

# Performance of Higher National Diploma of Building Technology Graduates in the Construction Industry: A Tracer Study in Kumasi Metropolis, Ghana

Awere, E.<sup>1\*</sup> Edu-Buandoh, K. B. M.<sup>1</sup> Dadzie, D. K.<sup>2</sup> Aboagye, J. A.<sup>1</sup>

1. Department of Civil Engineering, Cape Coast Polytechnic, Ghana

2. Department of Building Technology, Cape Coast Polytechnic, Cape Coast, Ghana

## Abstract

Building Technology graduates from Ghanaian Polytechnics seek employment in the construction industry, yet little information is known as to whether their tertiary education is really related to and meeting the actual needs of their prospective employers in the construction industry. The tracer study was conducted to ascertain the performance of Higher National Diploma (HND) Building Technology graduates and the extent to which their academic training meets the employers' needs in the construction industry. In order to obtain a good assessment of the skills (technical and non-technical) and competencies of Polytechnic HND building Technology graduates, purposive sampling technique was used. Construction firms with Ministry of Water Resources, Works and Housing classification of D3K3 and above who have been in operation for a minimum of one year and have employed Polytechnic HND Building Technology graduates were identified. Out of the firms identified, thirty-five (35) were selected using simple random sampling technique. A Structured questionnaire was designed and distributed to site engineers, site supervisors, quantity surveyors, operation managers and project managers in the selected construction firms. Descriptive statistic was used to analyse the data using. The study revealed that Polytechnic HND graduates in the construction industry were performing creditably since the index of performance of site supervisors, quantity surveyors and site managers were generally above average. Apart from the academic competence, graduates possessed non-academic attributes which the employers emphasized as criteria for graduates' employability and performance in the construction industry. These attributes included verbal communication, teamwork, time management, commitment and interpersonal skills.

**Keywords:** Building Technology, Graduates, Polytechnic, Construction Industry, Performance

## INTRODUCTION

The construction sector contributes about 10% of GDP in most developing countries (Ganesan, 2000), capital formation, employment of most countries (Hillebrandt, 2000) and has backward and forward linkage effects with several other sectors of the economy (World Bank, 1984). According to Egmond and Erkelens (2007) one of the key characteristics which has led to the success of many construction firms in Africa, is the practical and technical know-how of its employees.

Polytechnics in Ghana produce mainly middle level technical workforce for the various sectors of the economy. With such a crucial role in the economy, it is expected that Polytechnic Curricula reflect the requirements of industry (Nsiah-Gyabaah, 2007). Technical and vocational education would continue to aim at forming a connecting link, by the acquisition of multiple disciplinary skills between the schools system and the employment market. This link is hard to find in most current Polytechnic programmes in Ghana (Ansah and Ernest, 2013). The separation between theory and practice is becoming increasingly recognised as a potential problem. Academic institutions are criticised for producing graduates with little practical knowledge and interpersonal skills for the industry (Davies *et al.*, 1999). Okorie (2000) observed that the training of technicians in Polytechnics is very theoretical and so polytechnic graduates shy away from taking up employment where they might be called upon to demonstrate their acquired skills. In an attempt to proffer solution to the problem observed above, suggestions were made that if Ghana is to benefit fully from technology; people have to be trained in not only technical skills required on the job but also social skills. Without such training school graduates may find it difficult to secure and maintain job. The resultant effect is unemployment that, according to Igbo (1995), has its own socio-economic consequence. According to Ministry of Employment of Social Welfare (1999) there exist very little research into tertiary graduates' skills and the need of employment.

It is against this background that the study was conducted to assess the extent to which Higher National Diploma Building Technology graduates possess the career growth competencies needed for success in the construction industry. The study focussed specifically on finding out the performance of HND Building Technology graduates in the construction industry and determining the extent to which the academic training of HND graduates in building technology meets the employers' needs in the construction industry of Ghana.

