Journal of African Interdisciplinary Studies (JAIS): **ISSN 2523-6725** (online)
August 2022 Vol. 6, No. 8

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The Influence of Instructional Methods on Student Skills Development in Public Technical Training Institutions in Kenya

By

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Abstract

Technical education skills development is one among other strategies thought to be what Kenya needs for the achievement of vision 2030 (Ministry of Education [MoE], 2019). To realize this vision, Kenya needs a critical mass of well-trained graduates. In regard to this, a serious discrepancy between skills produce by training institutions and skills required by industries has been raised. Luas, et al (2012) asserts that when such a phenomenon is raised the problem in mainly in pedagogy. The study thus sought to address this by establishing the relationship between instructional methods and skills development. Results indicated that; (H_O) there is a statistically significant relationship between instructional methods and skills development. Qualitative results supported these findings as data revealed that TTI pedagogy was highly theoretical. The study proposed a perceptual curriculum implementation model suitable for tackling instructional issues facing TTIs.

Key words: Kenya, Instructional methods, Skills development, Technical institutions, Industry

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Introduction

Simpson's (1966) defines technical education instructional methods as strategies used in transmitting skills and knowledge based on Benjamin Bloom's Taxonomy objectives of education categorized as cognitive, psychomotor and normative. Simpson's 1966 study seem to be inspired by Tyler's 1940 rationale and Benjamin Bloom's 1956 taxonomy as explained by Chandio, Pandiani and Iqbal in 2017. Tyler's rationale analyzed from the technical education perspective requires curriculum planners to answer the following four questions before the its implementation: What is training purposes should technical education seek to obtain? What instructional experiences can be put in place in order to achieve the purposes? How can these training experiences be efficiently arranged? How can we determine whether these purposes are being attained? Focusing on the second question, instructional methods in the process of skills development in inevitable. In regard to this, Simpson (1966) asserts that an effective technical education training should apply instructional methods based on cognitive, psychomotor, and normative domains. Conversely, lecturer method seems to be preferred as the most idea method in skills development by developing nations, grievances of employers of inadequate trained skills notwithstanding (Anindo, 2016). These context thus forms a basis for empirical investigations on the influence of instructional methods on skills development in public technical training institutions in Kenya.

Background to the Study

The escalating unavailability of quality skills globally has challenged governments to review education systems in order to meet the required global standards. In regard to skills development, the United Nations Education Science and Cultural Organization [UNESCO], 2015) and the World Bank (2020) observed that the world is utilizing skills that are not adequately taught and if they were, they lacked certification. Moreover, a low opinion in regard to technical education by the common man globally continues to trivialize technical education pedagogy (Eicker, Haseloff, &Lennartz, 2017). As a result, the profession of a technical education lecturer seems to be undermined globally. In so doing, the world seems to be oblivious of the fortunes embodied in this form of education. Nevertheless, serious and significant effort towards review and investment in technical education lack in most developing counties as most of them allocate one percent of annual budget to technical education (Eicker, et al, 2017). Despite the observation, United States of America (USA) leads in technical skills instruction with well-organized secondary schools that apply the dual form of instruction in which theory and practical learning are offered simultaneously (Dortch, 2014). European Union applies the same system as USA but at tertiary level of learning. Most developed Asian nations among them, Malaysia and Korea have adopted the European Union approach in teaching technical skills [OECD], 2011). Meanwhile these nations advanced in technical education instruction, most nations were recuperating from colonial experiences in which the natives were trained in technical skills purposely to serve their masters. Despite this, various ministries of education are aware of this challenge and thus in

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the process of reviewing education systems with the goal of addressing issues of skills gap. Despite the concerted efforts made by the government of Kenya to improve to skills development by raising the standard of technical education teacher training, the difference between technical institutional skills and those of these required by industry has persisted.

