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# Human Capital Development in Polytechnics in Ghana: Prospects of Industrial Attachment

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**Abstract**

Industrial attachment in polytechnic education based on the philosophy of experiential education facilitates the production of technically skilled and productive human capital for national development. However, the snag of the programme in human capital development relates to inadequacy of logistics and funding, weak polytechnic-industry linkage, inadequate supervision, and evaluation. The objective of the paper is to assess the prospects of the industrial attachment programme in human capital development in selected public polytechnics in Ghana. The mixed method and explanatory research designs were employed in conducting the study. Sample size of 594 respondents was selected based on the purposive, simple random and systematic sampling techniques. The method of survey via questionnaires, interview guide, and focus group discussions was employed in collecting data, while descriptive and inferential statistics were employed in data processing and analysis. The difference in the prospects based on the benefits of industrial attachment among the stakeholders of polytechnics was significantly small but no significant differences were found among the four polytechnics involved in the study. A strong and effective polytechnic-industry synergy and an industrial attachment fund have the potential of improving and sustaining the prospects of the industrial attachment programme for developing technically skilled middle level manpower for national development.

**Keywords:** Prospects, Human capital development, Industrial attachment, Experiential learning, Polytechnics in Ghana

## 1. Introduction

Development is a process of change in the quality of living (Kendie & Martens, 2008). It is underpinned by improvement in the well-being of people. Over the last two decades, one of the world's development agenda as encapsulated in the Millennium Development Goals (MDGs) is to promote human capital development (UNFPA, 2002). Education with particular reference to technical and vocational education and training (TVET) has been acknowledged as a germane strategy of facilitating social and economic growth and development in Ghana. This is because it constitutes a form of education that imparts industrial knowledge, productive skills and practical experiences that prepares people for specific careers in craft, technician or professional positions in business, engineering, applied arts, applied science, and law among others at various levels.

The essence and educational philosophy of TVET palpably found expression in the recommendations of the University Rationalisation Committee (URC) reports and the educational reforms of Ghana in 1987 and 2007. Indeed, the government's white paper based on the recommendations of the URC report specifically stated that the polytechnics have a distinct and important role to play in middle-level manpower development and that programmes and courses were to be offered at the middle-level of technical training leading to the award of higher national diplomas but not departing from syllabi dedicated to practical training. The provision of such programmes will complete the cycle of technical education and provide a capacity for higher level technician training and practical research (Ministry of Education, 1993). The cumulative and ultimate outcome of the URC report, the educational reforms as well as the enactment and promulgation of the Polytechnic Law of 1992, PNDC Law 321 led to the establishment of polytechnics as tertiary institutions (Government of Ghana [GoG], 1992; Kwami, 2001). The polytechnic law provided polytechnics with autonomy and mandate to provide tertiary education through full time courses in the field of manufacturing, commerce, science, technology, applied social science and applied arts. It was also mandated to offer courses in other areas as may be determined by the authority for the time being responsible for higher education, encourage studies in technical subjects at tertiary level and provide opportunity for development, research and publication of research findings (GoG, 1992). However, the law establishing the polytechnics in Ghana was repealed by the Polytechnic Act, 2007 (Act 754) in order to clarify the objective of polytechnic education in the provision of tertiary education that is career focused and to prepare students for middle-level supervisory and managerial positions in business and industry. These reforms fundamentally brought about significant transformation in polytechnic education in Ghana today.

Polytechnics in Ghana have been described as technologically oriented institutions with the responsibility of contributing actively to national development by providing career-focused education and skills training to the highest level possible and providing opportunities for applied research in close collaboration with

 

business and industry. In this regard the mission of polytechnics in Ghana is ‘‘to provide high calibre career-focused middle-level technical personnel, possessing knowledge-based modern skills for various sectors of the economy. For industry, they are crucial for transforming knowledge and ideas into goods and services through productive progress. They are needed to ensure and sustain efficient productivity in industry” (Kwami, 2001 p.16).

In recent times, the adoption of the educational strategic plan for tertiary education (2010-2020) is meant to provide equitable tertiary education for all eligible candidates, to place emphasis on science and technology and national needs, and to expand tertiary education to include open university and new universities. It is also to strengthen links between tertiary education and industry in order to promote and review academic programmes and research relevant to national development in collaboration with the private sector, and undertake consultation with the private sector particularly industry. This is meant to identify pertinent areas for research and development. The strategic plan also seeks to promote science and technical education at the tertiary level by ensuring that tertiary graduates have appropriate broad skills for future study and work. It is also to update ICT and skills components and making them available and a normal part of tertiary coursework and to national needs (GoG, 2012).

In actual fact, the essence of polytechnic education is to run career-centred and more practically oriented programmes. Hence, most polytechnics in Ghana, train students in at least three of the following faculties, namely applied science, business and management studies, creative or applied arts, engineering, entrepreneurship, and health science. This is to inculcate and develop highly knowledgeable and technically skilled middle-level human capital with productive and employable skills, attitudes, and competencies required in industry and the world of work (GoG, 1992; Kwami, 2001; Amankwah, 2011).

With regard to industrialisation, the key development objectives of the Ghana Industrial Policy (GIP) are to expand productive employment in the manufacturing sector, expand technological capacity in the manufacturing sector, promote agro-based industrial development and promote spatial distribution of industries. However, the challenge of the industrial sector of Ghana relates to the availability of adequate human capital with industrial knowledge, technical skills and practical experience in specialised areas such as oil and gas and manufacture of capital and industrial goods. For instance, with the discovery, exploration and production of oil, the lack of adequately trained manpower in oil and gas production and manufacture of capital goods constraints industrial growth and development of Ghana. The availability of such personnel in these key sectors is an essential pre-requisite for industrial development. Hence, adequate skilled manpower and high labour productivity are critical (Yawson, 2014). With the availability of adequate resources and commitment from stakeholders such as government, polytechnics, industry, and private sector among others, polytechnic education has the potential of significantly providing Ghana with the needed technical human capital for industrial growth and development.

Significantly, for the purposes of realising the whole essence and objective of polytechnic education in human resource development, it is imperative for students and senior members (lecturers and administrative staff) to acquire both theoretical and practical knowledge and technical skills in collaboration with stakeholders in industry and the private sector. Indeed, this can be accomplished through institutional support and collaboration as well as polytechnic-industry linkage. With regard to institutional support and collaboration, a number of key institutions including the Ministry of Education (MoE), National Council for Tertiary Education (NCTE), National Accreditation Board (NAB), National Board for Professional and Technician Examinations (NABPTEX), and Council for Technical Vocational Education and Training (COTVET) have been set up to coordinate the activities of technical institutions including the polytechnics. This is to ensure quality of programmes and award of degrees and diploma certificates to students and to ensure good governance. Similarly, competency-based training and industrial attachment have been introduced and instituted in the polytechnics as a significant step and conduit for enhancing students’ and senior members’ technical knowledge, productive skills, competencies, attitudes and abilities essential for the world of work.