## Employer's Assessment and Perception of Graduates Entrance to the Labour Market

With the increasing unemployment and complexity of construction industry, attaining a good Polytechnic

certificate is no longer a guarantee for employment. Thompson (1993) stated that from the employer’s point of view, job success is dependent not only on the acquisition of specific job skills but also good work attitude. These work attitudes can be referred to as Affective Work Competencies (AWC) or job competencies. Two sets of these characteristic have be identified. One aspect deals with the personal interrelationship involving the workers and the task or specific work function while the other aspect deals with the personal interrelationship between the workers and their fellow workers and managers. Polytechnic education therefore needs to ensure that graduates have a range of skills (technical and non-technical) of potential use to all employers. Davies *et al.* (1999) noted that employers and academics with a connection to professional studies programmes often have competing interests. Employers expect graduates to be immediately effective (instant fee – earners) while academics focus on teaching broad educational aims and higher level intellectual skills.

Aside the qualifications, employers require graduates to possess non-academic skills (attributes) such as good personal and social skills, managerial skills (Akerere and Opatola, 2004; Dabalén *et al.*, 2000; National University Commission, 2004). Boateng and Ofori-Sarpong (2002) in relating these attributes to experience, stress that experience requirements are now stated in terms of competencies and skills rather than years. Although many employers reiterate that the graduates possess a broad and respectable understanding of the cognitive base in technical disciplines, they express dismay in the preparation of graduates in those applied technical skills necessary for solving problems and enhancing business productivity.

### RESEARCH METHODOLOGY

In order to obtain a very good assessment of the skills (technical and non-technical) and competencies of Polytechnic trained building Technology graduates the study employed purposive and simple random sampling techniques. Construction firms with Ministry of Water Resources, Works and Housing of Ghana Classification of D3K3 or higher, registered and operating in the Kumasi Metropolis for more than one year and have employed Polytechnic HND Building Technology graduates were identified. A total of forty (40) construction firms were selected from those who met the criteria. A Structured questionnaire was designed based on information from literature and distributed to site engineers, site supervisors, quantity surveyors, operation managers and project managers in the construction firms. The questionnaire focussed on the performance of their employees and the extent to which their academic training meets the employers’ needs in the construction industry. Out of the forty (40) questionnaires administered, thirty-five (35) were received. The response rate was about eighty-seven percent (87%).

The collected data were analysed using Relative Importance Index. To assist respondents in identifying the level of effect of each variable on the performance of graduates, respondents were asked to rank on a scale of 1 (very poor) to 5 (Very Good) as shown in Table 1 below.

**Table 1: Scale and rank used for Relative Importance Index**

Scale	Interpretation	Rank
1	Very Poor	A
2	Poor	B
3	Average	C
4	Good	D
5	Very Good	E

Using these indices, the rank of each variable was determined. These rankings were used to compare the relative importance of the variables. The equations for computing the weighting score (eqn. 1) and Relative Importance Index (eqn. 2) for each skill / attribute is given below.

$$Y = A + 2B + 3C + 4D + 5E \dots \dots \dots \text{eqn. 1}$$

Where, Y= Weighted score for skill of importance

- A=Number of times a skill was selected as ‘‘Very Poor’’
- B= Number of times a skill was selected as ‘‘Poor’’
- C= Number of times a skill was selected as ‘‘Average’’
- D= Number of times a skill was selected as ‘‘Good’’
- E= Number of times a skill was selected as ‘‘Very Good’’