Statement of the Problem

Technical education is a major element in the economic and social growth of any nation globally. On this regard, Kenya envisions technical education as one strategies in the achievement of vision 2030 and as an enabler of development. Despite this, employers have raised concerns in regard to disparities between skills produced by TTIs and these required by industries. Despite the efforts the government had made in addressing the issues of skills gap such as raising standard of training skill lecturers the issue of skills gap has persisted manifesting in the presence of incapacitated lecturers skipping challenging topics (TVETA, 2018), inability to cover coursework, lack of skills lectures especially, in subjects that require science and Mathematics, presence graduates with impressive academic credentials but lack employable skills (Anindo et al, 2016; Wambui, 2016). In this regard a difference between skills taught in training institutes and those required in the industries is observed. Due to this mismatch Kenya has suffered consequences of inadequately developed skills evidenced in physical structures collapsing and taking lives across the country notwithstanding the import of second hand textile products (Maina, Kahando & Maina, 2016; Njoroge, 2019). When such a phenomenon is observed (Lucas, Spencer and Claxton, (2012) assert that the main problem is in teaching of skills the classrooms, workshops and laboratories of the training institutions. Therefore, the urgent need to fill the gap through an investigation on the influence of instructional methods on student skills development initiated this research.

Research Objective

To establish the influence of instructional methods on student skills development in public technical institutions in Kenya. to achieve the objective, the study used the following questions: Which instructional methods are most applicable in this TTI? How well are lecturers prepared to teach subjects allocated? Which factors influence the choice of instructional methods that you use? To what extent instructional methods influence skills development?

Research Hypothesis

The study hypothesis was tested on its null form:

H_0*: there is no statistical relationship between instructional methods and student skills development in public technical training institutions in Kenya*

Purpose of the Study

The purpose of the **s**tudy was to investigate the influence of instructional methods on student skills development in public Technical Training Institutions in Kenya in order to provide evidence based findings and solutions to the instructional equipment issues in Kenya.

Methodology

The study was anchored a Convergent Parallel Mixed Method Designs which requires collection of quantitative and qualitative data concurrently, analyzed independently, results compared and contrasted and conclusion made. Target population included principals,

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lecturers and students of public TTIs in Kenya. Fisher (1998) & Barttllet et al (2001) formula were used in sample determination which yielded a sample of 11 principals, 100 lecturers and 100 students. Contacted population included 8 principals, 80 lecturers and 80 students. Simple random sampling was used in sample selection at the actual study for lecturers and students and purposive for principals. Questionnaires were used in collecting data from lecturers and students while interview schedule was used on principals. Cronbach alpha was used to test reliability of the research instruments as they yielded a Cronbach Alpha of 0.81 highest and 0.70 lowest for items related to the dependent variable. Tested items focused on technical skills, students' academic quantitative and communication skill levels in which the study sought to understand how well TTI students were prepared for leadership and management roles for industries and other forms of employment.

Ethical Considerations

Research is about truth. On this basis, research principles call upon all researchers to maintain morals, norms and standards required (Resnik, 2015). It is on this basis that the researcher sought to obtain a research introductory letter from the Kenya Methodist University through the office of the Dean, Postgraduate and Social Science Studies, a national research permit by the National Council for Science Technology and Innovations (NACOSTI) and a research authorization letter by the Technical Vocational Education and Training Authority (TVETA) who authorized all sampled TTIs to allow me collect data. During data collection period, Covid 19 protocol by the Ministry of Health was observed, participant consent was obtained, confidentiality and anonymity was observed and all sources of information used were duly cited.

Data Analysis

Data was analyzed using a convergence parallel mixed methods approach in which quantitative and qualitative data were collected concurrently, analyzed separately, compared and contrasted and interpreted. The Chi square test was used in testing hypothesis.

Theoretical Framework

The study was anchored to the Open systems theory in education by Ludwig Von Bertananfy (Adams et al, 2014) and the Decision Making theory by Simon Herbert (Campitelli & Gobet 2010). The former theory was selected due to its social principle of unity of purpose in addressing teaching and learning issues while the later and was selected due to its scientific characteristics of satisficing and bounded rationality principles necessary for addressing educational issues. An open system is a complex of interacting elements that are open to, interact with their environments in order to achieve set goals. A public TTI is a system comprising of students, principals, lecturers as main elements and inputs, through puts and outputs and sub elements. Instructional methods are through-puts in this case. The two theories were important to this study as they involve the leaner and the lecturer hence providing a basis for understanding inherent instructional method challenges in the training institutions. Moreover, the theories provide a basis for adequate evaluation of results, decision and recommendation making.

