



Tutors Performance Appraisal Strategies on Trainees' Academic Performance in Mathematical Engineering in Technical Training Institutions Nandi County, Kenya

BY

Celestine Wanyonyi¹, Kimotho Michael², Kimotho Michael², Atoni Rose³,

¹Master's Student (Catholic University of Eastern Africa)

²Lecturer (Catholic University of Eastern Africa)

³Senior Lecturer (Catholic University of Eastern Africa)



Article History

Received: 01/06/2024

Accepted: 05/06/2024

Published: 07/06/2024

Vol – 3 Issue –6

PP: - 18-22

Abstract

The purpose of the study was to evaluate the influence of tutor's professional knowledge on trainees' academic performance in mathematical engineering. The study was anchored on Goal Setting Theory. Quantitative paradigm was used, applying correlational research design. The study targeted 4 technical training institutions, tutors, heads of departments, Examinations officers, members of academic committee, and Chief Principals. Purposive sampling was employed to choose department heads, chief principals, and officials in charge of exams while simple random sample was utilized to choose technical training facilities, tutors, and members of the academic committee. Questionnaires, document analysis, and interview schedules served as research instruments. Validity was achieved through expert judgment and reliability by test-retest technique. Descriptive and inferential statistics (means, percentages, and multiple regression) and thematic analysis were used to analyze data.

Keywords: Tutors' Performance Appraisal Strategies, Mathematical Engineering

Introduction

Performance appraisals are administrative tools used to assess workers' work in light of predetermined standards and organizational objectives (Ademola, 2017). Performance appraisal practice exist in many sectors managed by human resource and contributed to employee motivation, retention, promotion of professional development, and ultimate growth of the organization.

In Europe, performance appraisal adopts an open discussion between the manager and the employee with the aim of improving communication and acceptance of feedback. achievement of organizational goals. Performance appraisal (PA) techniques are utilized in Singapore, Malaysia, and the US to evaluate an organization's performance in the education sector as well as other areas. In countries like Hong Kong performance appraisal is used to reward employees (Blasé and Blasé, 2016). While performance appraisal strategies are applied in these countries globally the strategies have produced different results. In Thailand use of performance appraisal was found as the major demotivating factor for staff in achieving set targets (Ingchatcharoen, Tangdhanakanond and Pasiphol, 2016). In Pakistan Performance appraisal strategy was reported to have failed in the public sector due to employees' poor attitude towards it (Aslam, Khan, and Ullah, 2017).

There has been a rapid adoption of performance appraisal strategies in the South, middle-level income countries. Most of the public sector in these countries have designed different metrics to measure the performance of their employees. While performance appraisal is majorly meant to provide feedback and identify training needs to improve staff output some countries use it for other purposes. In South Africa, performance appraisal is used to give feedback on inadequate performance, identify training needs, and recognize outstanding performance for reward (Swaartbooi, 2016). Mchunu, (2016), further observed that the government had given limited attention in performance appraisal of TVET institutions. This lack of attention on appraisal of academic staff had caused reduction on the quality of training affecting pass mark that dropped by 60%.

In Nigeria, Onyije (2016), established that performance appraisal system had a significant correlation with output for non-academic and academic staff. In Ghana, performance appraisal strategies were used in the universities to promote teamwork, identify workers' strengths and weakness and training needs (Kwaku, 2015). Kwaku (2015), however, asserted that appraisal strategy varied by institutions and most lacked efficiency since they were conducted by head of sections rather than line managers who were in touch with the staff.

Countries like Tanzania and Ethiopia adopted most of the Kenyans performance appraisal strategies which they use to determine employees training needs (Molleel, 2017). Uganda however, despite adopting a robust performance appraisal practice has failed to effect it objectively due to rigid and hierarchical administrative culture. Despite different country-based result performance appraisal strategies remain an important management tool for enhancing

employees' growth. Reward system and ultimately triggers achievement of any organizations (Armstrong, 2009; Nyongesa, 2018). Lindquist (2015), posit that an effective performance appraisal should be systematic and produce fair outcome.

Academic performance is reflected on academic achievement of the trainees which is measured by tests scores and grades attained in different training areas. This study focusses on academic score of TTI trainees in Mathematical Engineering which is affected by different factors among them trainees' attitude towards the subject, tutors' instructional approach, and availability of infrastructure. Fikile (2022) investigated the causes of TVET students' substandard academic

performance in mathematics. Lack of adequate professional development among lectures and lack of standardized admission criteria were major factors. Ugoani (2020), also found that employee's performance in TVET organizations was low due to inefficient performance appraisal strategy.

Methodology

Correlational research design were used and random and purposive sampling techniques were used. Data collection tools included a structured questionnaire, a detailed interview guide, and a document checklist.

