

**EFFECTIVENESS OF SUPERVISED INDUSTRIAL ATTACHMENT  
PROGRAMME IN TECHNICAL AND VOCATIONAL EDUCATION TRAINING  
(TVET) INSTITUTIONS IN THE NORTH RIFT REGION, KENYA.**

**BY**

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## DECLARATION

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## **DEDICATION**

This work is dedicated to my family members and many friends. A special feeling of gratitude to my beloved wife Elizabeth, my caring mother Beatrice Angehi, my daughters Charity A., Joy V. and Hope I.. Their words of encouragement gave me strength and resilience to move on. Lastly, I dedicate this thesis to trainers and trainees in TVET institutions.

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## ABSTRACT

There is no training that can prepare individuals for employment for the rest of their lives. Additional and continuous training is needed to make acquired skills more adaptable to the changing work environment. In an effort to bridge theory and practice, Technical and Vocational Education Training (TVET) institutions have incorporated a work-based learning (Industrial attachment program) where students get attached to firms and industries. The expected outcomes include acquisition of conceptual and dispositional occupational knowledge that has a practical orientation and a wide application of generic skills that are vital in the modern workplace. The implementation of this program is however faced with limited attachment places, delayed placement, and low collaborative and linkage programs between training institutions and the industry. This study sought to assess the effectiveness of supervised industrial attachment programme (IAP) within TVET institutions in the North Rift Region, Kenya. The objectives of the study were to establish the influence of IAP on students' problem solving skills, to examine the effect of IAP on students' work ethics and social skills, to assess the effect of IAP on students' ability to exhibit work ethics and culture, to determine the various forms of collaboration between TVET institutions and industry/employers and finally to establish the ratings by students and trainers on the challenges of supervised IAP. The study focused on TVET institutions in the North Rift Region, Kenya. The study adopted descriptive research design. Three TVET institutions were purposively sampled forming the strata of the study. Stratified proportionate sampling was applied to select a sample of 208 students and 29 lecturers. 12 work-based supervisors and 3 Industrial liaison officers were purposively sampled. The research instruments for data collection were; the structured questionnaire and interview schedule. Qualitative data were thematically analyzed and presented as narrations. Descriptive statistics were analyzed through frequencies and percentages. Inferential statistics employed paired sample t-test. The findings show that 87.9% of students attended the IAP program out of which 94.5% were assessed by lecturers. Further, 88% of the lecturers had not received any industrial attachment exposure. IAP significantly contributed to individual student's problem-solving skills ( $t=-10.409$ ,  $p=0.000$ ) but did not contribute to group problem solving skills ( $t= 0.849$ ,  $p= .0137$ ). IAP contributed significantly to students' ability to exhibit appropriate attitude and social skills in responding to constructive criticism and working independently ( $t=-5.143$ ,  $0.00$  and  $t= 5.340$ ,  $p= 0.000$ ) respectively. IAP significantly contributed to student's ability to practice appropriate work ethics and culture in exhibiting team work ( $t= -4.074$ ,  $p= 0.000$ ) but did not significantly contribute to their communication skills ( $t= 0.861$ ,  $p= 0.390$ ). The time it takes for students to find placement places is a significant challenge ( $t= 2.537$ ,  $p = 0.012$ ). The study recommends that lecturers should have regular exposure to the industry in order to update themselves with current trends in the industry. TVET institutions should have a component of training in soft skills entrenched in the curricula and be more strategic in linkage programs with the industry. The study concludes IAP that timely assessment and timely assessment and strong collaborative linkage programs between TVET institutions and the industry can improve the efficiency of industrial attachment program. The study recommends that training institutions need to place emphasis on the acquisition of work ethics and culture including appropriate attitude and social skills that form a critical aspect of the modern workplace requirement.