Industrial attachment is a practical skill training enterprise designed to bridge the gap between the theoretical world of academic enterprise and the world of work of professional practice (Lauber, Ruth, Theuri, & Woodlock, 2004). It is a process of anticipatory socialisation where participants engage with industry to observe, learn, experiment and put theory into practice in order to acquire technical knowledge, productive and innovative skills, competencies, attitudes and abilities necessary for the world of work (Adjei, Nyarko, & Nunfam, 2014). The industrial attachment programme based on experiential learning approach has been perceived by stakeholders as a catalyst to human resource development in Ghanaian public polytechnics. It also serves as a perfect transition from the classroom to the world of work by developing students’ job related skills, and enhancing job placement opportunities, as well as developing the problem solving, communication and human relations skills of students (Ayarkwa, Adinyira, & Osei-Asibey, 2012; Adjei, 2013). It also enhances polytechnic-industry relationship, integrates practical experience with theory, builds students’ professional confidence level, and bridges the gap between the classroom and world of work. Similarly, it serves as a source

 

of recruiting and selecting new employees, injecting new ideas into an organisation, and developing industry support for polytechnic programme (Adjei, Nyarko, Nunfam, 2012; Adjei, 2013; Adjei, Nyarko & Nunfam, 2014).

Notwithstanding the significance of the industrial attachment programme in polytechnics in Ghana, empirical studies have shown that the linkage between the polytechnics and industry in the training and education of students and improving the capacity of staff on current innovations in the field of manufacturing, commerce, science, technology, applied arts and applied social science through industrial attachment is weak (Akomaning, 2007; Mensah, 2008; Nkrumah, Apori, & Adjei, 2011; Ayarkwa, et al., 2012; Adjei et al., 2012; Adjei, 2013). The snag is due to the key challenges of polytechnics in human capital development relates to inadequate staff development, inadequate infrastructure, weak financial position of students, inadequate logistics (transport facilities, office equipment, teaching and learning materials, and stationery), unsatisfactory condition of service, inadequate and dwindling funding for laboratories, workshops and industrial attachment supervision, as well as poor Information Communication Technology (ICT) development (Takoradi Polytechnic, 2011; Kumasi Polytechnic, 2012; Tamale Polytechnic, 2012; Accra Polytechnic, 2013). This has resulted in the present challenge of the polytechnics to effectively collaborate with industry and other stakeholders in order to put theoretical lessons into practice in industry, discover new knowledge and innovations through research, produce entrepreneurial, and employable graduates in the areas of manufacturing, commerce, science, technology, applied arts and applied social science. The continued existence of these problems has the potential of hindering the achievement of the objectives of polytechnic education in relation to competency-based training and the industrial attachment programme in particular. Similarly, industry is concerned that polytechnic education seem to lay more emphasis on theory, but less on hands-on practice in human capital development. There are also issues of lack of innovation research and development, lack of correlation between theory and world of work, short duration of industrial attachment, inadequate institutional supervision, and competition between vacation industrial training programme (VITP) and/or industrial attachment programme (IAP) and Ghana National Service Scheme (GNSS) (Yawson, 2014).

In view of the constraints of polytechnics and industries in Ghana, industrial attachment based on experiential learning as an approach to polytechnic-industry collaboration in human capital development is fundamental to polytechnic education, industrial productivity and growth as well as national development. It was therefore imperative to examine the prospects of industrial attachment in human capital development of polytechnics in Ghana. Hence, the objective of the paper is to examine industrial attachment in polytechnic education with regard to its prospects in human capital development in selected public polytechnics in Ghana.

## 2. Literature review

### *2.1. Polytechnic education in Ghana*

Education plays a major role in the social and economic development of Ghana and polytechnic education is no exception. The underpinning for polytechnic education in Ghana can be traced to the early 1950s with the establishment of three Government Technical Institutes, namely, Takoradi Technical Institute, Accra Technical Institute and Kumasi Technical Institute. On the basis of the industrial development policy and rapid technological advancement in a broad range of areas, technical education became very vital for Ghana. Hence, these institutes were upgraded to second cycle institutions in the 1960s and operated under the supervision and administration of the Ghana Education Service for nearly 40 years. During that period, the technical institutes mainly offered craft and technician certificates courses in commercial and technical subjects to satisfy the lower and middle level skilled manpower needs of the country while the universities were offering higher tertiary courses to satisfy the higher level manpower needs of Ghana (Nsiah-Gyabaah, 2005; Accra Polytechnic, 2013; Takoradi Polytechnic, 2011; Kumasi Polytechnic, 2012). In 1963, the three technical institutes were re-designated as polytechnics to run non-tertiary programmes.

In the 1970s, there was the need to restructure Ghana's education to make the curricula reflect the culture and socio-economic and manpower development of the nation. However, the nation could not take bold steps to restructure the polytechnics whilst the traditional universities were busy turning out graduates (Honyenuga, 2001). The inability to restructure the polytechnics left the nation with a necessity for technically skilled middle level manpower. The situation of inadequate technically skilled human capital is still prevalent in Ghana now. Tamale and Ho technical institutes were also elevated to polytechnic status in 1984 and 1986 respectively while the Cape Coast Polytechnic which was planned as a polytechnic was opened in 1986. In 1986, the government under the Economic Recovery Programme (ERP) II initiated discussions on reforms in both the structure and content of education in Ghana. Subsequently, the government constituted the University Rationalisation Committee in 1987 to develop proposals for reforming the management, academic structure and funding of tertiary education including polytechnic education in Ghana. Based on the recommendations of the reports of the URC, the government issued a white paper in 1991 on the reforms to the Tertiary Education System with specific reference to polytechnic education. As part of the educational reforms polytechnics were

 

upgraded and recognised by the passage of the Polytechnic Law 1992 (PNDCL 321) as part of the Ghana Tertiary Education System. These reforms mandated the polytechnics to complement the role of the universities in increasing access to tertiary education by training middle and higher level human resources for the country's development needs. Accordingly, the Sunyani, Koforidua, Wa and Bolgatanga Polytechnics were also established in line with government's policy of making the polytechnics regionally based institutions.