Findings

One of the appraisal strategies was Professional knowledge and it was assessed in terms of tutor's ability to maintain professional records, syllabus coverage, and the outcome of the class attendances. Table 1 displays the tutors' replies when asked to assess the degree to which their schools implemented different tutoring tactics based on their professional expertise. The researcher used five-point rating scale as follows: 1- Very low extent; 2 -Low extent; 3 – Moderate extent; 4 – Large Extent; and 5 - Very large extent.

Table 1 Frequency distribution on tutor's professional knowledge influence onacademic performance of trainees

Aspects of Professional Knowledge		1	2	3	4	5
Preparation of course outline	F	1	5	9	18	7
	%	2.5	12.5	22.5	45	17.5
Prepare schemes of work	F	1	4	10	17	8
	%	2.5	10	25	42.5	20
Teaching using updated notes	F	4	6	8	11	11
	%	10	15	20	27.5	27.5
Maintaining records of work	F	0	3	8	11	18
	%	0	7.5	20	27.5	45
Availability of teaching aids	F	0	2	30	7	1
	%	0	5	75	17.5	2.5
Tutors' involvement in trainees' assessment	F	3	4	6	22	5
	%	7.5	10	15	55	12.5
Successful coverage of the syllabus	F	0	4	17	19	0
	%	0	10	42.5	47.5	0
Recovery of missed lessons	F	0	17	15	7	1
	%	0	42.5	37.5	17.5	2.5
Ensuring trainees class attendance	F	2	6	7	11	14
	%	5	15	17.5	27.5	35
Tutors class attendance	F	0	3	7	17	13
	%	0	7.5	17.5	42.5	32.5

When asked to rate how much they prepared the course outline, the tutors responded in the following ways: 18 (45%)

made a large contribution, 9 (22.5%) made a moderate contribution, 7

(17.5%) made a very large contribution, 5 (12.5%) made a low contribution and 1 (2.5%) made a very low contribution. This shows that Tutors preparation of course outlines was a common practice. Results from the interviews by HoD and examinations officers also agreed that Tutors prepared course outline for the subjects they are to teach. A statement from the Hod stated that

“These outlines are shared to the students in soft or hard copies. We have ensured that no one teaches without the course outline. The tutors also submit the course outline to the department with examinations before they start teaching.”

This statement indicate that preparation of the course outline was important it informed the students what the tutors expected of them for the course being handled, and provided a proper timeline of these expectations.

One of the examination officers said;

“For course outline it is mandatory to get it from the syllabus to enable lesson plan preparations before the lessons start. Copies of lesson plans are given to the Heads of Department and also to the trainees at the beginning of the Lesson. I have copies of all my course outlines in the course units that I teach How is this qualitative information explaining quantitative information as far as your design is concerned.”

This statement emphasized the importance of course outline and how Heads of Department ensure all tutors adhere to the professional requirement. According to Harmer (2007), in most educational environments, a series of courses that follow a "jungle path" approach would give the impression to the pupils that the instructor is incompetent or even negligent. The percentage of tutor preparedness requires that they prepare a course outline that give learning expectation and reading materials for the trainees to use for preparation to learn.

On the level of preparation of schemes of work, 17(42.5%) of the tutors prepared them to a large extent, 10(25%) indicated moderate extent, 8(20%) showed very large extent, 4(10%) showed low extent while 1(2.5%) showed very low extent. Majority of tutors prepared schemes of work for their course; this implied that the tutors had an insight to identify course content, methods, and relevant instructional materials which they use in the lesson, thus giving them enough time to sort out the requirements. Findings by Musingafi et al., (2015), highlighted that scheme of work was an effective teaching tool that ensured efficiency and effectiveness in teaching. Byusa, Kampire & Mwesigye (2020), finding showed that schemes of work did not improve learning efficiency of competency-based programs. These results implies that while schemes of work is key in teaching pedagogy it does not warrant effective delivery of teaching for improved academic performance.

Regarding teaching using updated notes, 11(27.5%) of the tutors updated the notes to a very large extent, 11(27.5%) of the tutors updated the notes to a large extent, 8(20%) revealed moderate extent, 6(15%) revealed low extent while 4(10%) revealed very low extent. The findings demonstrated most

tutors updated their lesson notes and used them during their lessons. Lesson notes do guide the tutors to the important and relevant points of the lesson, hence making them maintain order and enable the students to follow the lesson easily. Qualitative findings arising from the interviews with chief principals, departments heads and examination officers had slightly different view as chief principals and Head of Departments noted that tutors rarely updated their notes. A principal explained by stating;

“Tutors have changed these days. Many are not keen to read and improve their teaching notes. They use the same notes year in and year out. We also have some who do not have notes but use downloaded materials which they issue students as handouts.”

