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Research Article

Labor Market

Assessment of Skills Expected by the Employers in the Current Labor Market of Electrical and Electronics Technicians: A Case of Uasin Gishu County

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Globally, unemployment of electrical and electronics graduates is one of the biggest challenges. This study aimed to assess skills that are expected by the employers in the current labor market of electrical and electronics technicians in Uasin Gishu County, Kenya. A mixed-method research approach and a descriptive survey research design were adopted. The Human Capital Theory guided the study. The target population comprised 165 electrical and electronics technicians and 11 electrical and electronics supervisors and their sample size was 55 and 11 respectively. Convenience sampling technique, total population sampling technique and simple random sampling technique were used to obtain the samples. The data collection instruments included questionnaire and interview schedule. A Cronbach's alpha coefficient of 0.87 was attained for the pilot data. The quantitative data was analyzed using SPSS. The qualitative data was analyzed by presenting themes that emerged. Male electrical and electronics technicians, 33 (63.5%), were more than female participants, 19(36.5%). Most electrical and electronics technicians (50.0%) were aged between 20-24 years. Most electrical and electronics technicians 25(48.1%) were craft certificate holders. In respect to employment, most of the electrical and electronics technicians 9(17.3%) were employed by Kenya Power and Lighting Company. A large proportion of the respondents 30(57.69%) strongly agreed that supervisors require skills taught in technical institutions. Skills ($F_{0.05}$ (1,52) = 5.030, $p < 0.05$), ($b = 0.448$, $p < 0.05$) significantly predicted employability. The study's findings were stated and it was observed that there was a significant relationship between employability and skills. The study suggests that skills should be encouraged among the electrical and electronics technicians. The researcher recommends continuous learning and technical skill development through workshops incentives for pursuing advanced degrees that align with industry demands.

Keywords: Skills, Labor Market, Electrical and Electronics Technicians

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1. Introduction

Globally, unemployment of electrical and electronics graduates is one of the biggest challenges (Du et al., 2021). One of the best plan of action accepted by nations that lack a performing labor market is to train the electrical and electronics technicians to be productive in the informal sector (Isaacs, 2020). Electrical and electronics, encompasses technology, education, sciences, attitudes, knowledge, and technical skills related to employment in our socio-economic life (Kiplagat & Kitainge, 2021). In the context of this study, a technician is a person holding a higher diploma certificate, diploma certificate, craft certificate or artisan certificate in electrical and electronics course and therefore qualifies to be employed or do practical work (Akala & Changilwa, 2018).

Electrical and electronics courses are becoming popular and a powerful drive for acquiring practical skills needed for either employment or self-employment (Koros, 2021). The electrical and electronics technician courses help in improving the employability of its graduates for the benefit of the society and sustainability. Electrical and electronics courses need to be realigned, diversified, and accommodative to the industry expectations to achieve these. All else constant, electrical and electronics courses are essential aspect of training with the potential to create employment. However, overwhelming evidence shows that most graduates cannot secure employment (Mseleku, 2022). This study will aim at assessing the Determinants of Employability in Electrical and Electronics Technician Courses in Uasin Gishu County, Kenya.

German has a vocational education system with a dual system of apprenticeship training. It is celebrated for it matches with the industry expectations and equips trainees with vocational skills geared to the current practices in specific professions (Witte & Kalleberg, 1995). The training system tends to match training with employment opportunities available. However, only nearly half of the Germans have jobs that match their vocational education. There are some variables that influence the likelihood of the trainees getting employment that fits their vocational training. Also, the graduates' need to transfer from a job that does not fit their training to positions that do.

There is rapid development of technology in the hyper-competitive industry that is influencing employability of the TVET graduates. The Social Cognitive Theory looks at correlationships among technology, trainees' employability, and Technical and Vocational Education and Training (TVET) institutions' developmental sustainability (Bandura, 2002). Social cognitive theory adopts a self-standing perspective to trainees' development, adaptation and change especially in the usage of technology.

