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TERTIARY INSTITUTIONS AND EMPLOYABILITY: A CASE STUDY ON ELECTRICAL TECHNOLOGY GRADUATES' ATTRIBUTES

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Abstract

This paper examines the view of employers of electrical technology graduates on the kinds of knowledge, skills and attributes valued in the workplace. Empirical data were gathered through the questionnaires that were administered to employers of electrical technology graduates. Pie chart, mean rating and correlation analysis were used as the statistical tools. The data generated served as a barometer of employer views on the quality of electrical technology graduates and standards generally expected from tertiary institutions. The analysis of attributes shows that employers consistently rated the importance of attributes higher than their satisfaction with graduates' display of the same attributes. The views of employers on the quality of electrical technology graduates are but one form of data in exploring the relationship between tertiary institutions and employability and the degree of fit between expectations and what can be delivered in the form of graduates who need to demonstrate a range of attributes in the changing workplace. The curriculum of educational institutions, especially at the tertiary level, must be structured to be more relevant to the needs and status of the Nigerian society. This will ensure national development.

Keywords: employability, technical skills, generic skills, national aspiration and transdisciplinary skills.

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Introduction

The term 'graduate employability' in recent years has become an issue of concern. The changing nature of the world of work has placed increased emphasis on the employability of tertiary institutions' graduates, especially electrical technology graduates. Electrical technologists work side by side with engineers, assisting them in designing and producing electrical equipment, parts and computer systems. They also repair damaged devices, produce diagrams and run performance tests, troubleshoot issues and compile data into detailed reports. IEEE (2001) asserted that engineers, technologists, and technicians join together to form a problem-solving and solution-implementing team. Cheshier (2015) noted that engineering technology is a demanding field of study; even a student with excellent preparation and strong ability will not succeed without a high level of commitment. This emphasises the need for electrical technology graduates with high levels of skills.

Harvey (2001) maintained that the primary role of higher education is increasingly to transform students by enhancing their knowledge, skills, attitudes and abilities while simultaneously empowering them as lifelong critical, reflective learners. This ensures national development. Akoojee (2007) maintained that in a globalised world, education and training for individual and national development is essential. The author also maintained that without skills, the capacity for individual and societal development is considerably stunted. The world of work has changed significantly over the last few years; consequently, technical skill is no longer enough to secure graduate employment. The term "Employability" includes the ability to find employment and remain employed. The Ministry of Higher Education Malaysia (2012) indicated that employability is defined as the potential to secure, maintain, and grow in a particular job at the workplace. George and Rawlinson (2012) indicated that employability includes a range of attributes, including formal and actual competences, interpersonal skills, and personal characteristics. Attributes are the qualities, skills and understanding students should develop during their time with the institution. These attributes include, but go beyond, the disciplinary expertise or technical knowledge that has traditionally formed the core of most institutions' programmes. They are qualities that also prepare graduates as agents for social good in an unknown future (Bowden, 2000).

The assumption is that links between higher education and industry are necessary in order for work demands to shape the curricula of higher education and also shape the kinds of graduates that institutions produce. Griesel (2002) noted that while there has always been some form of relationship between higher education and the economy, this has recently been sharpened by a renewed sense of accountability and relevance on the part of institutions and by the pervasive view that higher education does not produce the right kinds of graduates to meet changing workplace demands. It has become common cause for employers to express concern

about the gap between the outcomes of higher education (in terms of quality, type and quantity of graduates) and the needs of the economy (Yorke 2006; Harvey 2001).

A question that quickly comes to mind is what higher education is expected to deliver and how it should respond. On the one hand, the traditional role of universities is being challenged, and notions of academic liberalism are viewed as outdated (Jones, 1996). While the need for skilled and knowledgeable Electrical Technology graduate workers necessitates a close link between higher education and industry, this paper argues that it also compels an accurate understanding of what it is that tertiary institutions can best deliver. What are the qualities that are required from graduates, and in what ways do notions of 'graduateness' mesh with the expectations of employers?