Another respondent a Head of Department said;

Some few tutors went to class with textbooks instead of lesson notes; we do hold one-on-one discussions with them and assist them adopt good lesson preparation techniques. Unprepared tutors are commonly disorganized and uncertain in their lesson delivery. They also waste a lot of time for the students by not having proper dimension to take during the lesson. Is this qualifying any quantitative findings on tutors who do not have lesson notes?

Tutors who do not update their notes to fit the current syllabus affect the trainees because they keep consuming knowledge that is half or less of what is required of them. This has direct impact in the poor performance of mathematical engineering because the mode of examination given out is standard by Kenya National Examination Council (KNEC) which keeps updating their examination coverage. For better performance, tutors need to update their note and ensure it captures contemporary issues. The assessment system used of any system must be fully aligned with the content standards (Jaeger & Tucker, 2001).

When asked to assess the extent to which the tutor maintained work records, 18(45%) of the tutors indicated that they maintained them to very large extent, 11(27.5%) indicated large extent, 8(20%) indicated moderate extent and 3(7.5%) indicated low extent. The tutors demonstrated that there was proper level of maintenance of records of work for the lessons they covered. By assisting tutors in determining each student's unique requirements and customizing education to meet those needs, the work records provided valuable information for instructional planning. This could help to ensure that all the students were receiving instruction that is appropriate. These findings were supported by (Ronfeldt et al., 2015), who contented those records of work was key in effective learning and enhancing academic performance among learners.

Regarding the level of availability of teaching aids, 30(75%) indicated that they were available to moderate extent, 7(17.5%) showed a large extent, 2(5%) showed to a low extent while 1(2.5%) showed to a very large extent. This showed that teaching aids were available but not adequate for use in some of the TTI's. Some teaching aids were quite expensive and would not be easily acquired by the institutes. One chief principal said:

Learning/teaching aids are an integral component in any classroom. They help learners in illustrating or reinforcing a skill or concept, differentiating instruction, and relieving anxiety and boredom by presenting information in a new and exciting way. However, some teaching aids, particularly for sciences, are a bit expensive and may not be consistently provided by the technical institution.

Some of the teaching aids are expensive to buy and the ones available are also expensive to maintain. This makes the materials available but with high maintenance costs making some of them not to be functional. This contradicts the assertion made by UNESCO (2008) that an object that is handled skillfully leaves a more lasting impression on the mind than one that is only observed from a distance. This affects the lesson delivery of the knowledge with some practical lessons not being delivered as required thus contributing to poor performance in Mathematical engineering.

On tutors' involvement in trainees' assessment, 22(55%) of the tutors indicated that they were involved to a large extent, 6(15%) indicated to a moderate extent, 5(12.5%) indicated to a very large extent, 4(10%) indicated to a low extent while 3(7.5%) indicated to a very low extent. This shows that tutors were involved in trainees' assessment. Department directors clarified that the purpose of tutors in student assessments was to establish developmental criteria, which represented a learning trajectory associated with certain objectives and applicable to various pertinent tasks. The tutors designed and administered continuous assessment tests and participated in invigilation of final examinations. One of the tutors said:

Continuous Assessment Tests are administered in different ways, as a sitting CAT, as take away, or assessment as a group discussion after being given a project. CATs are given on a standard of at least two per unit in a semester, after which the main examination is administered from Kenya National Examination Council. Grading is done in percentages with the maximum being 100% in all the sectors assessed in a unit

This indicated that the trainees are well assessed in accordance to the government policy of the KNEC examination administered in TTIs.

Regarding successful coverage of the syllabus, 19(47.5%) tutors indicated that it was done to a large extent, 17(42.5%) indicated to a moderate extent while 4(10%) indicated to a low extent. This implies that tutors successfully covered the syllabus on time. The response from interview with Head of Departments, examinations officers, and Chief Principal shared different opinion. In a statement one Head of Department shared the following;

"Syllabus coverage is a daunting exercise as many are not able to exhaustively complete the syllabus for mathematical engineering due to the wide scope. Often tutors hide behind giving group works on same subject areas which should not be the case."

An examinations officer stated that;

"I do not think the tutors finish the syllabus by the time of the examinations. We have observed trainees struggling to answer some questions and when asked they would indicate that some of the areas were not taught".

This comment indicates that although the tutors said they covered the syllabus to a large extent this is not done and could be a contributing factor to poor academic performance in mathematical engineering. This finding agrees with observation by (Tiluan, 2020), who noted that effective delivery of lessons is affected by wide scope in subject areas with limited support on innovative ways of coverage of the syllabus.