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**ABBREVIATION AND ACRONYMS**

- EFA : Education for All
- IAP : Industrial Attachment Programme
- IBL : Industrial Based Learning
- IIEP : International Institute for Educational Planning
- ILO : International Labour Office
- ILO : Industrial Liaison Officers
- KESSP: Kenya Education Sector Support Programme
- K.T.T.I: Kaiboi Technical Training Institute
- MDGs : Millennium Development Goals
- NITA : National Industrial Training Authority
- NITC : National Industrial Training Council
- OECD : Organisation for Economic Co-operation and Development
- O.T.T.I: Ol'lessos Technical Training Institute
- R.V.T.T.I: Rift Valley Technical Training Institute
- SDG : Sustainable Development Goals
- STI : Science Technology and Innovation
- TVET : Technical Vocational Education and Training
- UNESCO: United Nations Educational, Scientific and Cultural Organization

## **CHAPTER ONE**

### **INTRODUCTION AND CONTEXUALIZATION OF THE STUDY**

#### **1.0 Overview**

This chapter focused on the following; background of the study, statement of the problem, the purpose of the study, specific objectives, research questions, justification, limitation and assumptions, the scope of the study and the conceptual framework of the study.

#### **1.1 Background of the Study**

Globally, Technical and Vocational Education and Training Institute (TVET) is known to be an education system for confronting economic and development challenges. TVET has been and remains a common development strategy for many countries around the world such as Australia, Germany, China, Taiwan, India, Bangladesh, Ghana, Botswana and South Africa (Alam, 2008). Australia and Germany have used TVET to equip youth with skills and knowledge to address the problem of unemployment (Iacovou and Arnstein, 2007). Countries like Taiwan, China and India have used TVET as a means for supporting creation of skilled work force (UNESCO, 2009) and witnessed an increase in productivity and economic growth. According to UNESCO (2010a), there has been focus on TVET in African countries such as Malawi, Ghana, Zambia, Kenya and Tanzania on entrepreneurship to underscore the role of training for self-employment. This is done to address the challenge of focusing TVET programmes on paid work, while skills can be applied to everyday livelihood to attain income, hence promoting self-development.

In Kenya, Vision 2030 has one of its pillars embedded in Science, Technology and Innovation (STI) in national productive processes central to the success of the

government policies and programmes. A key goal under this thrust is to impart a culture of creativity, innovativeness and continuous learning in Kenya (Kenya vision, 2030). The role of technical training institutions in ensuring that this vision is realized cannot be overemphasized. Kenya has the highest unemployment rate in East Africa at 39%. To mitigate this challenge, the Government seeks to create 1.3 million jobs by 2022 through the manufacturing pillar of the Big 4 Agenda. On the other hand, technical innovations under industry are driving the demand for new skills as more industries shift to automation and artificial intelligence. Manufacturers are now, more than ever, keeping abreast and adopting technical innovations that improve efficiency, in order to remain competitive in the global markets. According to a McKinsey Survey of young people and employers in the European Union, 60% of employees surveyed indicated that new graduates were not adequately prepared for work, adding that there were gaps in technical skills such as Science, Technical, Engineering and Mathematics (STEM) courses and lack of adequate soft skills such as communications, attitude, work ethics were also concerns which Kenyan manufacturers have also raised. The lack of skills needed to drive these innovations is resulting in high labour costs, slow adoption of technology, minimal knowledge transfer, high unemployment levels, particularly for technology-intensive sectors and ultimately threatens the achievement of economic agenda. For Kenya to realize the Big 4 Agenda and other Sustainable Development Goals (SDGs), she has to develop the talent it needs through Technical and Vocational Education and Training. There is need for the county governments in liaison with the national governments to allocate adequate resources for modernizing infrastructure in TVET institutions, as well as the training of TVET instructors to enable them have the necessary skills in teaching,

assessing and have adequate skills in supervising students on Industrial Attachment Placement.

Industrial attachment describes the form of learning whereby students have a chance to acquire and apply knowledge, skills and feelings in an immediate and relevant setting through the engagement of the body and mind through activity, reflection and application which tends to provide depth and meaning to a learning/training system. The term 'industrial attachment' is commonly used in Asian and African TVET systems to describe arrangements allowing practitioners to replenish and update their skills. Industrial attachment has different names. It is called on-the-job learning for teachers and trainers (e.g. Finland), return or back-to-industry programmes (e.g. Australia) and industry placements or secondments (e.g. United Kingdom) (Maclean and Wilson, 2009). Bert, Kaplan, and Soly (2007) consider industrial attachment as a system of training a new generation of practitioners of a trade or profession with on-the-job training.