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Review of related Literature on the Influence of Instructional Methods on Student Skills Development

Simpson's (1966) defines technical education instructional methods as strategies used in transmitting skills and knowledge based on Bloom's Taxonomy objectives of education categorized as cognitive, psychomotor and normative. This definition shows that technical education requires multiple methods of instruction in the process of skills development. In regard to instructional strategies, UNESCO-UNEVOC, (2015) envisions technical education curriculum as psychomotor domain in which demonstration method is the main instructional method. For the purpose of addressing issues of skills gap, Cedefop (2015a) advises that every technical education lecturer needs to understand different types of instructional methods and various types of theories of learning for effective teaching of leaners with diverse learning needs. For this concern, a TTI lecturer needs to be well trained in pedagogical sciences in which learning theories such as cognitive, behavioral, constructivism, and social theories are emphasized.

In this regard, a study conducted by McCrone et al. (2015) in the United Kingdom (UK) sought to understand how principals, students and lecturers understood teaching and learning of technical education at tertiary levels and how skills assessed was carried out. Using a qualitative approach of phenomenological design, the study established that effective skills learning was a systemic process achieved by different elements in the system performing their duties as one. Findings showed that effective instructional method depended on the type of curriculum designed, teacher knowledge and understanding of the curriculum, learning environment, curriculum objectives, teacher traits and teacher role distribution. The study opined that an effective teacher in technical education requires four types of knowledge for effective teaching. These included: coursework, instructional, technological and contextual knowledge. Additionally, the study asserted that effective teaching requires a teacher to reflect upon personal qualities such as interpersonal relation abilities with professional knowledge acquired.

At the same time, the study opined that cognitive knowledge is important in technical education and therefore technical education students need to acquire the knowledge through research, extra practical work in the laboratories, workshops and individual part-time knowledge and skills search in relevant places. These recommendations are well stipulated in the Kenya Technical Education course syllabi by the Keya Institute of Education and despite the fact that much of the syllabi content is analogue, Anindo (2016) findings shows that one of the causes of skills gap in most nations struggling with inadequately trained skills is failure to implement policy. The weakness of this study is that the study failed to address instructional method for generic skills such as communication skills that are essential in skills development process.

Sarikaya and Yildirim (2019) sought to understand how technical education principals, lecturers and students understood teaching and learning at higher vocational schools in Turkey. Findings showed that all of them agreed that product-oriented process yielded greater outcomes in skills development as compared to process-oriented learning approach. The product-oriented learning process involved teacher roles in skills development such as developing lesson plans and preparation of instructional materials, teacher knowledge, curriculum design, instructional methods and arrangement of learning environment. Findings based on product-oriented learning process created an environment for learners to acquire job competencies, job knowledge, skills code of conduct, and job search abilities such as writing of internship and permanent job seeking letters. The Turkey skills

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learning approach support the common saying of "the end justifies the means". This approach of skills learning advocates to balanced learning as (Chandio et al., 2017) explained that both process and product learning orientations are important in skills learning and effective when monitored and supervised.

According to sessional paper number one of 2005, effective knowledge and skills acquisition requires media support. Saefudin and Sumardi's (2019) research underpins this statement my asserting that media is an important tool in the process of teaching a technical subject. This involves an enhancement and understanding of skills imparted through simulation and promoting teacher-student active participation in learning. The question whether nations whose annual budgetary allocations is 1% for technical education could be able to do this requires another study.