However, the law establishing the polytechnics in Ghana was revoked and replaced by the Polytechnic Act, 2007, (Act 754) in order to clarify the objective of polytechnic education in the provision of tertiary education that is career focused, to prepare students for middle-level supervisory and managerial positions in business and industry in Ghana. The polytechnic law also gave legal backing to desirable transformation in polytechnic management, course structure, grading, certification and staffing. The polytechnics in Ghana now have their own governing boards or councils and the right to design their own curricula, plan their management and development activities.

With regard to the mission, laws and regulations governing polytechnic education in Ghana, almost all of the 10 polytechnics train students in at least three of the following faculties in applied science, business and management studies, creative or applied arts, engineering, entrepreneurship and health science. The polytechnics offer programmes ranging from technician and intermediate certificate courses to diploma, higher national diploma to bachelor of technology certificate courses. There are also plans to offer courses at the level of master degree in the future especially when there are hints to transform the polytechnics into technical oriented universities by the government. This is to inculcate and develop highly knowledgeable and technically skilled middle-level human capital with productive and employable skills, attitudes and competencies required in industry and the world of work (GoG, 1992; Kwami, 2001; Amankwah, 2011).

### *2.2. The concept of industrial attachment*

Internship, popularly referred to as industrial attachment in the polytechnics in Ghana, can be traced to the medical profession in the 1800. By the turn of the century, a few medical schools required student doctors to practise their future profession under the guidance and supervision of qualified physicians (Galbraith, 1991). As the medical schools recognised the value in such experiential learning, other professions, such as public administration, social work, teaching, and engineering among others, adopted internship to prepare adult students for practise in their fields (Alperin, 1981). Today, internship is widely used in many disciplines. Generally, internships are designed to 'bridge the gap' between the theoretical world of academic and 'real world' of professional practise (Macala, 1986; Lauber, Ruh, Theuri, & Woodlock, 2004). Internship experience is one of the most critical components of professional preparation that leads to employment (Parks, 1991; Stock, 2000) and can be the bridge between zero experience and a future career (Stock, 2000).

Practical experience can be acquired in different ways, namely, co-operative education, internship, practicum and work-study. Co-operative education entails experiential programmes, often in technical fields, which alternate academic semesters with work periods; internship is a formal work experience that is directly related to the major and career interests of the students; practicum or field study is generally academically credited experience required by degree programmes for a particular professional training programme such as teacher certification; and work-study is a funded programme in which students work on or off-campus, part-time during an academic year or full-time during the summer (Galbaith, 1991; Jones, 2003). Indeed, there are varied meanings to the concept of industrial attachment. Industrial attachment is a practical skill training enterprise designed to bridge the gap between the theoretical world of academic enterprise and the world of work of professional practise (Lauber et al., 2004).

Internships may be paid or voluntary and may or may not involve academic credits. Stanton and Ali (1987) opined that internships might range from a few months to a year or more, and open to high school students, undergraduates, graduate students and continuing education students. Similarly, Simmons and Haggarty (1980) postulated that, in spite of this diversity; internships have three basic characteristics in common. First, they are short-term; most internships range in length from a few months to a few years. They may extend for an academic year, a semester or summer. Second, internships offer students an opportunity to observe and work in professional work situations, not simulations. Finally, internships represent an 'on-the-job-training' or 'hands-on-learning' experience for the student. Industrial attachment, therefore, is the machinery that helps the polytechnics in Ghana to prosecute their educational objectives efficiently and effectively.

The industrial attachment programme in Ghanaian polytechnics is also designed to help students to carry out a personal assessment in terms of Person-Environment (PE) Fit or Consistency with regard to their chosen careers. Existing theories of career management posit that the attainment of individual success and satisfaction is based on finding a job that is consistent with one's personal characteristics and expectations (Greenhaus, Callanan, & Godshalk, 2002; Feldman, 2002). Studies have revealed that when their work and experiences are in line with their needs, interest, values and life-style preference, people are satisfied with their career choices and jobs

 

(Bretz & Judge, 1994; Ton & Hansen, 2001; Defruyt, 2002). According to Greenhaus et al. (2002), in order for one to achieve a fit or consistency with the work environment, it is necessary to have awareness of one's personal characteristics and expectations as well as an understanding of various work environments.

For college, university and polytechnic students, one of the primary mechanisms for the conduct of self-and environmental-exploration is the completion of temporary 'anticipatory socialisation' work assignments. These assignments, which include internships, co-operative education programmes, practicum, work-study, and experiential learning programmes, are designed to help students develop an accurate self-concept, gain a realistic understanding of various career fields and organisational environments, and allow a check for a fit between individual characteristics and the demands of different jobs.

While the term internship and co-operative education assignment are often seen as interchangeable, there are subtle differences between them (Gault, Redington, & Schlager, 2000). For example, students in co-operative education programmes usually alternate between a period of full-time academic study and a period of paid full-time co-operative employment. Each period, in this regard, must be completed in a six-month block internship assignment and typically involve a specified number of work hours per week (Di Lorenzo-Ass & Mathisen, 1996). The programme can be taken at the students' discretion, but normally, during the junior or senior year of study. In fact, students completing an internship usually receive college credit for their efforts. In Ghana, most polytechnic students receive academic credit for their mandatory industrial attachment programmes. Each period is completed in three months after the first year of study that is at the end of the second semester and three months after the second year course work, which is at the end of the fourth semester, making a total of six months.

*2.3. Human capital development*

The basis of human capital lies in the theories of Schultz (1963; 1981). On the basis of the argument that investing in education improves agricultural output, Schultz explained the linkage between better education and improved productivity as a benefit for the economy as a whole. Consequently, Becker (1964), in building on Schultz's idea of human capital development, indicated that expenditure on education, training and health care are investments in human capital because people cannot be separated from their knowledge, skills, health or values in the way they can be separated from their financial and physical assets.

Human capital refers to the stock of productive skills and technical knowledge embodied in labour which serves as a means of production, into which additional investment yields additional output. The Organisation for Economic Co-operation and Development (OECD) (1998, p.9), refers to human capital as "the knowledge, skills and competencies, and other attributes embodied in individuals that are relevant to economic activity". For Bontis, Dragonetti, Jacobsen, & Roos (1999) human capital represents the human factor in the organisation; the combined intelligence, skills and expertise that gives the organisation its distinctive character. The human elements of the organisation are those that are capable of learning, changing, innovating and providing the creative thrust which if properly motivated can ensure the long-term survival of the organisation. Human capital has also been defined as an intangible asset, best thought of as a stock of embodied and disembodied knowledge, comprising education, information, health, entrepreneurship, and productive and innovative skills, that is formed through investments in schooling, job training, and health, as well as through research and development projects and informal knowledge transfers (Ehrlich & Murphy, 2007, p.2).