The fact remains that a link between the efforts (or lack thereof) of tertiary institutions and the extent and type of employment of graduates has some consequences attached to it. As Harvey (2001) pointed out, a causal link implies that higher education institutions should be able to equip graduates with attributes that are in line with what an employer is looking for. While this demand seems to be a common perception, two realities need to be kept in mind: first, qualities or attributes displayed in the workplace may have more to do with the individual's socio-cultural circumstances than with what a specific institution can impart through its curriculum. Again, the ideal qualities of 'graduateness' might be different from the reality of employment practices. For example, the demands of an industry in developing countries such as Nigeria may be different from what has come to be taken for granted in the global imperatives that drive new modes of work and knowledge production.

The Federal Republic of Nigeria (2004) stated that the importance of tertiary education in Nigeria is to

- Contribute to national development through high-level, relevant manpower training
- Develop and inculcate proper values for the survival of the individual and society
- Develop the intellectual capability of individuals to understand and appreciate their level and external environment
- Acquire both physical and intellectual skills which will enable individuals be self-reliant and useful members of the society
- Promote and encourage scholarship and community service
- Forge and cement national unity
- Promote national and international understanding and interaction

Simply put, the purpose of tertiary education is to prepare young people for the job market; to have sustainable employment by enhancing technical skills and competence in a chosen field and life skills such as problem-solving and analytical skills, effective communication and literacy skills, interpersonal and team skills, etc. Globally, tertiary education is believed to

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be the core of human resource development. However, the current education system in Nigeria does not appear to be producing graduates with these generic and essential skills; hence, the continuous increase in the rate of youth unemployment – 24 million jobs are needed over the next ten years to reduce the current unemployment level by half. Olu (2011) noted that Nigeria has a serious jobless growth problem. Balogun (2010) stated that with over 40 million Nigerians effectively unemployed in a population of 242.4 million, no doubt Nigeria has one of the highest unemployment figures in the world despite her economic potential.

Large numbers of graduates have continuously been found incapable of meeting up with the employment requirements of the workforce and have thus been unsuccessful in either securing or keeping a job. This employability problem has been described as a result of poor funding of tertiary institutions, undue interference by various external entities, outdated curricula, poor and bloated staffing, overcrowding and incompetence in the management of many of our tertiary institutions.

This study aims to develop insight into:

- What employers of electrical technology graduates consider priority attributes.
- Employers' satisfaction with the degree to which electrical technology graduates manifest these attributes.
- Employers' views on the role of higher education in preparing Electrical Technology graduates for the changing needs of the workplace.

Method

The study adopted a survey research design. The design was considered suitable for this study because this study needs public opinion. Survey research design employs the study of different sizes of populations to find out their relating opinions, distributions and interrelations about prevalent issues and problems of the societies. According to Nwama (1982), survey has the advantage of permitting description of conditions as they exist in their natural settings. This design was considered suitable for eliciting information from the respondents because the respondents are located over a wide area.

Empirical data were gathered through the questionnaires that were administered on employers of electrical technology graduates. Pie chart, mean rating and correlation analysis were used as the statistical tools. The data thus generated served as a barometer of employer views on the quality of electrical technology graduates and standards generally expected from tertiary institutions. Small, medium and large organisations in the major industrial centres were targeted. A total of 140 respondents responded to the questionnaire. Senior personnel were deliberately targeted because of the assumption being that they would be in a position to evaluate both the priority attributes in the workplace, and the degree to which graduates manifest such attributes.

Table 1

Type of Organisation

Type of Organisation	Percentages
Small	34
Medium	50
Large	56

Table 1 shows a breakdown of the organisations that participated in this study.

Table 2

The Position of the Respondents

Position	Percentage
Manager	34
Director	17
Officer	56
Partner/owner	22
consultant	11

Table 2 shows the breakdown of the employers who participated in this study.

The breakdown shows 16 percent female and 84 percent male. This indicates under-representation of females in the management cadre.

A distinct limitation exists with the focus on electrical technology graduate attributes. There is a difficulty in knowing what is meant by 'qualities' or 'attributes' that entail a range of competencies and abilities – knowledge, skills, approach, intellect and attitude – and which are labelled by employers and educationists alike. Harvey (2001) illustrated the difficulty of terminology with the example of "communication skills" and pointed out that what one organisation means may be entirely different from another, which in turn may differ substantially from what a teacher in higher education implies by the term. This example also illustrates that the attributes individuals develop are context-bound in the sense that they become instantiated in a specific community or context of meaning and practice. The question or challenge becomes do tertiary institutions

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develop attributes that fit the demands of the workplace, given the obvious assumption that institutions in varying ways endeavour to align curricula with what we have referred to as the demands of the employers. And are these attributes applicable to what is also referred to as '21st-century knowledge demands'?