During the industrial attachment phase, the student is accorded an opportunity to marry theory learnt in the classroom with the real field of work. The relationship between higher education and employment is about the extent to which graduates apply knowledge, skills and attitudes acquired while in a training institution to the world of work. TVET contributes to economic development by providing skills, knowledge, and attitudes needed by high-level professional, technical, and managerial workers (Woodall, 1992). Whalley (1986) indicates that industrial attachment started way back in the middle ages worldwide in form of apprenticeship where training took place under skilled mentorship and was common in all continents across the globe. France, Germany, India, Pakistan, United Kingdom and United states are some of the

countries which developed on job training as from the 9th to the 14th century, with guilds structured around apprentices, journeymen and master craftsmen. Countries like France and Germany have succeeded in turning around their economy through a well-designed vocational/technical education system called the “dual system.” This system created strong linkages between the industry and the training fraternity (Andoh, Boadi, & Minlah, 2016). The success stories of Asian and Pacific countries are attributed to the drastic educational reforms which included the IAP.

Under pre-industrial Europe, exposure to work tasks began at an early age and placement in local work apprenticeships were the dominant forms of preparation for work (Levin, 1987). The tradition continued during the Industrial Revolution (Zeev, Mokyr & van der Beek, 2017) and well into the twentieth century (Cowman, 2014). Today, apprenticeship continues in a more refined manner due to educational advancements and is reflected through cooperation between higher education and world of work leading to internship of students prior to or during the course of study (Teichler, 1997). In a study conducted in Austria, Germany, Italy, Poland, Slovenia and Turkey, students and academics agreed that a practical orientation, cooperation with industry and internship were fundamental tools for enhancing graduates’ employability. Employers concurred and stressed the need to acquire more actual work experience during higher educational studies (Melink & Pavlin, 2012).

In Asia, several tracer studies highlight on the role of Industrial Attachment Placement and Industry Based Learning towards the acquisition of skills for employment. Vong (2014) researched on the Royal University of Phnom Penn and recommended that a short training programme on work skills before undergraduates left the university was necessary to give graduates a big advantage in the job market and to help them understand the labour market needs.



The theme of Industry Based Learning is prevalent, too in inquiries into the relationship between higher education and world of work in Africa. The British Council in 2016 commissioned an investigation on ‘Universities Employability and Inclusive Development’ that covered four countries and several universities in the chosen countries (Ghana, Kenya, Nigeria and South Africa). In Ghana, Kenya, Nigeria and Botswana, the concept of IAP was adopted in efforts to improve the quality of the labour market. They designed an industrial attachment programme aimed at creating opportunities for industrial attachment to continuing students from different institutions of higher learning tailored in a way to improve labour market relevance and exposure. Andoh *et al.* (2016) indicate that in 1992 the Government of Ghana enacted the Polytechnic law which empowered the polytechnic to run Higher National Diploma Programmes to train career or work oriented middle level manpower of higher caliber for employment and industry to enhance national growth. In Rwanda, the Higher Education Council commissioned an alumni survey of higher learning institutions and employers’ satisfaction of graduates’ competences (LG Consult Ltd, 2015) and the proposal was to be achieved in part by enabling students to access placements outside the university to develop life and workplace experience.

In Kenya, the National Industrial Training Authority (NITA), a state corporation established under the Industrial Training (Amendment) Act of 2011 was mandated to promote the highest standards in the quality and efficiency of Industrial Training and ensure an adequate supply of properly trained manpower at all levels in the industry. The history of NITA dates back in 1979 when the Directorate of Industrial Training (D.I.T) was instituted through an act of parliament- The industrial Training Act. It’s widely acceptable that NITA has played a leading role in ensuring that industry and

firms play a mentorship role of training and providing a launching pad for skill development.