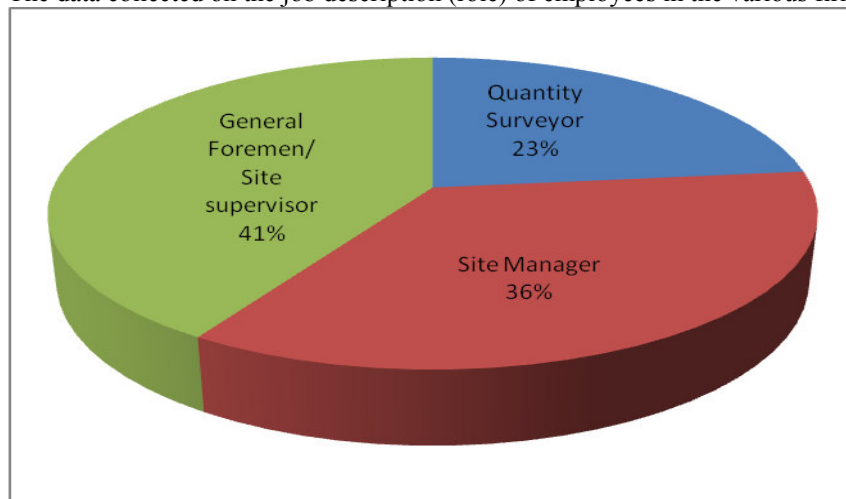
$$P = \frac{Y}{5Q} \dots \dots \dots \text{eqn. 2}$$

Where, P = Relative Importance Index

Q= Number of respondents in a unique category of ranking

## RESULTS AND DISCUSSIONS

The data collected on the job description (role) of employees in the various firms is shown in figure 1 below.



**Figure 1: Job description of Polytechnic HND Building Technology graduates in the various firms in Kumasi**

Figure 1 show polytechnic HND graduates trained in Building Technology are employed as General Foremen, site supervisors and Quantity Surveyors. Majority (41%) of them are employed as Site Supervisors. The roles of general foremen are directly related to the day-to-day supervision of various artisans and activities. Aside their technical competencies, graduates should possess non-academic skills such as analytical skills, good communication skills, good personal and social skills, managerial skills as noted by Akerele and Opatola (2004), Dabalen *et al.* (2001) and National University Commission (2004).

**Table 2: Relative Importance Index and Ranking of Technical competencies for job descriptions performed by HND Building Technology graduates in the Construction industry**

Skills	Total number of Respondents per score					Total	Weight	Relative Importance Index	Ranking
	1	2	3	4	5				
<b>Quantity Surveyors</b>									
Preparing of bill of quantities	0	2	5	15	13	35	144	0.82	2 <sup>nd</sup>
Preparing of site report	0	0	2	10	23	35	161	0.92	1 <sup>st</sup>
Preparing of Contract Documents	5	14	4	8	4	35	87	0.49	4 <sup>th</sup>
Preparing of interim certificate	0	5	6	15	9	35	133	0.76	3 <sup>rd</sup>
Preparing of final account	0	5	6	17	7	35	133	0.76	3 <sup>rd</sup>
<b>Site Managers</b>									
Coordination of site activities	3	4	7	10	11	35	127	0.73	3 <sup>rd</sup>
Man Supervision	4	20	4	5	2	35	86	0.49	6 <sup>th</sup>
Materials Management	0	1	4	5	25	35	156	0.89	2 <sup>nd</sup>
Formation of site safety procedures	4	6	8	9	7	35	111	0.63	5 <sup>th</sup>
Formation of master production schedule	5	5	8	9	8	35	115	0.65	4 <sup>th</sup>
Preparing of site report	0	0	3	8	24	35	161	0.92	1 <sup>st</sup>
<b>Site Supervisors</b>									
Setting out of construction work	0	0	5	9	21	35	156	0.89	1 <sup>st</sup>
Interpretation of building drawing	0	0	7	8	20	35	135	0.87	2 <sup>nd</sup>
Man Supervision	9	15	10	1	0	35	70	0.40	5 <sup>th</sup>
Preparing of site report	3	7	16	9	0	35	101	0.57	4 <sup>th</sup>
Materials management	5	8	9	9	4	35	104	0.59	3 <sup>rd</sup>

Table 2 shows the relative importance index and ranking for competencies exhibited by Polytechnic HND Building Technology graduates in their various job descriptions. The results indicate that the graduates