Results

Analysis of Attributes

The most frequently cited attributes were clustered into four groups:

- basic skill and understanding
- knowledge and intellectual ability
- workplace skills and applied knowledge
- interactive and personal skills

The mean rating and the rank position of each attribute are given in relation to employers' views of the importance of and their satisfaction with attributes. The rating is based on a five-point scale with five being the highest rating. A stronger instructive analysis, especially for curriculum planners and developers, is given in the graphic comparison of the relation between importance and degree of satisfaction of the attributes. This highlights the attributes that employers regard as important yet with which they are dissatisfied.

Table 3

Basic skills and understanding

Attributes	Mean rating	Rank
9. Technical ability	4.37	1.000
2. Prior work experience	4.36	2.000
1. Ability to use new information	4.14	3.000
6. Ability to find and access information	3.96	4.000
7. Oral presentation skills	3.92	5.000
4. Computer literacy	3.76	6.000
5. Ability to use information technology	3.74	7.000
3. Written communication skills	3.70	8.000
8. Ability to handle large amounts of information	3.69	9.000
10. Numeracy	3.14	10.000
11. Knowing the organisation	3.05	11.000

The data presented in Table 3 above revealed that all the attributes had their mean above the cut-off point of 3.5 except numeracy and knowing the organisation. Numeracy and knowing the organisation attributes are unimportant to the employers. On the other hand, the employers

consider technical ability, prior work experience and the ability to use new information very important.

Table 4

Employer's Degree of Satisfaction

Attributes	**Mean rating**	**Rank**
4. Computer literacy	3.68	1.000
10. Numeracy	3.57	2.000
6. Ability to find and access information	3.39	3.000
5. Ability to use information technology	3.38	4.000
11. Knowing the organization	3.21	5.000
8. Ability to handle large amounts of information	2.76	6.000
3. Written communication skills	2.57	7.000
7. Oral presentation skills	2.49	8.000
2. Prior work experience	2.45	9.000
9. Technical ability	2.07	10.000
1. Ability to use new information	1.92	11.000

Two observations are outstanding: first

- The mean rating of the importance of attributes is higher than employers' satisfaction.
- The rank orders of the importance of attributes and employers' satisfaction are clearly different.
- All the attributes had their mean below the cut-off point of 3.5 except computer literacy and numeracy.

The observation that is clearly obvious is that the employers are not satisfied with the degree to which electrical technology graduates display the attributes they consider important apart from computer literacy. One may be tempted to reason that the result attached to computer literacy is the product of independent learners who have learnt to learn in the sense of being able to make use of computers.

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Table 5

Knowledge and Intellectual Ability According to Their Importance

Attributes	Mean rating	Rank
8. Understanding of core principles & processes	4.11	1.000
7. Interest in ideas and desire to continue learning	3.94	2.000
3. Specialist discipline knowledge	3.86	3.000
12. Ability to establish part-whole relations – i.e., to relate a specific issue to the broader whole	3.79	4.000
10. Ability to summarise key issues	3.66	5.000
1. Ability to follow and construct logical argument	3.65	6.000
11. Rapid conceptualisation of issues	3.64	7.000
9. Critical and analytic ability	3.40	8.000
2. Enquiry and research skills	3.22	9.000
5. Ability to formulate and check hypotheses and Assumptions	2.68	10.000
6. General knowledge about local and global affairs	2.11	11.000
4. Understanding of economic realities	2.02	12.000

The data presented in Table 5 revealed that all the attributes had their mean above the cut-off point of 3.5 except items 9, 2, 5, 6 and 4. On the other hand, the employers consider understanding of core principles and processes, interest in ideas and desire to continue learning and specialist discipline knowledge very important.