The theory of human capital operates on the assumption that formal education is highly instrumental and necessary in improving the production capacity of a population. Hence, it accentuates on how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability which is a product of innate abilities and investment in human beings (Sakamota & Powers, 1995; Psacharopoulos & Woodhall, 1997). The human capital theorists argue that an educated and trained population is a productive population. Therefore, investment in education, training and health of a country could increase its human capital resource base and potential productivity.

Human capital development (HCD) is the process of facilitating improvement in the quality of technical knowledge, productive and innovative skills, competencies, values, attitudes and abilities of people necessary for the world of work. HCD is the process of capacity building and strategic mobilization of human capital which unlocks the door of modernisation, increases productivity and greater global trade as well as integrates them with the world economies (Kazmi, 2007). It involves the process of improving on the knowledge, skills and competencies, and other attributes embodied in individuals that are relevant to economic activity. It also emphasis on the process of improving on the embodied and disembodied knowledge, comprising education, information, health, entrepreneurship, and productive and innovative skills, that is formed through investments in schooling, job training, and health, as well as through research and development projects and informal knowledge transfers (OECD, 1998; OECD, 2001; Ehrlich & Murphy, 2007). Relative to polytechnic education, human capital development connotes improvement in the technical knowledge, productive capacities and innovative skills, values, attitudes, competencies and abilities of students required for the world of work with specific reference to manufacturing, commerce, science, technology, applied social science, and applied arts.

 

### *2.4. Experiential learning theory*

Experiential learning is a "direct encounter with the phenomenon being studied rather than merely thinking about the encounter, or only considering the possibility of doing something about it" (Borzak, 1981, p. 9, cited in Brookfield, 1983; Smith, 2005). Proponents of experiential learning have tended to use the term in two contrasting senses (Brookfield, 1983). On one hand, it is used to describe the sort of learning undertaken by students who are given a chance to acquire and apply knowledge, skills and feelings in an immediate and relevant setting. The second type of experiential learning is "education that occurs as a direct participation in the events of life" (Houle, 1980, p.221; Henderson, Napan, & Monteiro, 2004). Here, learning is not sponsored by some formal educational institution but by people themselves. It is learning that is achieved through reflection upon everyday experience and is the way that most of us do our learning.

According to Jarvis (1995), experiential learning is about learning from the primary experience, that is, learning through sense experience and which tends to exclude the idea of secondary experience. Similarly, Jarvis (1987; 1995) explains experiential learning by recognising a number of responses to the potential learning situation through the trajectory to experiential learning. These include: non learning, non-reflective and reflective learning. The trajectory of non-learning consists of presumption, non-consideration and rejection. The trajectory of non-reflective learning consists of pre-conscious, practice and memorisation while the trajectory of reflective learning consists of contemplation, reflective practice and experiential learning. However, this model has been criticised based on different cultural experience. There is the need to take account of differences in cognitive and communication styles. The model is too simplistic and has no capacity to measure the degree of integration of learning style (Tenant, 1997). This notwithstanding, the model of Jarvis, provides an excellent framework for planning, teaching and learning activities. It can also be employed as a guide to students in acquiring knowledge and skills by observing practical and expert performance in industry (Tenant, 1997).

## 3. Methodology

Mixed method research approach and explanatory research design involving both quantitative and qualitative methods were employed for the purposes of triangulation and complementarity. The study population consisted of third year students and senior members (lecturers and administrative staff) from four selected public polytechnics, namely, Accra Polytechnic, Kumasi Polytechnic, Takoradi Polytechnic and Tamale Polytechnic. Members of industries and professional associations who were beneficiaries of the industrial attachment programme were included.

Purposive, simple random and systematic sampling techniques were adopted in selecting 594 respondents for the study. Purposive sampling was employed in selecting all beneficiary industries of the industrial attachment programme, from records of the industrial liaison officers of the four polytechnic. Consequently, 85 members of industry who worked directly with students on attachment where purposely selected. Four polytechnics (Accra Polytechnic, Kumasi Polytechnic, Takoradi Polytechnic and Tamale Polytechnic) were purposively selected because they were part of the six polytechnics that were first upgraded to tertiary institutions; placed emphasis on practical training through industrial attachment and were located in the metropolis with concentrations of industries (Takoradi Polytechnic, 2011; Kumasi Polytechnic, 2012; Tamale Polytechnic, 2012; Accra Polytechnic, 2013). Hence, 118 senior members who were directly involved in the planning and implementation of the industrial attachment programme were purposively selected. The systematic sampling technique was adopted in selecting 355 students from a total of 6,718 third year students from the four polytechnics based on the sample size determination method of Krejcie and Morgan (1970). Thirty-six members of professional associations involved in the industrial attachment programme of the polytechnics were also purposively sampled. The associations were the Association of Ghana Industries (AGI); Ghana Employers Association (GEA); Ghana Institution of Engineers (GIE); Ghana Institution of Surveyors (GIS); Building Contractors Association (BCA); Road Contractors Association (RCA); Parliamentary Select Committee on Education, and the National Development Planning Commission (NDPC). Others were the Chartered Institute of Marketing (CIM); Institute of Chartered Accountants (ICA); and Chartered Institute of Administrators and Management Consultants (CIAMC) as well as Association of Certified Entrepreneurs (ACE). In all a sample of 594 respondents were selected for the study.

Survey and interviews were adopted as methods of data collection. Instruments such as questionnaire, interview guide, and focus group discussions were used in collecting primary data (Sarantakos, 1998; McBurney & White, 2007). Questionnaires were used for students, senior members, members of industry and professional associations while interview guide was used for key stakeholders (executive officers of industry and professional associations and senior management of the polytechnics). Focus group discussion (FGD) was also held for key stakeholders in the polytechnics and industry.

Descriptive and inferential statistics were employed in analysing both qualitative and quantitative data. Data was processed using Statistical Product and Service Solutions version 16 and presented in tables. ANOVA was employed to determine whether stakeholders significantly differed in their perceptions regarding the industrial

 

attachment and human resource development dimensions at 0.05 significant level and the p-value. The Post Hoc Test was also conducted, using Tukey's Test to determine exactly where the differences among the groups occurred (Pallant, 2005). The results and discussion were presented using the Likert scale, means and percentages.