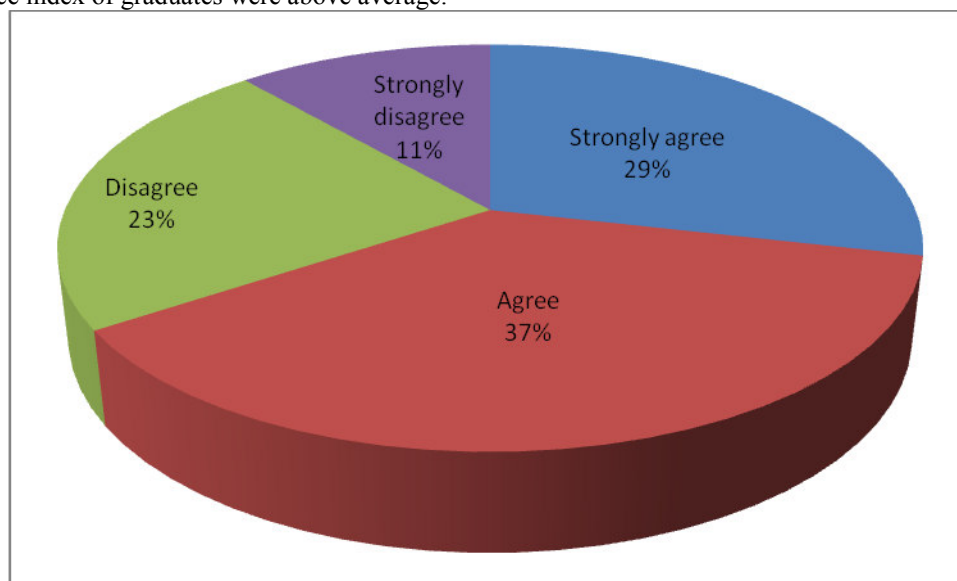
employed as Quantity Surveyors and Site Managers perform better in the preparation of site reports while those employed as Site Supervisors perform better setting out of construction works. The least ranked skills/competencies were preparation of tender documents by Quantity Surveyors and man supervision by site managers and site supervisors. The relative importance index for all the competencies were above average for all the jobs except the least ranked competencies. It can be inferred that the technical performance of Polytechnic HND graduates employed in the construction industry were above average. This confirms that technical competency is the underlying characteristic which results in higher job performance as noted by Edu and Ayang (2011).

**Table 3: Relative Importance Index and ranking of Non-Academic Skills exhibited by Polytechnic trained building technology graduates**

Attributes	Total number of Respondents per score						Weight	Relative Importance Index	Rank
	1	2	3	4	5	Total			
Adaptability	0	3	17	10	5	35	119	0.68	5th
Initiative	6	17	10	2	0	35	78	0.44	13th
Independence	3	15	14	4	0	35	91	0.52	11th
Practical building Knowledge	0	0	8	12	15	35	147	0.84	2nd
Computer Literacy	0	0	4	8	23	35	159	0.9	1st
Commitment	5	3	8	7	13	35	128	0.73	3rd
Self -Management	4	2	12	9	8	35	120	0.68	5th
Technical Literacy	2	6	9	15	3	35	106	0.60	10th
Problem solving skills	4	3	15	8	5	35	112	0.64	8th
Active learning skills	5	0	17	10	3	35	111	0.63	9th
Interpersonal skills	0	0	23	10	2	35	109	0.68	5th
Team work skills	0	0	18	12	5	35	127	0.72	4th
Information handling skills	9	11	8	6	1	35	84	0.48	12th

According to Construction Firms Computer Literacy was ranked highest among the non-academic skills possess by the graduates as shown on Table 3 above. The least ranked skill/attribute was Initiative. With the exception of initiative and Information handling skills, all the other non-academic skills recorded relative importance indexes of above average. This implies that Polytechnic HND building technology graduates possesses other non-academic skills relevant for their employability as indicated by Akerele and Opatola (2004), Dabalén *et al.* (2001) and National University Commission (2004).