Available literature shows that most of Kenya's public universities and TVET institutions have entrenched IAP in their curricular. Differences, however, prevail among institutions and even within departments of an institution in terms of identification of organizations for internships/attachments, students' facilitation, supervision and evaluation. To facilitate implementation of internship policy, the Government of Kenya introduced a monetary incentive to employers. In the 2015/2016 National Budget, a tax rebate was introduced for companies which hired at least ten interns (Republic of Kenya, 2015).

Industrial attachment is not only critical for trainees, it is equally important for teachers, trainers and instructors. During attachment, students are presented with opportunities to expand their competencies in wider areas and increase their knowledge of their study background or discipline and in other fields such as communication. In addition, personal competences or personal attributes improve including problem solving, creativity, time management, loyalty and integrity (Lowden, Hall, Elliot & Lewin, 2011; Sitepu, 2011). Interpersonal competencies such as teamwork, leadership and persistence (which are skills that are in high demand by employers) are also enhanced (Gallup Organization, 2010)

It is also important that students be given the required practical skills which they would require to be self-reliant to cope with emerging challenges of the modern world. Umar and Ma'aji (2010) opine that the current state of facilities in the TVET is inadequate to achieve the goal of skill acquisition for self-reliance and sustainable development hence the need for a viable and well implemented Industrial Attachment

Programme. This further explains why the requirement that Technical and Vocational Education Training (TVET) programmes incorporate a workplace experience (Industrial Attachment Programme) for students before they graduate has received unprecedented emphasis (Bertrand, 2004; NITC, 2004:). Industrial attachment gives students the opportunity to relate theory to practice and prepare them for the world of work and further education (NITA, 2013).

Currently, with knowledge, technology and job characteristics all changing very rapidly, there is today a universal problem of keeping the content of education up to date. Teachers and textbooks, the two major conduits by which the ‘stuff of learning’ gets piped into the classroom, have high rate of obsolescence in this rapidly changing world (Bertrand, 2004). The quality and relevance of any training continues to stimulate passionate discussion among educationists. Educational costs are at the brink of giving birth to diminishing marginal returns as a result of rising unemployment levels among other factors that lead to diminishing social and private returns of education. Amidst all these uncertainties and constraints, the social and private demand to educations continues to rise unabated. “Perhaps a broader and more dynamic solution should be sought on qualitative aspects of educational development, one which views education as a living thing, whose goodness resides not only in its excellence relative to ‘standards’ but in its relevance and fitness to the changing needs of the students, training institutions, employers and the society it is intended to serve” (Beeby, 2007; Finch and Crunkilton, 2007).

Industrial Attachment Programme (IAP), a programme that requires students to be attached in a real work environment in order to get a ‘hands on’ experience, deserves mention if at all training institutions have to be relevant in their endeavour. The

programme requires that students go for attachment for a period of three months in order to acquire relevant skills for their respective trades (NITC, 2004; NITA, 2013). The National Industrial Training Council outlined the objectives of the programme as; students should demonstrate problem solving skills and practical competence in specific situations, should exhibit appropriate attitude and social skills and lastly they should practice appropriate work ethics and culture.

The major aim of the council was to ‘promote the acquisition of practical skills and work ethics among trainees in order to get the greatest improvement in the quality and efficiency of the training of personnel engaged in the industry (NITC, 2004). While these objectives were aimed at achieving such wonderful outcomes from students, little or scanty information exists to show that the programme objectives have been met. As economies are shifting from the traditional factors of production to knowledge based economy, efforts have to be beefed up within the training institutions to ensure that objectives of industrial attachment are realized.

World Bank (2008) noted that “for some time past, an increasing number of countries have realized that there is little point in trying to forecast and plan training requirements without knowing the outcome, that is to say what becomes of the young people who are trained, how they enter the working world, the relationships between the training they have received and the jobs they hold. Emphasis has shifted in assessing the quality of education from a concern with inputs to a concern with outcomes”. With this interest on educational outcomes, a study on IAP in order to assess its success is a worthwhile undertaking. Indeed concerns have been expressed about the growing gap between training programmes and job market requirements (Sessional Paper No. 1 of 2005; Kenya Vision, 2030).