Table 6

Employer's Degree of Satisfaction

Attributes	Mean rating	Rank
6. General knowledge about local and global affairs	3.16	1.000
4. Understanding of economic realities	3.06	2.000
5. Ability to formulate and check hypotheses and Assumptions	2.92	3.000
12. Ability to establish part-whole relations – i.e., to relate a specific issue to the broader whole	2.88	4.000
11. Rapid conceptualisation of issues	2.70	5.000
10. Ability to summarise key issues	2.49	6.000
9. Critical and analytic ability	2.45	7.000
7. Interest in ideas and desire to continue learning	2.44	8.000
1. Ability to follow and construct logical argument	2.43	9.000
2. Enquiry and research skills	2.16	10.000
8. Understanding of core principles and processes	2.15	11.000
3. Specialist discipline knowledge	2.09	12.000

Two observations are outstanding:

- The mean rating of the importance of attributes is higher than employers' satisfaction.
- The rank orders of the importance of attributes and employers' satisfaction are clearly different.
- All the attributes in Table 6 had their mean below the cut-off point of 3.5. The implication is that the employers are not satisfied with the rate with which the electrical graduates display knowledge and intellectual ability.

The observation that is clearly obvious is that the employers are not satisfied with the degree to which electrical technology graduates display the attributes they consider important.

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Table 7

Workplace Skills and Applied Knowledge According to Their Importance

Attributes	Mean rating	Rank
7. Ability to recognise a problem situation	3.94	1.000
3. Ability to monitor and evaluate own work-related Actions	3.92	2.000
6. Ability to plan and execute tasks independently	3.83	3.000
2. Ability to devise means to improve on actions	3.69	4.000
9. Ability to choose appropriate information to address problems	3.63	5.000
11. Appropriate approach to problem-solving	3.47	6.000
8. Ability to apply knowledge to new situations	3.41	7.000
10. Intellectual flexibility and adaptability	3.38	8.000
4. Understanding of modern workplace demands	3.31	9.000
1. Ability to deal with different cultural practices	3.16	10.000
5. Ability to relate specific issues to wider organisational context	2.15	11.000

The data presented in Table 7 revealed the importance of the workplace-skills.

Table 8

Workplace Skills and Applied Knowledge According to Their Satisfaction

Attributes	Mean rating	Rank
1. Ability to deal with different cultural practices	2.99	1.000
2. Ability to devise means to improve on actions	2.72	2.000
10. Intellectual flexibility and adaptability	2.64	3.000
5. Ability to relate specific issues to wider organisational context	2.63	4.000
9. Ability to choose appropriate information to address problems	2.50	5.000
4. Understanding of modern workplace demands	2.41	6.000
3. Ability to monitor and evaluate own work-related Actions	2.39	7.000
7. Ability to recognise a problem situation	2.34	8.000
8. Ability to apply knowledge to new situations	2.12	9.000
6. Ability to plan and execute tasks independently	2.01	10.000
11. Appropriate approach to problem-solving	1.73	11.000

The observation that is clearly obvious is that the employers are not satisfied with the degree to which electrical technology graduates display the attributes they consider important.

In summary, the results from employers' views on the role of higher education in preparing electrical technology graduates for the changing needs of the workplace confirm the view that there is not a sufficiently strong fit between graduate attributes (what higher education delivers) and the demands of the workplace. This fact is highly highlighted with the employers' views on the importance of attributes and their degree of satisfaction with graduates' display of these attributes in the workplace.

Discussion

The purpose of tertiary education is to prepare young people for the job market; to have sustainable employment by enhancing technical skills and competence in a chosen field and life skills such as problem-solving and analytical skills, effective communication and literacy skills, interpersonal and team skills, etc. Globally, tertiary education is believed to be the core of human resource development. Tertiary education is the final stage in the education process and precedes the stage of employment. It is the level at which students derive the necessary skills and knowledge to enable them to function effectively in the work environment. Hence, it is imperative that these tertiary institutions ensure that their graduates are "employable" and make them productive contributors to the labour market.

However, the current education system in Nigeria does not appear to be producing graduates with these generic and essential skills; hence, the continuous increase in the rate of youth unemployment – 24 million jobs are needed over the next ten years to reduce the current unemployment level by half (Phillips Consulting, 2014). Olu (2011) noted that Nigeria has a serious jobless growth problem. Balogun (2010) stated that with over 40 million Nigerians effectively unemployed in a population of 242.4 million, no doubt Nigeria has one of the highest unemployment figures in the world despite her economic potential.

