TVET Institutions and Industry Collaborative Practices on Electronics Laboratory Training for Skill Acquisition among Technician Trainees in Kenya

ABSTRACT

Aims: To find out the TVET-industry collaborative practices that aided electronics laboratory training in Nairobi County, Kenya.

Study design: Qualitative research design.

Place and Duration of Study: Electrical and Electronics Departments of public Technical and Vocational Education and Training institutions in Nairobi County Kenya, between September 2019 and March 2020.

Methodology: The target population comprised of eight (8) HODs and eight (8) electronics experts drawn from electrical and electronics departments in the 8 public TVET institutions in Nairobi County. All HODs were selected for an interview while purposive sampling was used to select experts for a focus group discussion. An interview schedule and a focus group discussion guide were developed and administered face to face. Qualitative data obtained was analyzed using thematic analysis.

Results: Sample sizes for FGD and HODs was 8 each. The response rate was 100% and 75% respectively. The findings of study were that TVET institutions were aware of the skills needed in the industry although the institutions did not have collaboration with the industry. The institutions had tried to incorporate industry skills in laboratory practice on their own without input from the industry.

Conclusion: It was concluded that TVET institutions had little interest in seeking out collaborations with the industry. It was therefore recommended that TVET institutions should develop collaborations with specific industries for purposes of supporting laboratory instruction.

Keywords: Industry, practices, electronics, laboratory, skills, acquisition

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1. INTRODUCTION

Employers seek to increase their productivity by engaging qualified personnel with the right skills. They expect that by the time they are recruiting the graduate trainees from TVET institutions, they are competent enough to undertake the assigned tasks. TVET institutions on the other hand desire to have their graduates attain the required skills to enable them secure jobs in the industry. What this means is that the skills offered in training institutions

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must be congruent with the skills that the industry requires. As such, collaboration between these two entities is a critical component in skill acquisition.

Mulati, Kyalo, and Dimo (2019) points out that collaboration between colleges and industry has a lot of relevance in skills acquisition among trainees. Krivickas and Krivickas (2007) echo the same sentiments. In a study carried out in a polytechnic in Lithuana, the researchers point out that collaboration with industry enhances the success of technical training. The authors, further assert that colleges and industry have symbiotic relationship where industry sourced workers from the colleges and colleges are supposed to receive training support from the industry. Industry provides support to TVET institutions in a number of ways. One of the ways is offering industrial training opportunities for college students to "work in a real environment with modern instruments" (p.195). Another way is through donation of modern laboratory equipment for laboratory training. This makes it possible for training institutions to have enough training equipment. This is evident in a study that was carried out in Australia. The study by Kostulski and Murray (2010) found out that one university had sufficient equipment for laboratory instruction as a result of donations received from the industry. Another way in which the industry supports the training of students to acquire skills is by getting involved in programme design, allowing their staff to work as trainers in TVET programmes as well as collaborating in practical sessions (Ahmadu, 2013).

In spite of the numerous rewards accruable from establishing workable collaboration between TVET institutions and the industry, the link between them is weak and in most cases, ad hoc (Ashmawi, 2015). However, it has been found out that there is no proper collaboration between the training institutions and the industry. In a study carried out in Ghana, Dasmani (2011) found out that there was a weak link between the training institutions and the industry hence whatever skills trainees received were not relevant to the requirements fell short of industrial expectations. In Kenya, Sang, Muthaa, and Mbugua (2012) found out that there was a weak link between TVET institutions and industries. This led to a disconnection between what is taught in colleges and what is needed in the industry.

Despite the weak Although the link between industry and TVET institutions in Kenya is observed to be weak, there is a level of collaboration. It has been established that TVET institutions and industry collaborate majorly on industrial attachment (Makworo, Mwangi, & Nyongesa, 2013). According to Jahonga, Canute, Murey, Otunga, Kiprop, and Kosgey (2016), the industry, to some extent, provides insurance cover for students on attachment, and also provide TVET institutions with training and learning materials. On the provision of materials for training and learning, the authors do not specify the specific materials provided by the industry.

Although, there exists no strong linkage between TVET institutions and the industry in many countries, one thing that cannot be ignored is that the two entities have a symbiotic relationship and cannot run away from one another be separated in as much as they depend on each other. Therefore, collaboration between them is strongly argued. As Ashmawi, (2015) argues, TVET institutions must involve the industry in the education process. Equally employers must actively engage themselves in the process of training students.

From research it has been established that TVET institutions and industry can collaborate effectively. Ahmadu (2013) in a research carried out in Sierra Leone shows a successful case of TVET institution, the Eastern Polytechnic having good collaboration with the industry. The Polytechnic collaborated with the industry on various aspects such as programme design, training the students on skills as well as teaching of relevant theories to the students admitted into the programmes. The results of the collaboration were

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encouraging as students secured jobs on graduation while the industry got employees with the requisite skills ready to undertake the job responsibilities immediately.
The area of electrical and electronics is one of the areas which plays a critical role in many countries of the world including Kenya. Having seen a successful case of collaboration between industry and TVET institution, it is critical to find out what practices exist in Kenya particularly in the area of electronics laboratory practice, the objective of this study sought to find out the TVET-industry collaborative practices that aided electronics laboratory instruction practice.