## 4. Results and discussion

### 4.1 Prospects of the industrial attachment programme in human capital development

#### 4.1.1 *Benefits derived by students from industrial attachment*

Since the establishment of the polytechnics, lecturers and students of various programmes have been undertaking some form of practical industrial attachment. Similarly, industry has been requesting for polytechnic graduates for job placements. The questions to ask are: To what extent have these stakeholders benefited from the industrial attachment exercise? Are there differences in the benefits derived from the exercise? Students form one of the major stakeholders in the current collaboration between polytechnics and industry, especially in the area of industrial attachment. However, the question is: Do students derive any benefit from the industrial attachment programmes instituted by polytechnics as a major component of their studies?

In establishing the benefits derived by students from industrial attachment programmes, the opinions of students were sought on eight statements, namely: Industrial attachment helps to improve an individual's career decision-making; industrial attachment helps polytechnic students to acquire job- related skills; industrial attachment provides opportunity to see and handle new equipment and industrial attachment helps students gain comparative advantage in gaining full-time employment at graduation. Other statements are industrial attachment provides job experiences that are valued by hiring organizations; internship provides polytechnic students with greater self-confidence in securing full-time employment; industrial attachment is a way for students to decide whether a chosen field is really a good fit for a long-term career and industrial attachment gives students the opportunity to put theory into practice.

To the statement that industrial attachment helped to improve an individual's career decision-making, the results of the study revealed that 94.1 percent of the students confirmed the usefulness of industrial attachment in making informed career decisions (Table 1). In this regard, a third year accountancy student of Takoradi Polytechnic indicated that, he was exposed to actual work in industry. This experience broadened his understanding of accounting principles and concepts and how to apply them effectively. It, therefore, helped in shaping his career thoughts as a future accountant.

Another statement in terms of benefits derived by students from industrial attachment was on the acquisition of job-related skills. In this regard, the study revealed that the majority (94.7%) of the students were in agreement with the assertion that industrial attachment programme helped in acquiring job-related skills. In a focus group discussion, a civil engineering student of Takoradi Polytechnic remarked:

> I gained much experience and skills in the use of dumpy level by being able to set the leveling instrument without flaws, take levels for finishing and checks. I also acquired the skill of reading and interpretation of drawings and could therefore read and interpret the bending schedule, setting out, setting of template, concrete mix ratio, grounding, plinths, tower erection, retaining wall and fencing.

Again, respondents' knowledge on whether industrial attachment provided the opportunity for students to see and handle new equipment was obtained. In this regard, most (82.3%) of the respondents indicated that industrial attachment gave them the opportunity to see and handle new equipment. In fact, almost all the discussants in the focus groups attested to the fact that industrial attachment actually provided opportunity to see and handle new equipment.

 

**Table 1: Benefits derived by students from industrial attachment**

| Statement | SA % | A % | U % | D % | SD % |
|---|---|---|---|---|---|
| Industrial attachment helps to improve an individual's career decision-making | 53 | 41.1 | 0.8 | 4.2 | 0.8 |
| Industrial attachment helps polytechnic students to acquire job-related skills | 47.9 | 46.8 | 2.3 | 3.0 | 1.4 |
| Internship provides opportunity to see and handle new equipment | 34.4 | 47.9 | 11.8 | 4.5 | 1.4 |
| Industrial attachment helps students gain comparative advantage in gaining full-time employment at graduation | 22.8 | 47.6 | 12.4 | 14.6 | 2.5 |
| Industrial attachment provides job experiences that are valued by hiring organizations | 25.4 | 53.8 | 13.0 | 6.8 | 1.1 |
| Internship provides polytechnic students with greater self-confidence in securing full-time employment | 26.5 | 49.9 | 12.4 | 9.3 | 2.0 |
| Industrial attachment is a way for students to decide whether a chosen field is really a good fit for a long-term career | 33.5 | 50.7 | 6.2 | 7.0 | 2.5 |
| Industrial attachment gives students the opportunity to put theory into practice | 56.6 | 38.6 | 3.1 | 1.7 | 0.0 |

n=355
Source: Field survey, 2013

In recent times, most organisations require of prospective employees relevant job experience. In this regard, the study also ascertained the reaction of students on whether industrial attachment provided job experiences that were valued by hiring organisations. The majority (79.2%) of the students supported the view that industrial attachment provided the needed work experiences cherished by hiring organizations (Table 1). Like most participants, an accounting student of Accra Polytechnic, in expressing her opinion during a focus group discussion, stated that:

> The industrial attachment training has exposed me to gain a lot of new challenges and experiences and this can usher me into the job market with confidence. My knowledge in financial accounting has been enhanced and broadened. I can now record various transactions and post them to their respective ledgers with no supervision. The issue of tolerance, good communication skills, human relation, prudent time management, reporting to work on time, delivering of work on schedule and application of skills was exercised in order to build and enhance working in the team.

The majority (84.2%) of the students confirmed the assertion that industrial attachment was a way of assisting students to choose a field which would be a good fit for a long-term career in the future. The last perceived benefit which the study sought to ascertain was whether industrial attachment gave students the opportunity to put theory into practice. Clearly, the study revealed that 94.7 percent of the respondents were of the view that attachment truly afforded polytechnic students the opportunity to put the various theories they had learnt in the classroom into practice. In a focus group discussion, an accounting student of Kumasi Polytechnic indicated:

> I have gained basic practical accounting principles such as 'debit the receiver and credit the giver' but I did not know the practicality involved until I undertook this industrial attachment. I have also seen how ledgers and journals are prepared and kept in banks for daily transaction.

#### 4.1.2 *Benefits derived by senior members from industrial attachment*

Like students, senior members (lecturers and administrators) also serve as important stakeholders in the interaction between the polytechnics and industry, and are perceived to derive some benefits from industrial

 

attachment. To this end, the study ascertained whether industrial attachment was important for senior members who taught courses that were vocationally oriented. As indicated in Table 18, the results of the study showed that 89.9 percent of the senior members acknowledged the importance of industrial attachment for senior members, especially those who taught vocational courses.

Also, the study was interested in ascertaining whether senior members derived any benefits from industrial attachment by seizing the opportunity to take advantage of hands-on learning, needed to rekindle their skills and update knowledge. The results of the study indicated that most (94.9%) of the respondents answered in the affirmative (Table 2).