Adequate industry-institution collaborations are important for it leads to delivery of relevant practical skills for industrialization through enhancement of employability skills (Raihan, 2014). It is thus important to have online-means of industry-institution collaborations, suggestions on how to link TVET institutions with the industries, proposals on collaboration initiatives, and identification of the common difficulties encountered during collaboration. This will help to reduce the widening between the practical skills acquired by the trainees in the TVET institutions and the skills demanded by the industries. By the trainees being attached to the industries, they are able to acquire contemporary skills by training and establish networks with TVET institutions for minimizing the skills gaps. Thus, collaboration helps to bridge the skills gap and enhances employability skills of the TVET graduates.

One of the most essential and difficult tasks of any institution or college is to produce graduates with job-ready abilities (Faisal et al., 2019). Because the outcomes have become essential quality indicators, most higher education institutions (HEI's) strive to enhance their graduate employment rates. This aim may be met in a variety of ways, including efforts to improve the profile of a HEI's brand in order to attract the best students and top employers. Other solutions include establishing agreements with companies to set up internships or redesigning a curriculum to ensure the material matches the needs of the employer. Yet, each graduate is unique in terms of experience, knowledge, abilities, attitude, and career possibilities, therefore a graduate's capacity to find work varies.

In Vietnam, formal education consists of twelve years of basic elementary and high school. Students who have completed the 12th grade have several higher education alternatives in both public and private institutions and universities.

Vietnamese higher education institutions are entrusted with preparing an industry-ready workforce for a growing market economy with a socialist bent. Nevertheless, the Ministry of Education's centralized and rigorous management has resulted in primarily outmoded curricula. Conventional, teacher-centered classrooms with passive learning methods remain the norm, and English is rarely utilized as a mode of communication. Lastly, ties between HEIs and industry are still tenuous. Such constraints have led to graduates' continued unhappiness with their skills and capacities (Pascoe et al., 2020).

What can a higher education institution do to improve the employability of its graduates? What can graduates do to increase their chances of landing a job in their field? Why do some grads find jobs while others do not? What do the successful applicants do well? Does the fact that certain HEIs have a greater reputation than others make their graduates more employable? Because of these inquiries, the idea of employability has become an increasingly attractive study issue. In response to this need, this study was aimed to identify the primary factors of employability and assess the impact of these variables on employability in Vietnam's IT sector. Almost 500 Vietnamese IT graduates were specifically polled regarding their talents and job search outcomes. Data analysis indicated that English capabilities, soft skills, flexibility, and the reputation of the graduate's school were all connected to job search success. Moreover, work experience, professional abilities, employability, and job search attempts were major factors influencing job search length.

Recent experience has revealed that even brilliant graduates must wait a long time for employment after graduation. Several graduates, particularly management graduates, are awaiting employment through government recruiting initiatives (Feng, 2019). Many graduates who have graduated receive a certificate, which does not assist them find suitable work. Even if one of the primary goals of university education is to prepare students to confront obstacles in the outside world, they must leave university without adequate self-confidence and certainty for better jobs (Chen et al., 2022). Considering these conditions, graduate unemployment has been a major issue in Sri Lanka during the previous few decades.

In many cases, the fact is that the qualification alone is insufficient to obtain a job due to a mismatch in the labor market's demand and supply. As a result, some graduates must work in irrelevant positions with poor pay, while others must remain unemployed and wait for a long period, usually until the government gives possibilities. Such graduates will burden not just their families, but also the entire country. Frustration, young discontent, violence, and other types of anti-social behavior would result as a result of this. Additionally, the effects of this would be felt in society in the form of short-term or long-term social, cultural, economic, demographic, and political difficulties.

In this context, it is critical to understand why graduates are unable to find acceptable positions as soon as they graduate from the TVET institutions. Why is the country's labor market incapable of absorbing such graduates into the growth process? As a result, the primary goal of this study will be to establish the determinants of employability of electrical and electronics technicians in Uasin Gishu County, Kenya.

2. Literature Review

The unemployment rate among Technicians remains high (Yamada et al., 2018). Yet, the Ethiopian economy is expanding rapidly, and the government has stressed TVET and the development of industrial skills. There is a pervasive mismatch between the practical skills taught at TVET colleges and those demanded in the workplace. As a consequence, trainers were pleased with graduates who possessed a wide range of abilities, whereas industry experts anticipated quality and competency performance.

