed weekly timetable nor keep track of time that should be spent in various topics throughout the year, while some do not know certain topics well. The study further reveals that teachers who teach multiple subjects get confused and end up teaching sections of the syllabus that has already been taught, while some lack knowledge on how much time to allocate to particular topics. The study goes on to say that in low income countries, training and supervision of teachers rarely focuses on proper use of allocated time or on time planning, and that presence of unqualified teachers especially in rural areas often results in loss of instruction time as these teachers lack the necessary training on classroom time use. On the same note, Kamunge (2012) concurs with this by asserting that most teachers have pedagogical challenges especially in the area of instructional time management.

Influence of Teacher Remuneration on Use of Programmed Instruction Time

In Pakistan, research established that unattractive salary makes many of the teachers to adopt ways and means of supplementing or increasing their income at the expense of teaching as most of them use the time programmed for instruction to manage their income generating activities (Khan, 2008). It is argued that teachers in many African countries work in challenging conditions with poor remuneration whose payment is usually delayed (Adedeji, 2011). For example in Nigeria, Edomwonyi-Otu (2011) observed that poor remuneration distracts teachers from their primary role of teaching as they get immersed in activities that consume teaching time to generate income in an attempt to boost their living standards. In Tanzania, a study on analysis of teacher's low payments by Lyimo (2014) concluded that poor pay and delays in the payment of allowances lead to teachers being accorded a low status in the society. The study goes on to reveal that some teachers resort to economic activities during learning hours to earn some extra income, while some drop out of the profession due to poor pay thus creating teacher shortage. In Kenya, Taaliu (2012) mentioned that inadequate salary affects how teachers manage learning time. The current study set out to establish the extent to which these arguments apply in Machakos County.

Access to Teaching/Learning Resources and Instruction Time Use

Access to learning resources is a key factor in managing programmed instruction time in the classroom. Pupil /textbook ratio is a significant measure of education quality while scarcity of textbooks leads to loss of instruction time (Abadzi, 2007). Textbooks enable students to follow teachers' sequence of presentation and help them understand lessons more easily (Ubogu, 2004). Children need to access textbooks, supplementary readers and other reading materials in order to practice reading at home and school, which improves their reading skills and saves on time that would be used by the teacher to read during instruction (Gathenya, 2014).

However, several studies have established that most schools lack adequate learning and teaching resources. In Nigeria, Ogbondah (2010) argues that inadequate funding of schools results into lack of instructional materials, which impacts negatively on teaching and learning especially on time use by teachers. In Ghana, Amua-Sekyi (2010), suggested that availability of teaching and learning resources such as slides, flow charts among others can make students participate in the learning process, an indication that learning time is being well utilized.

Research Methodology

The study adopted a descriptive research design to investigate the extent to which teacher related factors influence programmed instruction time in Public Secondary Schools in Machakos County. A questionnaire was used to collect data. The target population were secondary school teachers in Machakos County. Stratified random sampling was used to classify schools into three categories thus: boys only, girls only and mixed secondary schools. For each category, a simple random sampling technique was used to obtain (3) pure boys schools, (3) pure girls schools and 43 mixed schools. The researchers then obtained 30% of the total number of teachers from each strata which gave a total of 177 teachers as shown in Table 1.

Table 1: Sample Size

Type of School	No. of Schools	Sampled Schools	No. of Teachers	Sample Size
Single boys school	3	3	94	29
Single girls school	5	5	86	26
Mixed schools	43	13	410	123
Total	51	21	590	177

The study employed descriptive statistics to summarize and present data. STATA 11 was used for data analysis. Quantitative data was analysed using frequency, percentages, tables and charts. Qualitative data was analysed using themes based on objectives. The null hypothesis was tested using Wilcoxon Signed Rank Sum Test at a 0.05 level of significance.

Results and Discussion

Based on the research objectives, the study sought information on the influence of selected teacher related factors on use of programmed instruction time.