Nigeria had long realised the role of tertiary education in nation-building by the establishment of a series of educational reforms. Some of the educational reforms, Millennium Development Goals and Transformation Agenda, were dedicated to improving education. On the other hand, the transformation agenda, which was initiated in 2011, was targeted to reform the Nigerian economy by creating millions of new jobs and promoting infrastructural development. This would help to ensure that Nigeria becomes one of the world's top 20 economies by the year 2020 – Vision 2020.

It is sad to note that all the federal government efforts have not achieved the desired goals of sustainable industrial growth and development of the nation. According to (Phillips Consulting, 2014) 62% of employers do not think tertiary institutions are doing a good job of producing successful graduate employees.

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The data generated in this study on employer views shows areas that require greater attention in tertiary institutions in Nigeria. If the top-ranking attributes across the three clusters are taken together – in terms of the relationship between importance and satisfaction – an interesting picture emerges that seems to highlight the role of tertiary institutions in producing graduates that meet the demands not only of the world of work but indeed of the 21st-century world.

Table 9

Top Ranking Attributes in Terms of Importance and Employer Satisfaction

Attributes	**Importance**	**Mean of Employers" Satisfaction**
Basic skills and understanding	Technical ability	2.07
	Prior work experience	2.45
	Ability to use new information	1.92
Knowledge and Intellectual Ability	Understanding of core principles & processes	2.15
	Interest in ideas and desire to continue learning	2.44
	Specialist discipline knowledge	2.09
Workplace skills and applied knowledge	Ability to recognise problem situation	2.34
	Ability to monitor and evaluate own work-related Actions	2.39
	Ability to plan and execute tasks independently	2.01

Given the deliberate targeting of senior personnel in the human resources divisions of organisations, it is perhaps predictable that the emphasis would be on applied competencies. as the table above shows. This finding is consistent with the findings of Lawton. Lawton (2008) maintained that employers demand that graduates have developed 'employability skills' and can 'hit the ground running' when they enter the workplace. The implication of

these changes, combined with the expansion of institutions, has resulted in employers being more explicit in the skills they expect from graduates. This finding is also consistent with the findings of Cheshier. Cheshier (2015) noted that engineering technology is a demanding field of study; even a student with excellent preparation and strong ability will not succeed without a high level of commitment. This highlights the need for electrical technology graduates with high levels of skills. Harvey (2001) maintained that the primary role of higher education is increasingly to transform students by enhancing their knowledge, skills, attitudes and abilities while simultaneously empowering them as lifelong critical, reflective learners. Similarly, Jones (1996) refers to curriculum relevance being tested against the development of "personal transferable skills" and students' ability to learn, given the recognition that becoming a lifelong learner is perhaps the most important asset of a flexible graduate in a changing world of work.

However, it also seems feasible to conclude that the attributes that are considered to be the most important, yet the employers are not satisfied with, illustrate that curricula in the tertiary institution have not sufficiently shifted in line with the demands of the changing world of work. The data presented revealed that all the items had their mean below the cut-off point of 3.5. As seen from the responses, employers are of the opinion that post-secondary education does not prepare electrical technology graduates for the changing needs of the workplace. The teaching curriculum of educational institutions, especially at the tertiary level, must be realigned to make it more relevant to the needs and status of the Nigerian society. This will ensure national development.

Findings

1. Employers of electrical technology graduates consider technical ability, prior work experience and ability to use new information as priority attributes.
2. The employers are not satisfied with the degree to which electrical technology graduates display the attributes they consider important.
3. The views of employers of electrical technology graduates are the following: i. Tertiary institutions do not prepare electrical technology graduates for the changing needs of the workplace. ii. The teaching curriculum of educational institutions, especially at the tertiary level, must be relevant to the needs and status of the Nigerian society.

Conclusion

The views of employers of electrical technology graduates are the following: i. Tertiary institutions do not prepare electrical technology graduates for the changing needs of the workplace. ii. The teaching curriculum of educational institutions, especially at the tertiary level, must be relevant to the needs and status of the Nigerian society. This will ensure national development.

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