**Table 2: Benefits derived by senior members from industrial attachment**

| Statement | SA % | A % | U % | D % | SD % |
|---|---|---|---|---|---|
| Industrial attachment is important for lecturers who teach courses that are vocationally oriented | 58.5 | 31.4 | 4.2 | 5.1 | 0.8 |
| Attachment programmes provides hands-on learning needed to rekindle skills and update knowledge | 55.1 | 39.8 | 3.5 | 1.7 | 0.0 |
| Industrial attachment provides opportunity to update useful information for class lecturers | 33.1 | 56.8 | 4.2 | 5.9 | 0.0 |
| Internship provides the opportunities for lecturers to change the teaching-learning environment (to kill boredom) | 18.6 | 57.6 | 11.9 | 9.3 | 2.5 |
| Industrial attachment provides professional contacts for networking | 22.9 | 61 | 11.9 | 4.2 | 0.0 |
| Internship helps in expanding research opportunities | 30.6 | 58.5 | 8.5 | 2.5 | 0.0 |
| Internships contribute to curriculum updates | 22.0 | 59.3 | 14.4 | 3.4 | 0.8 |
| Internships (attachment) provide opportunity to learn cutting-edge technology and competition | 30.5 | 56.8 | 11.9 | 0.8 | 0.0 |

n=118

Source: Field survey, 2013

The benefits that senior members derived from industrial attachment were further assessed by ascertaining the view of the respondents as to whether industrial attachment provided opportunity for lecturers to update useful information for lectures. Indeed, the study revealed that the majority (89.9%) of the respondents confirmed the assertion that industrial attachment provided opportunity to update useful information for lectures. To this end, a senior member of Takoradi Polytechnic, in a focus group discussion, commented:

> My extensive experience and familiarity with industrial attachment over the years has contributed to making my lessons with students more exciting and lively because students with industrial training experience confidently contribute and ask questions during lectures. This enhances the process of teaching and learning in the polytechnic.

The majority (83.9%) of the respondents agreed with the statement that the attachment exercise made it possible for the widening of professional contacts and networking, resulting in investing in their social capital. Similarly, the study sought to highlight respondents' opinion on the extent to which internship helped senior members in expanding research opportunities. Whereas most (81.1%) of the respondents affirmed that internship helped in expanding research opportunities, 8.5 percent were undecided and 2.5 percent answered in the negative. The last issue used in ascertaining the benefits senior members derived from industrial attachment was whether internships (attachment) provided any opportunity for senior members to learn cutting-edge technology and competition. The study observed that the majority (89.5%) of the respondents answered in the affirmative (Table 2).

 

4.1.3 *Benefits derived by members of professional associations from industrial attachment*

Professional associations are important stakeholders in polytechnic education. These associations somehow influence the activities of industries and polytechnics and, in return, are perceived to derive some benefits from the practical industrial attachment programme. The responses of members of professional associations on the benefits derived from the industrial attachment programmes are presented in Table 3. With regard to the issue on whether the resources of the polytechnics were readily and easily accessible to host institutions, majority (63.9%) of the professional associations disagreed that host institutions easily had access to the resources of polytechnics.

The assertion as to whether the relationship developed between professional associations and polytechnics via attachment programmes opened communication lines and support system for both parties was also examined. In this regard, the majority (80.6%) of the respondents did not support the assertion that industrial attachment opened communication lines and support system for the associations and polytechnics.

**Table 3: Benefits derived by professional associations from industrial attachment**

| Statement | SA % | A % | U % | D % | SD % |
|---|---|---|---|---|---|
| Resources of the Polytechnic become easily accessible to host institutions | 0.0 | 19.4 | 16.7 | 50 | 13.9 |
| Associations and polytechnic learn of the mission and culture of each other via attachment | 0.0 | 16.7 | 0.0 | 63.9 | 19.4 |
| The relationship developed via attachment opens communication lines and support system for both parties | 8.3 | 11.1 | 0.0 | 61.2 | 19.4 |
| Students interns do fill in when full-time staff are temporarily absent | 2.8 | 8.3 | 0.0 | 88.9 | 0.0 |
| Interns assist professional associations with rush jobs or projects to beat deadlines | 0.0 | 7.8 | 36.1 | 33.3 | 22.8 |
| Professional associations benefit from the knowledge of interns on attachment | 0.0 | 16.7 | 11.1 | 69.4 | 2.8 |
| Attachment programmes help associations in the recruitment of new employees at little or no cost | 2.8 | 13.9 | 0.0 | 77.7 | 5.6 |
| Professional associations get tax rebates for taking on students for industrial attachment | 30.5 | 44.4 | 16.7 | 5.6 | 2.8 |
| Faculty internships (attachment) help to decrease the cost associated with outsourcing research to high-priced consultants | 5.6 | 38.8 | 13.9 | 41.7 | 0.0 |
| Senior members on attachment assist in providing training to the firm's employees | 0.0 | 22.2 | 36.1 | 41.7 | 0.0 |

n=36
Source: Field survey, 2013

The study also, ascertained from members of professional associations the extent to which students interns did fill in when full-time staff were temporarily absent for one reason or the other. The views of most (88.9%) respondents showed that student interns did not take over the responsibilities of full-time staff who were temporarily absent from their job schedules.

Furthermore, the statement as to whether industrial attachment offered members of professional associations the benefit of recruiting interns as new employees with little or no cost was assessed. The study observed that most (83.3%) of the respondents disagreed with the assertion that professional associations recruited new employees at little or no cost via industrial attachment. However, 74.9 percent of the members of the associations acknowledged that the associations enjoyed the benefit of some form of tax rebates for taking on students for industrial attachment (Table 3). This might not be entirely the case as there is no known government policy on offering tax rebates to professional associations and industries that offer students the opportunity for industrial attachment.

 

4.1.4 *Benefits derived by industry from industrial attachment*

Industries in the country are the major partners in the ongoing partnership between the polytechnics and industry. For this reason, the study attempted to ascertain whether industries, which constantly gave audience to polytechnic students, derived any benefits from the interaction. The responses from industry on the benefits derived from the industrial attachment programmes are presented in Table 4.

In the first place, the study assessed whether both industry and the polytechnics learnt of the mission and culture of each other via attachment. The results of the study indicated that the majority (67.6%) of the members of industry answered in the affirmative. In this regard, the Human Resource Manager of Ghana Cement (GHACEM) Limited stated in an interview that:

> Industrial attachment ensured that the end-products from our training institutions, such as the polytechnics and the universities, would be adequately prepared for the job market since they would have acquired the relevant work place culture in order to be competent to explore career opportunities internally and externally.

Again, as to whether the relationship developed via attachment opened communication lines and support system for both parties, the study revealed that 87.2 percent of members of industry were in support of the claim. Thus, the members thought that the relationship between the polytechnics and industry through industrial attachment opened communication lines and support system for both parties (Table 4).