A study carried out by Ahmed, Nordin, Ali, Nabil, and Latip, (2015) in Malaysia sought to identify technical education student preferences on conducting automotive courses teaching and learning sessions in a workshop in Malaysia. The study findings revealed that the students had peculiar characteristics that needed to be considered when selecting teaching methods. In most cases, the learners were observed to be visual oriented. They preferred earning from what they see like pictures, video demonstrations and films. The study also found out that students preferred demonstration, sketching and question techniques at the introduction. At the body level, the students preferred small group approach, module and problem-solving approaches. At the conclusion, the learners preferred re-explanation, question technique and report writing. While Roofe and Ferguson (2018) also established that interactive and practical methods of teaching were preferred and yielded quality skills, it is unfortunate that this is not the case in public TTIs in Kenya as established by (Anindo, 2016); (TVETA, 2019). The researchers made an observation that a lecture method of instruction is used in teaching a psychomotor domain based subject due to overcrowded classrooms and lack of sufficient training equipment. A related observation made by Malechwanzi (2018) in Kenya, shows that absent mindedness of students in class as an aspect that affects learning processes. A similar observation was made by Burdenhost and Radile (2018) in South Africa. One weakness to these studies is that they failed to show how they measured absent mindedness of the students. To fill this gap, another study is required.

Studies conducted in Tanzania and in the Philippines by Munishi (2016), and Brewer and Comyn (2015) respectively shows that developing countries suffer inferiority complex when presenting technical skills at international level. Oyebolu and Lemu (2013) opines that such problems can be tackled using an integration of Information Communication Technology (ICT) into the traditional technical education instructional methods. This strategy is described as having multiple advantages over the traditional instructional methods because it enables easy inclusion of emerging issues into the curriculum, create a forum for TVET teachers to update a given coursework of a global concern, unites students on the same class with those of other training institutions globally in conducting study experiments and finding ways of tackling study problems and thus enable a radical acquisition of diverse technical skills available in different parts of the world. Oyebolu and Lemu's (2013) study alludes to the fact that instructional methods in isolation of ICT in the highly developing and evolving technological world may not facilitate effective development of well skilled graduates. To address these issues, another study that focuses on ICT and skills instruction will be required.

A study conducted by Muthoni (2015) on the influence of pedagogical techniques on student performance in Mechanics in selected technical institutes in Kenya sought to compare

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performance in Mechanics when taught using steeplechase activities and when taught using traditional methods with an aim of contributing to knowledge on modeling mechanics problems. The study diagnosed several problems in mechanics instruction such as lack of basic manipulation facts that included inability to calculate initial velocity, use of square roots, errors related to calculations in linear motion, inability to convert speed from kilometers per hour to meters per second, lack of basic arithmetic abilities to addition, subtraction, multiplication and division facts, inability to plot velocity graphs, find area of velocity time graph when computing distance and inability to interpret graphs or even find area of trapezium among others. Inability to solve simple mathematical problems is a sign of skills gap as technical education is about mathematics and sciences. The experiment showed that the application of the steeplechase method in teaching mathematics yielded positive results showing that causes of skills gap in Kenya can be attributed to instructional methods selected. These findings agree with Anindo's (2016) findings in Kenya and Ahmed et al (2015) in Malaysia.

Technical education is not only offered at TTIs but also in universities at Craft and Diploma levels of learning (Mwangi, 2015). Mwangi's (2015) study at Kirinyanga University College showed that lecturers and instructors are quite knowledgeable in skills development. The pedagogical strategies involved use of demonstration and discussion methods in teaching practical subjects. These methods enabled effective interaction of students with the course content and thus instruction made easier in the assimilation and acquisition of skills and knowledge. These findings show that to solve instructional problems in TTIs universities need to be involved.

For this concern, the study advocates for use of demonstration method of instruction in a technical lesson as it utilizes several senses that enable students to hear and experience the actual event. This was deemed suitable for skills development as it enkindles learning interest, stimulates present ideas and concepts, provides direct experiences, reinforces learning and can be applied for both small and large groups of learning. This is unlike the lecture method that is effective in teaching communication, interpersonal, creative writing, problem solving skills and all other skills that make student better citizens (Ahmed et al., 2017). In the quest of addressing issues of skills gap, this study endeavored to understand how various instructional method are applied and how they can be integrated with the purpose of tackling issues of skills gap in Kenya.