2. METHODOLOGY

This study focused on eight (8) public TVET institutions located in Nairobi County, Kenya. The target population for this study comprised of Heads of Department and electronics laboratory practice experts in Electrical & Electronics departments. To obtain the respondents, all the 8 HODs were selected for the interviews. For focus group discussion (FGD), 8 participants (one expert from each TVET institution) were purposively selected owing to their in-depth knowledge of the subject under study with the aid of the HODs. This being a qualitative study, the research instruments used were interview schedule and focus group discussion guide. The interview schedule was used for collecting information from HODs while the FGD guide was used to collect information from FGD participants. Data collected for this study was qualitative data which was analyzed using thematic analysis.

3. RESULTS AND DISCUSSION

The findings focused on four aspects of TVET-industry collaborative practices that aided electronics laboratory instruction practice. These are whether TVET colleges were aware of the skills needed by the industry; how they knew about the industry skills needed; how the industry skills are incorporated in laboratory instruction; whether TVET colleges collaborated with industry in electronics laboratory training.

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3.1 TVET colleges awareness of the skills needed by the industry

All the 8 HODs of the various TVET institutions who were interviewed indicated that they were aware of the skills needed by the industry. Equally all the 8 FGD participants agreed with the HODs that they were aware of the skills that were needed by industry/employers.

3.2 How HODs and FGD participants knew the skills needed in the industry

There were several ways that the HODs used to know the skills that were needed in the industry. The main way they knew skill needs of the industry was through the industrial attachment assessment. When assessing the trainees on attachment, the trainers/assessors held discussions with the trainees and also observed what they were doing. These discussions and observations would assist point out what critical skills the trainees needed on the basis of what they performed well and what they did not do well. The trainer/assessor also had conversations with the trainees' supervisors who would point out what skills were critical in the industry. The institutions also got to know the skills needed by the industry through feedback from the industry on weak and strong areas of the trainees which pointed out what the industry needed.

On the other hand, the FGD held pointed out similar ways as HODs. They pointed out that they get feedback from the industry when they go to assess the trainees on attachment. Additionally, the participants added other ways which included: attending workshops, seminars and symposia; monitoring the new developments in emerging technologies; the

internet; innovations during TVET fairs; trainees reporting to their trainers on the specific skills they found lacking while they were on attachment.

3.3 Incorporation of industry skills in laboratory instruction

Incorporation of industry skills in laboratory instruction was a big challenge as many HODs indicated. This was because, although the trainers are aware of the needed skills, the syllabus used was obsolete and static which did not allow for dynamism in training. Many trainers followed curriculum for exam purposes. This was in contrast to the industry which was dynamic and already had automated their operations and also incorporated new technologies. However, as one of the HODs pointed out, that "some trainers try to prepare trainees for what they will find out there in the industry." These they did by engaging the trainees outside the normal teaching hours when both trainers and trainees were free though rare.

The FGD participants agreed with the HODs that incorporating industry needed skills in laboratory instruction is a challenge owing to a number of issues which include: lack of modern equipment and current technology and the nature of the curriculum. However, even with these challenges, the participants indicated that they sometimes refer students to YouTube links on particular aspects of laboratory practice to learn; using laboratory training software to demonstrate the skills. They also indicated that they plan educational visits to industries where students get exposure to the actual equipment and materials.

3.4 TVET colleges and industry collaboration in electronic laboratory training

Interview with HODs revealed that TVET colleges and industries did not have any training collaboration between them. As such, trainers rarely had a chance to upgrade their skills on new equipment and latest technology in the industry. Except during attachment, trainees never have any other opportunity to get training in the industry. Also, trainees only got a chance for exposure to latest equipment and use of electronic equipment and tools during occasional educational field trips when they visit industries. However, this could not help much as they could only view the equipment and not operate them.

Equally, it was found out that because of lack of formal collaboration, there was no donation of equipment from the industry to TVET colleges. However, it is worth noting that some HODs pointed out that, although there was equipment donation to some colleges, it was in other specialty areas like automotive but not in electrical and electronics departments.

The FGD responses, equally, revealed that TVET colleges did not have any formal collaboration with the industry hence there was no partnership in training. This resulted in TVET institutions trainees acquiring skills not relevant with the industry needs. Actually, the FGD participants said that skills acquired by trainees were just basics while the industries needed real hands-on, and problem-solving skills.

These findings are consistent with Dasmani (2011), who found out that there is a weak link between the training institutions and the industry hence whatever skills trainees received were not relevant to the requirements of the industry.

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4. CONCLUSION AND RECOMMENDATIONS

From the findings it was concluded that TVET institutions had little interest in seeking out formal collaborations with the industry which would have been a great support in electronics

laboratory training of the trainees. It was therefore recommended that TVET institutions should develop formal collaborations with specific industries for purposes of supporting electronics laboratory practice.

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CONSENT

Written informed consent was obtained from the respondents for publication of this paper. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

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DEFINITIONS, ACRONYMS, ABBREVIATIONS

Technician Trainee - Refers to a learner undertaking diploma in electrical and electronic engineering course in TVET institution.

TVET - Technical and vocational Education and Training
FGD - Focus Group Discussion
HOD - Head of Department

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