**Table 4: Benefits derived by industry from industrial attachment**

| Statement | SA | A | U | D | SD |
|---|---|---|---|---|---|
| | % | % | % | % | % |
| Resources of the Polytechnic become easily accessible to host industries | 5.9 | 40.0 | 23.5 | 22.4 | 8.2 |
| Both industry and polytechnic learn of the mission and culture of each other via attachment | 9.4 | 68.2 | 10.6 | 10.6 | 1.2 |
| The relationship developed via attachment opens communication lines and support system for both parties | 15.3 | 71.8 | 9.4 | 3.5 | 0.0 |
| Students interns do fill in when full-time staff are temporarily absent | 21.2 | 61.2 | 7.1 | 8.2 | 2.4 |
| Interns assist industry with rush jobs or projects to beat deadlines | 11.8 | 49.4 | 23.5 | 12.9 | 2.4 |
| Industry benefits from the knowledge of interns on attachment | 8.2 | 71.8 | 10.6 | 9.4 | 0.0 |
| Industrial attachment programmes help industry in the recruitment of new employees at little or no cost | 16.5 | 57.6 | 10.6 | 15.3 | 0.0 |
| Industry gets tax rebates for taking on students for industrial attachment | 3.5 | 14.1 | 40.1 | 29.4 | 12.9 |
| Faculty internships (attachment) help to decrease the cost associated with outsourcing research to high-priced consultants | 3.5 | 40.0 | 31.8 | 16.5 | 8.2 |
| Senior members on attachment assist in providing training to the firm's employees | 4.7 | 40.0 | 16.5 | 29.4 | 9.4 |

n=85
Source: Field survey, 2013

Another benefit that the study assessed was whether student interns took over when full-time staff was temporarily absent. Quite significantly, 82.4 percent of the members of industry supported the view that students on internship took over when full-time staff of industries was temporarily absent.

 

Furthermore, the study sought to ascertain whether industry benefited from the knowledge of interns on attachment. It was observed in the study that the majority (80%) agreed with the issue of industry benefiting from the knowledge of interns on attachment (Table 4). On the benefits derived by industry from industrial attachment on the basis of whether industrial attachment programmes helped industry in the recruitment of new employees at little or no cost, the majority (74.1%) of the members of industry agreed with the statement, whilst 10.6 percent and 15.3percent were indifferent or disagreed respectively.

The study employed the one-way between groups ANOVA with post-hoc analysis to ascertain the differences in the benefits derived from the industrial attachment programme across the four stakeholders. The output of the analysis showed the descriptive statistics of the benefits derived from the industrial attachment programme for the four stakeholders. The overall mean score (M=33.58, SD=4.86) and the category of stakeholders' mean score (students [M=33.03, SD=3.98]; senior members [M=33.22, SD=3.81]; industry [M=39.40; SD=3.22] and professional associations [M=26.53, SD=5.42]) represent the numerical average difference of the stakeholders in the benefits derived from industrial attachment at 95 percent confidence interval, and not a consensus rating by the stakeholders (Table 5).

**Table 5: Descriptive statistics of stakeholders on the benefits derived from industrial attachment**

| Respondents | N | M | SD | 95% confidence interval for mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
| | | | | Lower bound | Upper bound | | |
| Students | 355 | 33.03 | 3.977 | .211 | 32.61 | 14 | 33.44 |
| Senior members | 118 | 33.22 | 3.808 | .351 | 32.53 | 22 | 33.91 |
| Industry | 85 | 39.40 | 3.219 | .349 | 38.71 | 29 | 40.09 |
| Professional association | 36 | 26.53 | 5.422 | .904 | 24.69 | 15 | 28.36 |
| Total | 594 | 33.58 | 4.857 | .199 | 33.19 | 14 | 33.98 |

N=Number M=Mean SD=Standard deviation
Source: Field survey, 2013

The mean score does not provide a statistically significant difference on the benefits derived from the industrial attachment programme across the four stakeholders. Hence, the need for ANOVA, which gives both between-groups and within-groups sums of squares, degrees of freedom (df), mean squares, F-value and sig. (ρ-value). The results of the ANOVA revealed that there was a statistically significant difference at the .05 level in the benefits derived from the industrial attachment programme across the four stakeholders. That is, [F (3, 590) =102.51, ρ=.000]. This means that there is a significant difference somewhere among the mean scores on the dependent variable (overall benefits derived from the industrial attachment programme) for the four stakeholders (Table 6).

**Table 6: ANOVA for total benefits derived from industrial attachment across the four stakeholders**

| Source | Sum of squares | Df | Mean square | F | Sig. |
|---|---|---|---|---|---|
| Between groups | 4792.930 | 3 | 1597.643 | 102.509 | .000 |
| Within groups | 9195.362 | 590 | 15.585 | | |
| Total | 13988.291 | 593 | | | |

Source: Field survey, 2013

The resulting statistically significant difference in the mean scores on benefits derived from the industrial attachment programme across the four stakeholders showed there are disparities in benefits derived from the industrial attachment programme across the four stakeholders. However, this does not clearly spell out the differences in benefits of one stakeholder from the other. Accordingly, the post-hoc multiple comparisons, using Tukey HSD test, was used to ascertain the statistical significance of the differences between each pair of stakeholders (Table 7). The results indicated that the benefits derived by students and industry; students and professional associations; senior members and industry; senior members and professional associations; as well as

 

industry and professional associations from the industrial attachment programme were statistically significantly different from one another in Ghanaian Polytechnics.

**Table 7: Dependable variable: Total benefits derived from industrial attachment across the four stakeholders**

Tukey HSD

| (I) Respondents | (J) Respondents | Mean difference (I-J) | Std. error | Sig. | 95% confidence interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower bound | Upper bound |
| Students | Senior members | -.192 | .420 | .968 | -1.27 | .89 |
| | Industry | -6.372* | .477 | .000 | -7.60 | -5.14 |
| | Professional associations | 6.500* | .691 | .000 | 4.72 | 8.28 |
| Senior members | Students | .192 | .420 | .968 | -.89 | 1.27 |
| | Industry | -6.180* | .562 | .000 | -7.63 | -4.73 |
| | Professional associations | 6.693* | .752 | .000 | 4.76 | 8.63 |
| Industry | Students | 6.372* | .477 | .000 | 5.14 | 7.60 |
| | Senior members | 6.180* | .562 | .000 | 4.73 | 7.63 |
| | Professional associations | 12.872* | .785 | .000 | 10.85 | 14.89 |
| Professional Associations | Students | -6.500* | .691 | .000 | -8.28 | -4.72 |
| | Senior members | -6.693* | .752 | .000 | -8.63 | -4.76 |
| | Industry | -12.872* | .785 | .000 | -14.89 | -10.85 |

*The mean difference is significant at the .05 level.
Source: Field survey, 2013

Similarly, the mean scores for each pair of students (M= M=33.03, SD=3.98) and industry (M=39.40; SD=3.22); students (M=33.03, SD=3.98) and professional associations (M=26.53, SD=5.42); senior members (M=33.22, SD=3.81) and members of industry (M=39.40; SD=3.22); senior members (M=33.22, SD=3.81) and members of professional associations (M=26.53, SD=5.42); as well as industry (M=39.40; SD=3.22) and members of professional associations (M=26.53, SD=5.42), were significantly different from each other.

