

Partnership between TVET Training Institutions and Industry: A Survey of Industrial Experience of Academic Staff of Accra Polytechnic

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Abstract

Tertiary education in general and polytechnic education in particular has undergone a great deal of transformation during the last 50 years. As part of a sustained and continuous process of optimizing the quality of skill training required in the country, the Government of Ghana is in the process of converting the Polytechnics in the country into Technical Universities at the beginning of 2016 academic year. Industrial experience of academic staff is one of the key requirements given by a Technical committee set up by the government in the proposed bill. It is against this background that this study was conducted to assess the industrial experience of staff of Ghanaian Polytechnics with Accra Polytechnic as a case study. Using descriptive statistical tools, an analysis was conducted on the industrial experience of all the 189 full time academic staff of the institution. Key findings in the study are that, about 51 percent of the teaching staff have some form of industrial experience relevant to their areas of specialization and the average years of industrial experience for staff in the school of engineering is the highest. The study recommended amongst others, the need for a national governmental policy to incorporate staff industrial internship into faculty development scheme to help foster partnership between TVET training institutions and industry.

Keywords: Industrial experience, TVET, Technical University, Partnership

1. Introduction

Education is necessary for socio-economic development of any society. In fact, there has never really been any argument over the link between education and development because education helps to build national capacity to apply science and technology to social and economic problems. Technical and Vocational Education and Training aims at providing graduates with practical knowledge and skills which are required at work place. It is the sector that produces the requisite technical and professional manpower in adequate numbers for sustainable national development. It is obvious that education in general and technical and vocation education in particular is the key to increased productivity. In line with this view, Okolocha (2006) stated that technical and vocational education is the bedrock of sustainable development of any nation. Technical education is said to be a comparatively new phase of vocational education which is designed to meet the complex technological needs of modern industries. It is worth nothing that all technical education programmes are vocational but not all vocational education programmes are technical. Technical and vocational education, according UNESCO & ILO is that form of education which begins with broad base facilities. TVET education emphasises horizontal and vertical articulation within the education system and between school and the world of work, thus contributing to the elimination of all forms of discrimination. It also prepares the individual for lifelong learning through developing the necessary mental tools, technical and entrepreneurial skills as well as attitudes.

The history of industrial development and technical and vocational education are naturally inseparable. They must be treated together if one would understand their independence. For Technical and Vocational Institutions to achieve their desired objectives, courses must be taught in their practical application to their various industries. The learning outcomes are geared towards producing graduates who are well equipped with knowledge, competencies and qualities needed for executing activities in relation to a particular field of study. Technical and Vocational Training Education runs across all sectors of social and economic development. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 1989) and International Labour Organization (ILO), TVET has a role to play in architecture, journalism, agriculture, fishing, accounts, water, hotel, minerals, natural resources, pilot, transport, law and many more. It includes all professions of engineering, science, technology, metal crafts, seamanship, arts and culture etc.

Higher education in general and polytechnic education in particular has undergone a great deal of transformation during the last 50 years. As part of a sustained and continuous process of optimizing the quality of skill training required in the country, the Government of Ghana is in the process of converting the Polytechnics in the country

into Technical Universities at the beginning of 2016 academic year. Industrial experience of academic staff is one of the key requirements given by a Technical committee set up by the government in the proposed bill. It is against this background that this study was conducted to assess the industrial experience of staff of Ghanaian Polytechnics with Accra Polytechnic as a case study. The industry is an important partner in the skill training regime of any country. It is the industry that provides the competency standards, professional task descriptions and testing centers among other necessary tools. According Ferece Marton (1996), It is a fact that the work place keeps changing and so do the demands of the employers as technology evolves. Training is essential to face up to the challenges of growth, competitiveness and employment. This implies that all relevant actors have to play their role: public authorities and the private sector, i.e. employers, organizations and trade unions. The involvement of the social partners acts as a guarantee for the maintenance of standards and quality as well as safeguarding of investments in vocational training. Given the instability of the present employment situation and the lack of qualified workers owing to the increasing pace of change, social partners should create responses which go beyond short term needs and improve the correlation between changes in the training field and global changes in the economic and social environment.

2. Methodology

Using descriptive statistical tools, an analysis was conducted on the industrial experience of all the 189 teaching of Accra Polytechnic. Personal interviews and analysis of curriculum vitas of the institution's teaching staff was done to generate the primary data used for the study. The Polytechnic is organized into three schools for academic work. These are the schools of Applied Sciences and Art, Engineering and Business and Management. There are five academic departments in each school in the institution. There was the need to ascertain whether all the departments can boast of staff with relevant industrial experience and test the hypothesis that their numbers follow the uniform distribution with respect to the departments. A chi squared test which allows comparison of a collection of categorical data with some theoretical expected distribution was used. For a set of normal and independent variables, X_1, X_2, \dots, X_v and we normalize them by taking their respective standard normal

$$\text{values } Z_1 = \frac{X_1 - u_1}{\sigma_1} \sim N(0,1) \quad Z_2 = \frac{X_2 - u_2}{\sigma_2} \sim N(0,1), \dots, \quad Z_v = \frac{X_v - u_v}{\sigma_v} \sim N(0,1)$$

The sum of squares of the normalized variables has a Chi – square (χ^2) distribution

$$\chi^2 = \sum Z_i^2 = \sum \left(\frac{X_i - u_i}{\sigma_{x_i}} \right)^2$$

with v degrees of freedom. The number of degrees of freedom is equal to the number of independent variables. The chi-square distribution is skewed to the right, starts from the origin and extends to $+\infty$ to the right tail. As n increases, the χ^2 distribution becomes more and more symmetric. The mean and variance of a χ^2 distribution with v degrees of freedom are $E(\chi^2) = n$ $\text{var}(\chi^2) = 2n$.