The literature reviewed on instructional methods show that most developing countries globally prefer lecture method in teaching a psychomotor knowledge-based domain. This is due to lack of sufficient equipment which was revealed at an average ratio of 1:4, inadequately trained lecturers and use of obsolete and irrelevant equipment to those of the industries. These findings reveal a significant relationship between instructional methods and skills development. None of the studies reviewed addresses the problem of instructional method from Benjamin Bloom's Taxonomy point of view and neither from the theories of learning point of view. It was therefore important to examine how instructional methods influenced student skills development in Kenya.

Presentation and Discussion of Data Analyzed on the Influence of Instructional Methods on Student Skills Development

Quantitative data on the lecturers' responses: In any form of education instructional language is a prerequisite to instruction (Lucas et al, 2012). The study thus sought to find out if students had challenges in regard to English language which is the main instructional

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language for TTIs in Kenya. Lecturers were best placed to respond to this questions and the following results were obtained:

Table 1: Instructional method used in TTIs

Instructional method used in TTIs	Frequency	Percent
Lecture	59	28.78
Lecture and demonstration	32	15.61
Project work	28	13.66
Discussion	23	11.22
Experimentation	18	8.78
Field trip	16	7.80
Context based learning	11	5.37
Problem based learning	10	4.88
Simulation	6	2.93
None	1	0.49
Any other	1	0.49
Total responses	**205**	**100**

Source: Field Data 2022

Table 1 shows that demonstration method is preferred most in instruction with a score of 59(28.78%) followed by lecture and demonstration 32(15.61%), project work 28(13.66%), group discussion 23(11.22%) Experimentation 18(8.78%), Field trip 16 (7.80%), context base learning 11 (5.37%), problem-based learning 10 (4.88%) simulation 6(2.93%) respectively. The findings show that lecturer method is the most ideal method for instruction in TTIs hence showing that TTIs in Kenya are very theoretical. Similar findings were established by TVETA, (2018) in which lecturers were observed using lecturer method and skipping challenging topics in Kenya. The question as to why the method is preferred most in a psychomotor based domain mode of learning needs to be established. In this regard, Sessional paper number one of 2005 states that that effective knowledge and skills acquisition requires media support. Oyebolu and Lemu's (2013) observes media integration has not been successful in Nigeria.

Conversely, Saefudin and Sumardi (2019) opines that effective knowledge and skills acquisition in TTIs require media support as it is an important tool in the process of teaching a technical subject as it involves an enhancement and understanding of skills imparted through simulation and promoting teacher-student active participation in learning. Nevertheless, the responses show that the lecturers are aware of pedagogical strategies required in TTIs however most of them are traditional. The responses thus show that modern instructional methods are lacking in TTIs in Kenya and thus this could be another source of skills gap in Kenya. Skill lecturers are expected to be creative and innovative in all circumstances of instruction. However, different teaching environments may influence varied instructional behaviors. In regard to this Kryriz (2016) suggests that, un-training to retrain could be a solution to the instructional issues. Meanwhile this could be a solution, the question whether developing nation could offer such services arises.

The study thus sought to establish what influences choice of instructional methods used in the training institutions. The following results were obtained:

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Table 2: Factors that influence choice of instructional methods by lecturers

Factors	Frequency	Percent
Number of students per class	8	15.38
Availability of training equipment	14	26.92
Time allocation	12	23.08
Work load allocation	5	9.62
Student ability	9	17.31
No response	4	7.69

Source: Field data 2022

The results indicated that availability of training equipment 14 (26.92%) had the highest influence, number of students per class 8(15.38), time allocation 12 (23.08) and the least being teaching workload 5 (9.62). The results thus revealed how theoretical TTIs in Kenya hence a cause of skills gap in Kenya. Moreover, the findings show that issues in regard to pedagogy in TTIs are systemic in which some stakeholders are possibly not performing their roles as expected. The question whether the person responsible for lecturer recruitment for TTI is aware of such shortcoming arises. Similar findings were established (Anindo 2016) In this regard Anindo (2016) established lecturers had challenges with that instructional methods as student-equipment ratio was 1:4 and above hence students graduate without even touching the instructional equipment. In regard to instructional issues, Joo (2018) study asserts that the issues can be ended through effective supervision by a PhD holder and through Center Focused Development leadership skills. This study that proposes a PhD holder for TTI management could a solution to issues of skills gap in Kenya.