Respondents' assessment of whether HND graduates are fully equipped to effectively perform in world of work is shown in figure 2 below. Sixty-six percent (66%) of respondents are of the view that Polytechnic trained building Technology graduates are equipped with the technical and non-technical knowledge and competencies required in the field of work. This is contrary to Okorie (2000) assertion that the training of technicians in Polytechnics is very theoretical and so graduates shy away from taking up employment where they might be called upon to demonstrate their acquired skills. The results obtained were not surprising since the performance index of graduates were above average.



**Figure 2: Graduates preparedness for the field of work after graduation**

The reasons assigned by respondents (34%) for their disagreement that graduates are equipped for the world of work are as follows:

1. The curriculum in the Polytechnic Institutions is more theoretical.
2. Graduates lack in depth technical competence on construction technological discipline.
3. Graduates require further training on site to become competent
4. The graduates are not able to use the techniques and skills construction technological tools necessary for engineering practice.
5. Lack of maturity and organizational working skills.

## CONCLUSION

It can be concluded that Polytechnic HND Building Technology graduates are fully equipped to undertake employment after school and that their competencies (technical and non-technical) meets the average expectation of their employers in the construction industry though they lack some practicalities in their field of study.

The study also revealed that aside their academic qualifications, graduates possess other attributes/skills (non-academic) which the employers emphasized as criteria for graduates' employability and performance in the construction industry. These attributes included verbal and written communication, technical Literacy, teamwork, computer skills, time management, commitment and interpersonal skills.

## REFERENCES

- Akerele, W. O. & Opatola, A. O. (2004). Higher education and the labor market in Nigeria. 67 Nairobi, Kenya: A Final Report Submitted (by NISER) to African Economic Research Consortium.
- Ansah, S. K. & Ernest, K. (2013). Technical and vocational education and training in Ghana: a tool for skill acquisition and industrial development. *Journal of Education and Practice* 4(16): 172-180.
- Boateng, K. & Ofori-Sarpong, E. (2002). An analytical study of the labour market for tertiary graduates in Ghana. Accra, Ghana: World Bank/National Council for Tertiary Education and National Accreditation Board Project Report.
- Dabalana, A., Oni, B. & Adekola, O. A. (2001). Labor market prospects for university graduates in Nigeria. *Higher Education Policy* 14(2): 141-159.
- Davies, H., Csete, J. & Poon, L. (1999). Employers' expectations of the performance of construction graduates. *International Journal of Engineering Education* 15(3): 191-198.
- Edu, D. O. & Ayang, E. E. (2011). Effect of personality traits on career growth competencies of Building Construction graduates of polytechnics in South-East Nigeria. *International Journal of Humanities and Social Sciences* 1(8): 123-129.
- Egmond, E. V. & Erkelens, P. A. (2007). Proposal for a new Btech curriculum in Building Technology at the Cape Coast Polytechnic and Sunyani Politechnic, Ghana. Ghana: Cape Coast and Sunyani Polytechnics.
- Ganesan, S. (2000). *Employment, Technology and Construction Development*. Aldershot, UK.
- Hillebrandt, P. M. (2000). *Economic theory and the construction industry*. Macmillan London.
- Igbo, C. A. (1995). Co-operative work experience plan for senior secondary school: A Framework for providing vocational technical education. Umunze: Research & Publication Unit: Federal College of Education (Tech.), Nigeria.
- Ministry of Employment of Social Welfare (1999). Report on graduates unemployment in Ghana. Ghana: Ministry of Employment and Social Welfare.
- National University Commission (2004). Labour market expectations of Nigerian graduates. Abuja, Nigeria: Education Trust Fund
- Nsiah-Gyabaah, K. (2007). The Change to Competency-Based Education in order to Match Labour Market Needs. *Journal of Polytechnics in Ghana* 2(2).
- Okorie, J. (2000). *Developing Nigeria's workforce*. Calabar: Page Environs Publishers.
- Thompson, J. F. (1993). *Foundations of vocational education: Social and philosophical concepts*. Prentice-Hall Englewood Cliffs, NJ.
- World Bank (1984). *The Construction industry: issues and strategies in developing countries*. World Bank.