Trainers frequently emphasize the value of practical skills (Yamada & Otchia, 2020). The trainees, on the other hand, place a high importance on practical abilities. The combination of practical, managerial, and entrepreneurial abilities results in a trained workforce capable of meeting industry expectations in the New World Order. Furthermore, industry standards vary based on how well one identifies industrial conditions and the efficiency of their training. Most trainers prefer traditional teaching methods and overlook Competency-Based Training (CBT), which is cutting-edge and influences trainees' attitudes, motivations, and career goals.

Trainees who work part-time in industries while studying shown competence (Chavan & Carter, 2018). Because TVET did not equip trainees with practical and marketable abilities, it is necessary to revise the curriculum to include employability skills. Matching training to industry expectations is critical and requires prompt attention from the government in order to minimize unemployment among TVET graduates. A country cannot develop both economically and socially. Employment creation is critical. Apprenticeships, on-the-job training, and internship programs are essential for developing graduates with applicable skills, knowledge, and attributes. Governments should give financial incentives and subsidies to service companies, as well as collaborate with TVET colleges to prepare trainees for employment.

As employment grows more dynamic, TVET institutions must update their training. For example, they must place trainees in practice groups to facilitate contacts with the industries. To allow Technicians to obtain work-related skills, they must get enough industrial training. Connecting employment training is a strategy that should be promoted by TVET institutions all over the world.

In Kenya, the hotel and tourist business is driven by supply rather than need, resulting in a lack of practical and technical skills, poor customer service, and insufficient managerial abilities (Francis et al., 2020). As compared to university graduates, graduates from TVET institutions outperform those from universities in terms of creativity, research, and industrial expertise. Good collaboration and partnership between TVET universities and the industry are crucial for Technicians to achieve well and understand industry expectations.

To enhance the curriculum, TVET colleges must benchmark with other schools throughout the world and share ideas through workshops, conferences, and monthly seminars. To bridge skill gaps in technical fields, trainees must grasp both theory and practice in their areas of specialty. Frequent field excursions and internships in diverse industrial divisions for both trainees and trainers will enable them to obtain practical skills and experience. CDACC must unify its certification and curriculum so that Technicians can get international recognition. Initiate refresher programs for trainees; support research to develop new trends in TVET; encourage exchange programs; establish collaborative publications and seminars; and provide scholarships and work-integrated learning to promote knowledge and skills. This outcome is comparable to that of this research, which found that Technicians lacked the necessary abilities to work with the industries.

TVET institutes seldom promote the employment of their alumni (Miseda, 2021). Therefore, Technicians do not meet industrial demands competently. Trainers in third-world nations lack industrial experience. Non-academic talents have been in high demand in sectors for more than four decades. Whole Youth Development (WYD) qualities, which include personal traits such as work ethic, honesty, and integrity, have become vital for trainees in order to survive. The WYD skills teach trainees technical skills, fundamental work skills, and particular skills that allow them to be productive in the workplace in terms of correct communication, teamwork, and displaying strong professional skills. On completion of training, the Technicians should be subjected to competency testing. Also, periodic entrepreneurial surveys could help match electrical and electronics skilling to the dynamic work environment.

TVET institutes help students gain practical skills needed in the tourism and hospitality industries (Olowoyo et al., 2020). According to industry analysts, the majority of Technicians in the hotel business lack the necessary abilities. It is critical that the hospitality curriculum be aligned with the demands of the hospitality sector. Courses in human relations and communication were highly valued in the tourist and hospitality industries. There is a persistent culture in which TVET institutions do not receive appropriate financing for training reasons.

The youngsters attend school and find work in a variety of fields (Tafere & Chuta, 2020). Formal employment, temporary wage jobs, youth cooperatives, family companies, and businesses in operation were among them. Except for one young woman, everybody had found work despite not having a university education. Despite their early ambitions to complete university before working, they began working after completing their TVET, secondary, or elementary schooling. Childhood ambitions have not aided them in obtaining their desired occupations. School is a lengthy process. As a result, the transition to the labor market becomes erratic, with repeated and occasionally reversal transitions.