Tutors were asked to rate the extent to which they recovered missed lessons, 17(42.5%) of the tutors did it to a low extent, 15(37.5%) did to a moderate extent, 7(17.5%) did to a large extent and 1(2.5%) did to a very large extent. The findings showed that the extent of recovery of missed lessons was low. This implies that most lessons are taught and there is low level of missed classes.

Head of Departments mentioned that missed classes are rare but when it happens mostly it is due to sicknesses or tutors' attendance to training. The Head of Departments noted that limited number of staff also cause poor recovery of missed lessons. One of the Head of Departments explained that;

There are sometime when trainees miss their lesson in Mathematical engineering. The recovery of these lessons is challenged by absenteeism due to sickness or other related factors, tutors work trainings that take up class time, and also tutors being given a lot of administrative responsibilities that are overwhelming. Some of the responsibilities are due to inadequate staff needed to be working in those particular areas"

Missing an important lesson that is foundational to success of students in a given class may derail academic performance in a course. Therefore, learning how to deal with and recover from school absences is an important life skill that can save tutors from poor performance in mathematical engineering in technical institutions. As per Dryfors (2002), educators serve as behavioral role models for their pupils, and a high number of absences is interpreted as a sign of a lack of ethical and professional integrity. Because when the role model fails to show up in the class, students tend to lose direction, motivation, and sense of security or self-control and that is a direct effect in poor performance in mathematical engineering.

The tutors were requested to rate the extent to which they ensured trainees' class attendance; 14(35%) of the tutors indicated that they ensured this to a very large extent, 11(27.5%) did it to a large extent, 7(17.5%) did to a moderate extent, 6(15%) did to a low extent and 2(5%) did to a very low extent. Results showed that majority (57.5%) of the tutors ensured that the trainees attended their classes. The results indicate there was high rate of tutors ensuring trainees attend classes. This was supported by the Head of Departments and

examinations officers.

According to one of the Ho Head of Department, "Class attendance is a common practice since the engineering classes do not have many trainees. The tutors ensure they mark the class attendance in every class and the same register is submitted to the department for follow-up purposes. Students who do not meet 75% of class attendance are not allowed to do examinations."

The examinations officers had different opinion on class attendance. A statement by one examinations officer noted that;

"It is true that tutors ensure class attendance by the trainees. However, these trainees being adults it is hard to force them. Some will miss classes and come during the exams. We have observed a few cases who are removed from the exams due to lack of meeting the 75% class attendance threshold. Class attendance for such a unit is key because the unit is involving and trainees cannot perform well on self-learning only. They need to interact with tutors in most of the areas."

These results imply that tutors encourage trainees class attendance and low attendance of class affect academic performance in mathematical engineering.

On managing their own class attendance, 17(42.5%) of the tutors said that they managed to a large extent, 13(32.5%) indicated very large extent, 7(17.5%) indicated moderate extent while 3(7.5%) managed their class attendance to a low extent. Qualitative findings from the interviews revealed that trainees' and tutors' class attendance at teaching and learning events is strongly linked to academic success of the students. It is the primary indicator of a student's engagement levels with their tutors and with their course of study. It could also serve as a first-level indicator for learner's retention, well-being, or academic progression.

Conclusions

The research concluded that: Tutors' performance appraisal has a significant relationship with trainees' academic performance in mathematical engineering. Professional development, promotion of co-curriculum activities, adherence to administrative duties and protection, safety, and discipline influenced trainees' academic performance. There is need for the ministry to employ more tutors and female tutors in STE subjects to make the subjects attractive and improve learners' attitude towards the subjects.

Tutors usage of digital content and ICT in TTs was low leading to poor academic performance in mathematical engineering. When performance appraisal strategies are not fair and inclusive, they may cause non-commitment among tutors and the ownership of the targets; this affects the performance of the technical training institutions in Mathematical Engineering. The research established that performance appraisal strategies were highly adhered to and were therefore opening up opportunities to tap the potential of the appraisal system so as to support knowledge management

and system-wide learning. Therefore, there is need to bring together the educational goals or targets so to facilitate the provision of a broader vision and strategies for the educational systems

Recommendations

The research suggested the following recommendations in light of its findings:

To improve professional development among tutors the TVET should ensure that tutors are assessed on their skills on an annual basis. This will ensure that trainers are upgrading their skills to match the industry needs and use innovative and friendly methods in teaching mathematical engineering unit. Tutors should normalize utilization of digital content and ICT to improve delivery of lessons in Mathematical engineering to address the problem of poor performance. TTs institution should invest more in ensuring tutors have the required teaching aids to improve understanding in Mathematical engineering.

The TTIs, the Ministry of Education, and the Ministry of sports should work harder to increase trainees' focus on their abilities and participation in extracurricular activities. TTI institution should allocate budget to support trainees who show interest to co-curriculum activities.

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