The lecturers were asked to show the extent to which the instructional methods influence skills development among students. The following results were obtained.

Table 3: Extent Instructional methods influence skills development

Extent instructional methods influence skills development	**Frequency**	**Percent**
Low	2	2.9
Moderate	18	26.1
High	38	55.1
Very high	11	15.9
Total	**69**	**100**

Source: Field data 2022

In regard to table 4, majority of the lectures 38 (55.1%) show that instructional methods influence skills development to a high extent. Only 2 (2.9%) of the lecturers said that there is a low influence of instructional methods and student skills development. 18 (26.1%) of the lecturers agreed that instructional methods have a low influence on skills. 11(15.9%) showed that instructional methods have a very high influence of student skills development. The respondents thus agreed that instructional methods influence skills development. similar findings were established by (Anindo, 2016; Chandio et al, 2017; Sarikaya & Yildririm, 2019). The findings thus show that Tyler's 1949 rationale in regard to the four questions

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among them: How can we determine whether these purposes are being attained is not seems not to be adhered to by the TTIs.

Qualitative data on the lecturers' responses

The lecturers were asked to explain why the choice of instructional method. Responses obtained were eschewed toward availability of instructional methods. In this regard, the lectures opined that inadequate of unavailability of instructional equipment and lack of manufacturer knowledge demands the use of lecture method. In regard to this, respondent number 7 method wrote that: *The equipment are available but we in a case where the machines are new and we do not have the manufacturer knowledge, the machine remains in the store.* Respondent number 17 opined that: *instructional methods are not necessary in skills instruction since the attention is on hands-on learning.* In regard to these findings, the question whether the sector responsible for TTI instructional equipment is aware of such problems arises. Moreover, these findings can be used to show that systems thinking in skills development in Kenya is lacking and collaboration between manufactures and lecturers is lacking.

Quantitative Data for Student Responses

To establish the effectiveness of instructional methods in the TTIs the study sought to find out if the students were satisfied by the way they were taught. The following results were obtained:

Table 4: Student satisfaction with instructional method used

Satisfied by lecturer teaching methods	Frequency	Percent
No	18	25.7
Yes	52	74.3
Total	**70**	**100%**

Source: Field data 2022

Table 4.5 shows that majority of the students 52(74.3%) were not satisfied by the way they were taught while 18 (25.7%) were satisfied. When majority 52 (74.3%) show that they are not satisfied by the way they are taught, the aspect of competence of their lectures in questionable. In 2018, similar findings were established by TVETA (2018) among TVET lectures in which lectures were observed skipping topics that they had challenges with. Inadequate trained lecturers is thus another cause of skills gap in Kenya.

To understand whether or not relevant instructional methods were applied or not, and how the methods influenced skills development, a Likert scale on lecturer competence and student satisfaction with the teaching was administered to students. The following results were obtained:

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Table 4.5:Lecturer competence in practical lessons and student satisfaction with learning

Chi-square test	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.866[a]	4	0.000
Likelihood Ratio	27.366	4	0.000
Linear-by-Linear Association	18.584	1	0.000
N of Valid Cases	70		

a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is 1.54.

Source: Field data 2022

A Chi-square test was performed to compare the relationship between lecturer competence and the students' satisfaction on how they were taught practical skills. The test shows that there is a significant relationship ($p<0.001$, Chi-square=25.866, df=4) between lecturer competence and student satisfaction with subject being taught. The results thus reveal that students seem to be non-committal to their instructors' competence. This depicts an ambivalent position that there are both competent and incompetent lecturers in TTIs in Kenya as descriptive statistics results also revealed. The reason for this observation can be related to the principals' responses in regard to lecturer competence that TTIs were once vocational training schools and upon upgrade of to TTIs, the instructors were automatically absorbed without retraining and proper orientation to TTI teaching. The observation can also be related to lack of effective instructional supervision and inadequate external stakeholder's role performance.