TVET institutes train and prepare young people to enter the labor force (Nkwanyane et al., 2020). To do this, curriculum must be adaptable and meet industry standards. If the curriculum does not give adequate skills for the industry, it should be examined, changed, and remedied as soon as possible. To design a technology period curriculum in Kenya, the curriculum review process must include CDACC professionals and industry experts.

Technical training serves both educational and professional purposes, as does interaction with industry specialists (Amegah, 2021). Employer engagement has been a major issue for our TVET colleges and must be addressed so that trainees are not disadvantaged in the sector. TVET institutions must have an industry-focused training structure.

3. Theoretical Framework

Human Capital Theory will influence this study (Becker & Woessmann, 2009). Education investments are crucial because they result in the acquisition of practical skills necessary for employment (Nafukho et al., 2004).. The study will look at the association between electrical and electronics technician training and their employability TVET investments should yield higher returns than other investments.

Human Capital Theory will be relevant to this research study because the electrical and electronics graduates with practical skills will be employable in the industries, thus becoming valuable members of the society. Moreover, TVET provides sectors with human capital in the form of electricians who will contribute to the economy's growth.

The resource dedicated to improving human capital has a distinct productivity element. This research focuses at the government financing and grants that TVET institutions get. TVET should increase graduates' efficiency and competency. The adequate training received by Technicians increases their labor productivity, which is the core principle of human capital theory. Despite the fact that many economists embrace the Human Capital Theory, the fact that women are underrepresented in TVET institutions has drawn some criticism.

Because work possibilities are not dispersed based on merit, those capable and productive training habits do not automatically ensure employment.

The training-for-growth approach exaggerates the value of human capital investments and treats training as a sorting mechanism. Training is a costly sorting process used by industry to identify TVET graduates. Individuals who are unable to fund their training at TVET colleges are barred from work, despite having learned through apprenticeship or on-the-job training. Children should attend school in order to gain information and skills. The nation realizes potential economic rewards from Technicians who obtain meaningful work.

Human capital is developed differently among Technicians due to differences in their inherent cognitive talents, norms, and values; ability to exhibit their acquired practical skills; and capacity to benefit from investments in human capital development. TVET outperforms academic education in terms of developing a skilled workforce. As a result, human capital-labor outcome links should synchronize supply-side and demand-side studies. To increase employability, TVET institutions should provide qualified graduates to companies.

4. Research Methodology

The linking and organization of circumstances for data collection and analysis in a way that aims to combine relevance to the study objective with economy in the technique is referred to as research design (Novikov & Novikov, 2019). It should concentrate on the organization of an investigation, reducing the possibility of making incorrect casual inferences from the data (Dasgupta et al., 2020). The research will be conducted using a mixed method approach. This study will use a descriptive survey design, which is a research that is conducted to describe the features of variables in a scenario. Descriptive survey design is concerned with existing circumstances or connections, opinions held, processes in progress, visible impacts, or emerging trends (Pandey & Pandey, 2021).

The descriptive survey design will allow data to be collected without affecting the research variables. The descriptive survey design will also capitalize on the advantages of both quantitative and qualitative research methods. At a lesser cost, descriptive survey design allows for the collecting of data from a large sample group and the generation of conclusions that may be used to represent the entire community.

The researcher assessed skills that are expected by the employers in the current labor market of electrical and electronics technicians in Uasin Gishu County, Kenya. The Electrical and Electronics Industry Supervisors and Electrical and Electronics Technicians in 11 industries Uasin Gishu County were targeted. Because the research tried to discover demographic features, frequencies, trends, and classifications, a descriptive research strategy was an acceptable choice. It will be beneficial because little is known about the research topic.

5. Results

5.1 Data on whether skills influencesemployability of electrical and electronics technicians in Uasin Gishu County, Kenya.

This data was gathered from questionnaires administered to the electrical and electronics technicians and interview of electrical and electronics supervisors in Uasin Gishu County, Kenya. The subsequent discourse under section 4.2.1 gives the findings that were accrued from the research. It discusses the determinants of employability of electrical and electronics technicians in Uasin Gishu County, Kenya.