3. Findings and Discussions

3.1 Industrial Experience of Academic Staff

Table 1: Industrial Experience of Staff

Departments	Number of Staff in Dept	Number of Staff With Industrial Experience	Percentage
Applied Sciences and Arts			
Hotel Catering and Institutional Management	11	6	54.55
Fashion Design and Textile	11	6	54.55
Computer Science	8	2	25.00
Science Laboratory Technology	21	9	42.86
Mathematics and Statistics	9	4	44.44
Business and Management			
Accountancy	17	9	52.94
Marketing	15	7	46.67
Purchasing and Supply	12	9	75.00
Secretaryship and Management Studies	11	4	36.36
Languages and Liberal Studies	15	5	33.33
Engineering			
Mechanical Engineering	13	6	46.15
Building Technology	16	13	81.25
Civil Engineering	13	5	38.46
Electrical/Electronic Engineering	11	6	54.55
Furniture Design and Production	6	5	83.33
Total	189	96	50.79

The survey did an indepth study into the backgrounds of the 189 teaching staff of the institution; focusing on their industrial experience. Relevant industrial experience is here taken as work of a technical nature that is related to the courses being taught in the department. The number of academic staff with relevant industry experience is as in table above. It shows that at least 25% of staff in all academic departments have some form of industrial experience. The school of engineering has the highest average of 60 % whilst the building department and the Building Technology department have more than 80% of their staff with industrial experience. About 51 % of all the academic staff have some form of relevant industrial experience.

3.2 Years of Industrial Experience

Table 2: Years of Industrial Experience

Category	Number of Staff	Percentage
Less than 2yrs	18	18.8
2 to 5 yrs	40	41.7
More than 5 yrs	38	39.5
Total	96	100

The table 2 above shows the years of industrial experience of staff. Whilst about 18.8% have less than 2 years of relevant industrial experience, 41.7% have 2 to 5 years of experience and 39.5% having more than 5 years of working experience. This means 80 % of the staff have more than 2 years of working experience.

3.3 Relevance of Experience by School

Table 3: Relevance of Experience

School	Number of Staff	Percentage
Applied Science and Arts	27	28.1
Business	34	35.4
Engineering	35	36.5
Total	96	100

The number of staff with years of industry experience relevant to their areas of study in the various schools is as shown in the table 3 above. The school of engineering has the highest percentage of 36.5% whilst that of the School of Business, and the School of Applied Science and Arts are 35.4% and 28.1% respectively.

To test the hypothesis that the number of staff with relevant industrial experience in the departments follows a uniform distribution, a goodness of fit test is conducted. Using $\alpha = 0.05$, the χ^2 critical value with 14 degrees of freedom is 23.685. The computed chi squared test statistic is 15.875 which is less than the critical value. The null hypothesis of the number of staff with relevance experience following a uniform distribution is therefore accepted.

Polytechnic education in Ghana offer some sort of internship program. These programs offer students the opportunity to work at a firm in a certain industry for a short time. This gives the intern the opportunity to learn the language of the industry and see what working in the industry is like. This experience can be used by the student after graduation when he or she is applying for a job in the same industry. Having relevant industry experience means the person knows the language of the industry and can quickly contribute to the success of the sector. The rapid industrialization of any nation is tied to acquisition of vocational and technical education. Fundamentally, it is a systematic way of exposing individuals to the practical training of developing and producing goods and services for the citizens in any country. Ghana as a developing country is yet to achieve the benefits of the full potentials of technical and vocational education. The government is in the process of repositioning the polytechnics in the country to achieve the benefits of TVET education. Industrial background of instructors has become an important variable in this national strategy of repositioning the polytechnics. The study reveals that in this regard, Accra Polytechnic as a tertiary technical and vocational institution is qualified and ready to contribute to an improved industrial productivity in the Ghana.

4. Conclusion

Nations of the world are confronted with the challenges to improve the capacities of their workforce to respond to their own national development needs and to the demands of a rapidly changing more globally competitive world. The nation must adopt strategies for enhancing industrial development through technical and vocational education. This must include but not limited to review of curriculum, provision of well equipped workshops and laboratories, proper funding as well as training and retraining of teaching and supporting staff. The training content needs updating and the quality of teaching and learning be improved. The training institutions for technical and vocational institutions must have adequate opportunities for practical training in both the formal and informal sectors of industry. Without a strong linkage between industry and the technical and vocational education sector, a large percentage of students who are admitted into the technical institutes and polytechnics are unable to acquire the relevant practical skills they need to perform well in industry. The result is the low marketability of graduates from the technical and vocational institutes, inadequate entrepreneurial skills and the inability of graduates to set up their own business and the reliance of Government for employment.

5. Recommendation

Stake holders must work to reduce the high rate of unemployment among Ghanaian youths by redirecting the nation's focus on vocational and technical education. The industrial attachments must not only involve students but teaching staff as well. There must be strong structures to ensure that institution and industrial linkages are built around both staff and students. There is also the need for a national governmental policy to incorporate staff industrial internship into faculty development scheme to help foster partnership between TVET training institutions and industry.

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