The statistical significance in terms of the actual difference (.03) in the mean scores of the stakeholders was small. The effect size was determined by the criterion classification which states .01 as small effect, .06 as moderate effect and .14 as a large effect (Cohen, 1988). The effect size, using eta squared, is defined by dividing the sum of squares between-groups (15827.266) by total sum of squares (28257.751).

Similarly, the one-way between groups ANOVA, with post-hoc tests, was employed to establish the differences in the benefits derived from the industrial attachment programme across the four polytechnics. The results of the analysis on the descriptive statistics of the polytechnics showed an overall mean score (M=33.58, SD=4.86) and the category of polytechnics' mean score (Accra [M=32.96, SD=5.39]; Kumasi [M=34.09, SD=4.09]; Tamale [M=34.01; SD=4.92] and Takoradi [M=33.29, SD=5.04]). This represents the numerical average difference of the polytechnics in the perception of industrial attachment at 95 percent confidence interval and not a consensus rating by the polytechnics (Table 8).

 

**Table 8: Descriptive statistics on total benefits derived from industrial attachment**

| Respondents | N | M | SD | 95% confidence interval for mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
| | | | | Lower bound | Upper bound | | |
| Accra | 128 | 32.96 | 5.391 | .476 | 32.02 | 20 | 3390 |
| Kumasi | 169 | 34.09 | 4.094 | .315 | 33.47 | 22 | 34.72 |
| Tamale | 113 | 34.01 | 4.916 | .462 | 33.09 | 17 | 34.93 |
| Takoradi | 184 | 33.29 | 5.037 | .371 | 32.56 | 14 | 34.02 |
| Total | 594 | 33.58 | 4.857 | .199 | 33.19 | 14 | 33.98 |

N=Number M=Mean SD=Standard deviation
Source: Field survey, 2013

Nevertheless, the mean score does not provide a statistically significant difference on the benefits of the polytechnics of industrial attachment. Hence, the need for a test of significant difference using ANOVA. The results of the ANOVA specified that there was no statistically significant difference at the $\rho>.05$ level in the scores for the benefits of industrial attachment across the four polytechnics. That is, [$F(3, 590) = 1.85$, $\rho=.137$]. This implies that there is no significant difference in the mean scores on the dependent variable (overall benefits of industrial attachment) for the selected polytechnics (Table 9).

**Table 9: ANOVA for total benefits derived from industrial attachment across the four polytechnics**

| Source | Sum of squares | Df | Mean square | F | Sig. |
|---|---|---|---|---|---|
| Between groups | 130.277 | 3 | 43.426 | 1.849 | .137 |
| Within groups | 13858.015 | 590 | 23.488 | | |
| Total | 13988.291 | 593 | | | |

Source: Field survey, 2013

The outcome of the statistical analysis on benefits derived from industrial attachment is associated with the conclusion that completion of internships and co-operative education assignments improve industrial career decision-making, self-efficacy, and strengthened the crystallization of vocational self-concept and allowed for the acquisition of job relevant skills (Garavan & Murphy, 2001). Similarly, internship has been found to improve students' self-confidence, self-concept and social skills (Gillan, Davie, & Beissel, 1984); increase practical knowledge and skills (Williams, Sternberg, Rashotte, & Wagner, 1993) and enhance employment opportunities (Clark, 1994; Sharma, Mannell, & Rowe, 1995). Taylor (1988) and Brooks et al. (1995) also attest that research assessment of internship and related programmes have expounded over the past several years, reflecting greater interest both in the design of these programmes as well as the consequences for individuals and organizations.

Similarly, a study conducted by Callanan and Benzing (2004) showed that students who completed their internship assignments during their undergraduate years show a significantly higher acceptance rate of career-oriented employment at graduation than those students who have not completed internship. In support of this assertion, results of the statistical analysis of the study conducted by Callanan and Benzing (2004) indicated that the completion of an internship assignment during the undergraduate years is a useful strategy in helping secure a career-oriented position after graduation. The results of the study point to the completion of an internship as the most significant variable in terms of influence on the ability to obtain a career-oriented position. This finding falls in line with those of Callanan and Benzing (2004) who reported that students who accepted a full-time career-oriented position and who have completed an internship, will show a comparatively greater degree of confidence in their 'fit' with their selection than those students who have accepted a full-time position but have not completed an internship.

A close look at the responses of stakeholders indicated that industrial attachment was very beneficial. Results of the interviews conducted also attested to the fact that employers preferred to employ graduates with internship experience as compared to those without any such experience. This is so because new employees with internship experience integrate more quickly and begin work only after a short induction or orientation. Finally, the

 

findings from the focus group discussion established that students of polytechnics considered industrial attachment as an important component of the polytechnic education. One of the cardinal benefits of faculty internship to the institution, as stated by Lantos (1994), is that academic institutions will get what the critics (industry) have been demanding; that is, more practice, up-to-date classroom interaction and more pragmatic applied research.

## 5. Conclusions and recommendations

The significance and prospects of the industrial attachment programme of polytechnics cannot be underestimated in the development of human capital based on the philosophy of experiential learning. Not only has the programme proved to be beneficial in promoting and developing the human capital potentials of students and lecturers, it has the potential of boosting their productive capacities and the employment opportunities of industry. It is noticeable that there is a link between industrial attachment and increased productive capacity and employability of students; as well as improved and sharpened knowledge, skills and productive capacity of senior members and employment opportunities for industry. Accordingly, the study revealed a small significant difference in the benefits derived from industrial attachment among the stakeholders, while no significant differences were found among the polytechnics in the benefits derived from industrial attachment. Indeed, empirical studies have proved that internship has improved student self-confidence, self-concept and improved social skills (Gillan, Davie, & Beissel, 1984; Stock, 2004); increased practical knowledge and skills (Williams, Sternberg, Rashotte, & Wagner, 1993) and enhanced employment opportunities (Clark, 1994; Sharma, Mannell, & Rowe, 1995; Stock, 2004). The prospects of the industrial attachment programme in human capital development, requires a strong polytechnic-industry synergy, the establishment of an industrial attachment fund and tax rebates for industries. This has the potential to support, improve, and sustain the prospects of the practical industrial attachment programme in the development of the needed middle level manpower for national development.

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