The first objective of the study was to assess the influence of skills on the employability of electrical and electronics technicians in Uasin Gishu County, Kenya. To achieve this objective, the respondents were asked to respond to questions relating to whether skills influences employability of electrical and electronics technicians in Uasin Gishu County, Kenya. Data was obtained from questionnaires administered using a 5-point Likert scale on electrical and electronics technicians in Uasin Gishu County industries. An interview with the electrical and electronics supervisors in the Uasin Gishu County industries yielded significant results as well that were also analysed. The collected data showed the extent to which skills aspects employability of electrical and electronics technicians in Uasin Gishu County, Kenya.

The survey results regarding the self-assessment of technical skills in electrical and electronics engineering among respondents reveal a spectrum of perspectives. A notable finding is that a significant proportion, 38.5%, disagreed that they possessed excellent technical skills. Conversely, 23.1% agreed that they did have excellent skills. The neutral stance was held by 13.5% of respondents, indicating a moderate level of uncertainty or neutrality regarding their technical capabilities.

Interestingly, 19.2% of respondents strongly agreed that they possessed excellent technical skills, demonstrating confidence in their abilities. On the other hand, a smaller proportion, 5.8%, strongly disagreed, suggesting a minority with a particularly critical view of their technical proficiency.

These findings highlight a diverse range of self-assessments among professionals in the field of electrical and electronics engineering. While a significant number express confidence in their skills, there is also a notable portion that either feels uncertain or perceives room for improvement. This variety of perspectives underscores the complexity and subjectivity involved in evaluating technical competence in such a specialized field.

Moving forward, these insights can inform targeted efforts for skills development and training programs tailored to address both perceived strengths and areas of improvement among professionals in electrical and electronics engineering. By acknowledging and addressing these diverse perspectives, organizations and individuals can better align skill assessments with career development goals and industry standards.

A large fraction of the respondents 15(28.8%) indicated that that they considered electrical system troubleshooting as the most technical skill that they consider the most important in their role, as indicated on figure 4.7. 21.2%, 25.0%, 21.2%, 3.85% noted that circuit design and analysis, programmable logic controllers (PLCs), digital electronics and renewable energy systems respectively, were the most important technical skills for their roles.

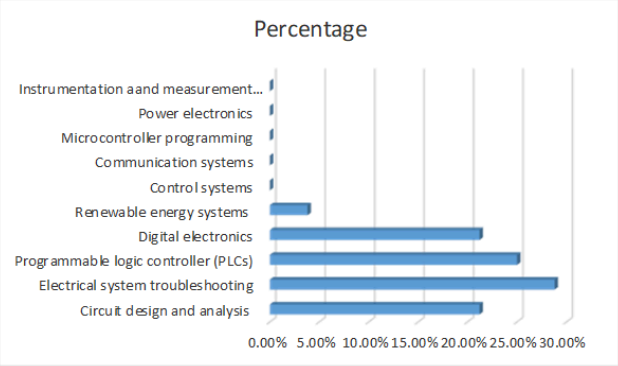

Figure 5.1: Most important technical skill for electrical and electronics technicians (n=52)
Source: (Author, 2024)

Electrical system trouble shooting helps to continuously monitor the power system to ensure maximum continuity of electrical supply with minimum damage to equipment, and property (Paithankar & Bhide, 2022). It is necessary to comprehend the fault characteristics of the particular power system parts when constructing the protective systems. Additionally, one should be aware of the ways that different protective relays trip. Creating such schemes that yield the closest match between the tripping characteristics and the fault characteristics is the responsibility of the protection engineer. Relays must be built in a way that allows them to sense unwanted situations, trip to disconnect the afflicted region, and stay in a restricted state otherwise. Statistical data, however, indicates that more relay tripping incidents are caused by incorrect or insufficient settings than by genuine failures. For this reason, it's essential that students have a solid understanding of power system protection. This could be the reason why electrical system trouble shooting is the most important technical skill to the electrical and electronics technicians.

When respondents were asked whether formal training equips them with skills boosting their employability, majority of the respondents 25(48.11%) agreed, 7 (13.5%) strongly agreed, 16(30.8%) were neutral while 4(7.7%) disagreed as illustrated in Table 4.5.