Teachers' Attitude towards teaching

The researcher sought to establish the respondents' attitude towards teaching. Data obtained was presented in Table 2.

Table 2: Teachers' Attitude towards Teaching

Response	Frequency(%)	Percentage
Agreed	33	19.29
Neutral	27	15.79
Disagreed	111	64.92
Total	170	100.00

Data obtained and presented in Table 2 shows that majority of the respondents, 33 (19.29%) in the category of agreed indicated that they have a negative attitude towards teaching while 111(64.92%) in the category of disagreed indicated that their attitude towards teaching was positive, 27 (15.79%) were neutral. From the

findings, it is clear that most teachers have a positive attitude towards teaching as indicated by majority of the respondents. However, a significant proportion (19.29%) who have a negative attitude may perhaps be those who join the teaching profession as a last resort after failing to pursue their dream careers and therefore lack passion for the job as found out by Taaliu (2012). The significance of information on teacher's attitude towards teaching is that it influences how teachers use classroom time and hence, as Chang'ach (2011) observed, tends to have a negative impact on student's academic achievement.

Teacher Motivation

The study endeavoured to find out whether teachers are motivated to teach. The results were presented in Table 3.

Table 3: Teacher Motivation

Response	Frequency	Percentage
Agreed	39	23.36
Neutral	39	23.35
Disagreed	89	53.29
Total	167	100

The results presented in Table 3 show that more than half of the respondents, 89 (53.29%) in the category of disagreed said that they were not motivated to teach, 39 (23.36%) in the category of agreed indicated that they were motivated to teach while 39 (23.35%) had neutral views. These findings indicate that most teachers are not motivated to teach as indicated by most of the respondents who disagreed. This is despite majority of them indicating that they have a positive attitude towards teaching as shown in Table 2.

Teacher motivation and attitude towards teaching influence each other as found out by Chang'ach (2011) that low morale among teachers creates a negative attitude towards their work. Teacher motivation is crucial as satisfied teachers tend to concentrate on their work thus ensuring maximum use of learning time (Reche et al, 2014). On the other hand, lack of it is likely to lead to absenteeism, poor use of classroom time, professional misconduct among other vices as observed by Guajardo (2011).

Teacher Renumeration

Perhaps teachers' low motivation is influenced by low renumeration. Based on this finding, the study sought to find out teachers' views as regards their renumeration. The results were presented in Table 4.

Table 4: Teacher Renumeration

Response	Frequency	Percentage
Agreed	36	21.17
Neutral	39	22.94
Disagreed	95	55.89
Total	170	100

Data presented in Table 4 shows that majority of the teachers 95 (55.88%) in the category of disagreed indicated that they are poorly renumerated, 36 (21.17%) in the category of agreed said they were well renumerated, while 39 (22.94%) were neutral. From these findings, it is evident that teachers are poorly renumerated as indicated by the majority (95 or 55.89%). This finding concurs with Guajardo (2011) and

Taaliu (2012) that teachers' salaries are usually low. Perhaps those who indicated that they are well remunerated (36 or 21.17%) are likely to be those who indicated earlier that they are motivated to teach (39 or 23.36%).

Access to Adequate Teaching and Learning Resources

Adequacy of teaching and learning resources has a direct effect on teaching and learning as observed by Schneider (2003), whereas scarcity of these resources often reduces classroom instruction time (Abadzi, 2007).

The respondents were asked to indicate whether they have access to adequate teaching and learning resources and data was as presented in Table 5.

Table 5: Access to Adequate Teaching and Learning Resources

Response	Frequency	Percentage
Agreed	62	36.91
Neutral	28	16.66
Disagreed	78	46.43
Total	168	100.0

The findings in Table 5 show that majority of the respondents, 78 (46.43%) in the category of disagreed said they lacked access to adequate teaching and learning resources while 62(36.91%) in the category of agreed indicated they have access to adequate teaching and learning resources while 28 (16.66%) were neutral. This indicates that most teachers lack access to adequate teaching and learning resources as indicated by majority of the respondents. This is in agreement with Ogbondah (2010) who observed that schools lack adequate instructional materials which impacts negatively on teaching and learning especially that to do with use of instruction time by teachers.