Qualitative data for student responses

The students were asked to explain why they were not satisfied by the way they were taught. Responses gathered showed that students were reserved by the way they evaluated their lecturers however the responses gathered mirrored on low professional competence as there seemed to be an agreement among students that TTIs hired both high and low competence lecturers. In regard to lecturer competence, majority opined that some lecturers were not able to teach course unit allocated. The student respondents also lamented that field trips and library sources lacked in their training. Issues of and indiscipline among lecturers were raised among them harassment and tribalism. The role of the deans of studies and students was thus a concern. Similar findings were established by Malechwanzi (2018) at the TTIs of the Coastal Region of Kenya in which lecturers were not committed to teaching and students lamented about unethical behavior among lecturers. When students raise such grievances in regard to education and training, person pointed out here are the principal, dean of studies and dean of students and their roles in ensuring that teaching is effectively done according to the code of conduct or chatters. Lack of all these show that conducive learning environment in TTIs in Kenya is not provided as a trickle-down effect of the misconduct among lecturers to students is likely.

Principals' Responses

The classical education experts recommend that every educator need to be well grounded in educational psychology. In regard to pedagogy, the principals were asked to explain how well the lecturers were prepared to teach subjects allocated. Responses gathered focused on lecturer competence in the perspective of McGregor' X and Y theory, student population and

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instructional materials and instructional equipment factors. In this regard, majority of the principals were in agreement that the lecturers are well prepared by their pedagogical colleges and universities however, there same lecturers were not well prepared to teach Competence Based Education Curriculum. The principals also revealed that despite the fact that the lecturers were trained by various universities and colleges there is a tendency of choosing not to apply pedagogical science knowledge learned.

Responses that differed included the following: **Interviewee 1:**

> We have both qualified and unqualified lectures. This is because the institute was once a vocational training school and when the institute was upgraded, all trainers were absorbed without proper training and orientation towards technical education. This thus is a challenge to the collective pedagogical efforts in this institution. In this regard, some lectures cannot express themselves in English but by the fact that they are able to teach practical lessons we move on with them.

The X and Y principles of Macgregor's theory opines that in a work place, an average person is likely to cheat. The theory further opined that human beings are lazy animals which dislike work and like money and not unless they are supervised no work will be done especially when the X category is considered. Who then can be held responsible of these undesirable findings? The vocational school teacher that was elevated to TTI teaching of the university graduate? A study will be required to establish the cause of this undesirable findings. Interviewee 5:

> TTI has high numbers of students therefore to match effective teaching with the number of students is a challenge. Student lecturer and student equipment ratios are incommensurable. In that case, lecturers are overwhelmed in the teaching and thus prefer lecturer method.

Similar findings were established by Roofe and Furgason (2018) in Jamaica and among the Caribbean countries, TVETA in 2019, and Mwangi (2015) in Kenya in which the lecturers were observed lacking capacity to align curriculum components that included objectives of TVET education and instructional methods. The findings agreed with global findings showing that adequate training and supervision of skills learning processes could be a solution to skills learning (Anindo, 2016; Baglow, 2016; Ifenyiwe & Serum, 2016; Joo, 2018; Kryriz, 2016; Osman& Kamis, 2018). In this regard Mosomi, Kindiki, and Boit (2014) established that Teacher Performance Appraisal Development System (TPADS) were only effective in library, inventory and teaching and learning material management but not to skills learning in classrooms workshops and laboratories.

Document analysis Findings

The analysis was based on syllabi, schemes of work, lesson plans and course outlines. the documents generated qualitative data only. The availability of such documents as required is an indicator of quality skills development. A study of the document showed that the documents were available in most TTIs but updated. Professional records are prerequisites to instructional in any institution of learning. Lack of professional documents as spelled in the curriculum show that there is a problem in regard to skills learning in Kenya as learning