Majority of electrical and electronics technicians 25(48.1%) strongly agreed that that they could apply theoretical knowledge to practical tasks in their field. 18 (34.6%), 4 (7.7%), and 5 (9.6%) agreed, were neutral and strongly disagreed respectively.

When asked whether the electrical and electronics supervisors required skills taught in technical institutions, 30 (57.69%) strongly agreed while the least 2 (3.85%) were neutral. 5(9.6%), 6(11.54%) and 9 (17.30%) agreed, disagreed and strongly disagreed respectively.

When the electrical and electronics supervisors were asked to give their views on the influence of skills on the employability of the electrical and electronics technicians, the majority cited " while academic qualifications are essential, the practical skills and abilities of electrical and electronics technicians play a crucial role in determining their employability in Uasin Gishu County, Kenya. Continuous improvement of technical skills, coupled with strong soft skills and adaptability, can significantly enhance their career prospects in this field."

Table 5.2: Respondents opinions on influence of skills on employability in Uasin Gishu County, Kenya

Statement	SA	A	N	D	SD
I have excellent technical skills in E&EE	10 (19.2%)	12 (23.1%)	7 (13.5%)	20 (38.5%)	3 (5.8%)
Formal training equips technicians with skills boosting employability	7 (13.5%)	25 (48.11%)	16 (30.8%)	4 (7.7%)	- -
I apply theoretical knowledge to practical tasks in my field	25 (48.1%)	18 34.6%	4 (7.7%)	-	5 (9.6%)
Supervisors require the skills taught in technical institutions	30 (57.69%)	5 (9.6%)	2 (3.85%)	6 (11.54%)	9 (17.30%)

Key: SA – Strongly Agree, A – Agree, N – Neutral, D – Disagree, SD - Strongly Disagree
Source: Author (2024)

The study of variable interactions is done using regression analysis. Regression analysis was used in the study to determine whether or not skills had a substantial impact on electrical and electronic technicians' employability. The outcomes were shown in Table 5.3.

Table 5.3: Regression analysis to assess the influence of skills on the employability of the electrical and electronics technicians in Uasin Gishu County, Kenya

Objective	Regression Weights	Beta Coefficient	R^2	F	P-value	Research Question Supported
O1	S→EE	.449	.0067	5.030	.025b	Yes

Note: *P > 0.001, S: Skills, E: Employability

Table 4.6 shows the summary of the findings of the regression analysis done to establish whether skills had a significant impact on employability of the electrical and electronics technicians in Uasin Gishu, Kenya. The dependent variable employability was regressed on predicting variable skills. Skills significantly predicted employability, $F(1,52) = 5.030$, $p<0.05$, which indicates that the skills played a significant role in shaping the employability of the electrical and electronics technicians ($b=0.449$, $p<0.05$). These results clearly direct that there is a significant effect of the skills on employability of the electrical and electronics technicians. Moreover, the $R2 = 0.0067$ depicts that the model explains 0.67% of the variance in employability.

According to (Makarova et al., 2019), engineering courses are viewed as being male-dominated, thus most scientists are overwhelmingly male Female trainees assess engineering courses as masculine when it came to gender disparities. Thus, gender-based assumptions about math and science may have an impact on young men's and women's aspirations to enroll in STEM programs. Consequently, a less pronouncedly male perception of science has the potential to boost interest in STEM careers.

6. Conclusion

Employability is fundamentally influenced by a multifaceted interplay of technical (hard) skills and transferable (soft) skills, with each category contributing uniquely to an individual's readiness and attractiveness to potential employers. Technical skills, soft skills, and specialized knowledge acquired through training and experience enhance an individual's ability to perform specific job tasks effectively. Employers value candidates who possess a diverse skill set that aligns with job requirements and organizational needs.

Recommendations

The research study recommends skills development. There is need for the electrical and electronics technicians to pursue continuous learning and technical skill development through workshops, online courses, and professional certifications. Technical skills training programs would equip the technicians with in-demand technical skills relevant to their industry and provide opportunities for enhancing communication, teamwork, problem-solving, and leadership skills, which are crucial for professional growth.

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