Teacher Training and Programmed Instruction Time Use

The respondents were asked to indicate whether teachers are trained on classroom time use. The results are as presented in Table 6.

Table 6: Teacher Training on Instruction Time Use

Response	Frequency	Percentage
Agreed	19	11.31
Neutral	23	13.69
Disagreed	126	75.0
Total	168	100

Data presented in Table 6 shows that majority of the respondents, 126 (75%) in the category of agreed indicated that teachers receive proper training on instructional time use while 19 (11.31%) said that teachers do not receive adequate training on classroom time use while 45 (25.67%) were neutral. The indication of this finding is that teachers are well trained on classroom time use and as such do not face pedagogical challenges in managing it. On the other hand, those who said teachers are not well trained are likely be those who were employed by the Schools' Boards of Management (BOM), some of whom may not have gone through teacher training institutions.

Teacher Absenteeism in Public Secondary Schools

According to Corey (2012), teacher absenteeism significantly affects the amount of time students are exposed to instruction. Based on this assertion, the study sought views on whether teacher absenteeism is common in public secondary schools. Data was as presented in Table 7.

Table 7: Teacher Absenteeism in Public Secondary Schools

Response	Frequency	Percentage
Agreed	108	61.36
Neutral	45	25.67
Disagreed	23	13.07
Total	176	100

Data obtained and presented in Table 7 shows that 108 (61.36%) respondents in the category of agreed said that there are days when teachers are absent from school, 23 (13.07%) disagreed that teacher are never or rarely absent from school, while 45 (25.67%) were neutral. From these findings, teacher absenteeism is common in public secondary schools as indicated by majority of the respondents and this concurs with findings by Abadzi (2007) who argues that teacher absenteeism has a major wastage of instruction time in schools.

Hypothesis Testing

The null hypothesis stated as follows, “There is no significant influence of teacher related factors on use of programmed instruction time”. This hypothesis assumed that teacher related factors and programmed instruction time use are independent. The Wilcoxon Signed Rank Sum Test was used to prove the validity of this claim. The dependent variable was use of time while the independent variables were teacher related factors influencing use of time. The p and z values of the test were presented in Table 8.

Table 8: Wilcoxon Signed Rank Sum Test Results for Teacher Related Factors Influencing Programmed Instruction Time

Teacher Related Factors	Z values	P values
Teachers’ attitude towards work	3.970	0.0001
Teacher motivation towards work	5.688	0.0000
Teaching and learning resources	7.117	0.0000
Teacher absenteeism	10.583	0.0000
Teacher remuneration	10.297	0.0000
Teacher training	1.754	0.0795

The results in Table 8 indicate that the P values of teachers’ attitude towards teaching, teacher motivation, and access to teaching and learning resources, and teacher absenteeism were all below the significant level ($P < 0.05$). The study thus concludes that these variables significantly influence programmed time use, and thus the null hypothesis was rejected; except for teacher training that had no significant influence on programmed time use ($P > 0.05$).

Conclusion and Recommendations

Based on the findings, the study established that, although teachers are well trained, they are not motivated to teach because they are poorly paid. The study further established that teachers lack access to adequate teaching and learning resources, and that teacher absenteeism is common in schools. The study thus concludes that various teacher related factors influence use of programmed instruction time. They include low teacher motivation, teacher absenteeism, lack of access to adequate teaching and learning resources and low remuneration.

The study therefore recommends better teacher remuneration by the government to boost their motivation. There is also need for cost sharing initiative between parents and the schools to be undertaken as a way of equipping schools with teaching and learning resources. Finally, the study recommends that school administrators should introduce and fully reinforce class attendance by teachers as a way of curbing the problem of teacher absenteeism.

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