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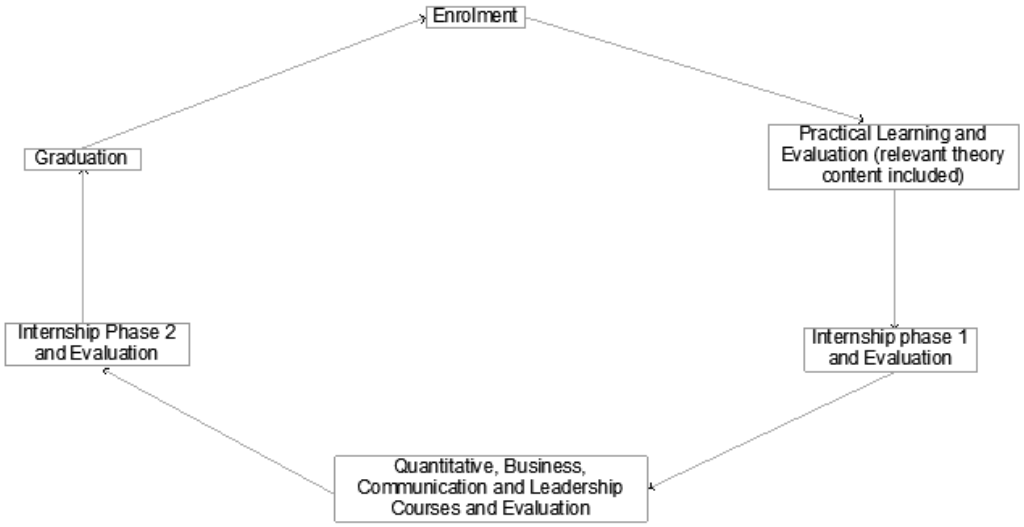
objectives may not be achieved without adequate preparation for teaching. These findings can thus be used to demonstrate lack of or ignorance of professional skills is a one of the causes of skills gap in Kenya.

Comparing and Contrasting Quantitative and Qualitative Findings

The objective was about the influence of instructional methods on student skills development in public TTIs in Kenya. Hypothesis test results showed that there is a statistically significant relationship between instructional methods and student skills development in public TTIs in Kenya. Qualitative data was in agreement with this results as the principals' responses revealed that lecturers had a is a tendency of choosing not to apply pedagogical science knowledge acquired, lecturers opined that instructional methods were less important in technical course instruction as the focus in on hands-on learning and document analysis showing inadequacy of pedagogical sciences among lecturers. Moreover, when qualitative findings show that instructional methods are not significant in skills learning, then that is a fallacy. Relevant instructional method application is inevitable focusing on the principles of instructional pedagogy by Lucas et al (2012), the [TVET ACT], 2013 and the open system theory in conjunction with Tyler's 1949 rationale on instructional methods as key component of technical education. Therefore, the whole question of pedagogical strategies reveals a lot to be desired.

Contribution to knowledge

The study findings revealed that, instruction in the TTIs is skewed towards theory that practical. Learning in TTIs required a balance between the two. In order to address this problem, the study suggests a perceptual model that advocates for a separation of theory learning from practical learning. The model thus provided an environment in which inputs, through puts and out puts are effectively managed, supervision is enhanced, system thinking and effective decision making are made. Therefore, the suggested a conceptual model that is hoped to contribute knowledge require in tacking the issue of skills gap in Kenya.



Source: Field data 2022

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Figure 5.1:
Suggested perceptual framework for addressing instructional issues in TTIs
Source: *The Researcher 2022*

Conclusion

Pedagogical science knowledge is an inevitable factor in the process of skills development. Findings that did not support the importance of adequate pedagogical knowledge for hands-on skills learning could have a trickle-down effect on students and probably cause entropy in the institutions hence perpetuation of skills gap in Kenya. Therefore, the skills development elements need to work as a unity if the issues of skills gap need to be ended.

Recommendations

Technical Training Institutions were found highly theoretical. Therefore, universities and colleges with the mandate of training skill lecturers need to review the entire process of TTI teacher training. Literature reviewed and study findings pointed to the fact that instructional supervision lacked in the TTIs. Therefore, there is need regular audit of the TTIs. Findings revealed that lecturer method was preferred most which should not be the case. This could be as a result of the presence of business courses that might look attract than technical courses. Therefore, technical institutions should not be allowed to duplicate courses offered by universities but focus on hands-on courses only. Clothing Technology studies need to be conducted in a well-equipped institution attached textile industry to enhance practical learning. The government needs to invest in research and allow lecturers to venture into pedagogical new knowledge in order to end issues of skills gap.

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