The observation that there is a mismatch between the type of training programmes and the job market requirements has often been fronted by many educationists (UNESCO, 2012; Bray & Varghese, 2010). While solutions are being sought from all dimensions, there is a compounded problem of rapid change in technology that has made it difficult for educational institutions to acquire all necessary machines and equipment required for training. No sooner are these machines bought, than they soon become obsolete because of the same changing technology (Finch and Crunkilton 2007; Billett, 2002 and Dyson 2006). This has caused forecasts concerning the education-employment relationship to be rather abstract, disconnected from the socio economic environment and far removed from the decision making sphere. There is a wide gap between the demand for work experience programmes and the supply capacities of industry; moreover training institutions do not have a well-organized process of assigning industrial attachment to students. In most cases students 'negotiate' their placements individually and the institutions merely approve their application. As a result, some students are not closely monitored or even evaluated (UNESCO – UNEVOC, 2006).

In an effort to conduct a successful industrial attachment, training institutions are however faced with another challenge of having strong collaborative linkage programmes with the industry where students are expected to be attached. Coll, Zegwaard and Hodges (2002) in Billet (2010) observe that the success of industrial attachment depends on the support of the industry which in many cases is often keen after meeting its own goals that are not necessarily academic. Finch and Crunkilton, (2007), and Billett, (2010) have observed that adequate training for occupations is training through occupations. In this respect, care must be taken to ensure that

industries do not play a prohibitive role in an effort of trying to achieve industrial attachment goals.

Against this background, the efforts of training institutions with regard to industrial attachment need to be dynamic and in consonance with technological advancement in the industry. As early as 1908 in Kenya when the colonial government received the Frazer Report and throughout all the recommendations of education commissions that followed, there is no doubt that technical education has received unprecedented emphasis. More so the need for the education system to produce graduates who are self-reliant. The findings of the Ominde Report, 1964, the Ndegwa Commission 1971, the Gachathi Report 1976, the Mackay Report 1984, the Kamunge Report 1988 and the Koech Report 1999 (Mackay, (1981), Kamunge, (1988), Ominde, (1964)) all laid a strong emphasis in technical education which plays a critical role in any vibrant society. A common feature in these recommendations was the need to strengthen the TVET sub sector of education and the teaching of mathematics and science in the school curriculum (TVET Act, 2012). Further, TVET programs need to create the environment where student could relate theory to practice through simulated work environment in training institutions and industrial attachment at real workplace. It is against this background that the study assessed the effectiveness of supervised industrial attachment programme within the Technical and Vocational Education Training (TVET) institutes.

## **1.2 Statement of the Problem**

The modern work environment requires a work force that not only has academic qualification but also has non-academic disposition with an avenue to strengthen and develop generic skills in order to improve employability and work readiness. In order

to realize this goal, training institutions have embraced industrial attachment programs at a workplace that seeks to bridge the gap between theory and practice among trainees. The workplace provides the most authentic learning environment to train a competent workforce (Billett, 1992; Deissinger & Hellwig, 2005; Hager, 2004; Harris & Simons, 1999; Harris, Simons & Clayton, 2005). The workplace also remains the main site for enculturation (Vygotsky, 1978) and the inculcation of trade values (Harris & Simons, 1999). Workplace learning also extends to TVET practitioners who remain the key ‘connective specialists’ (Young & Guile, 1997), linking educational institutions and the workplace. IAP is seen as an effective professional development activity for TVET practitioners to maintain the currency of their vocational knowledge and expertise, including their knowledge of technologies and practices commonly used in contemporary workplaces (Loveder, 2005).

Placement of students on IAP by TVET institutions however faces a hurdle of competing goals with those of host institutions and firms, whose main goal is profit making with some firms having resorted to getting “cheap labour” from trainees. Placement places further provide a myriad of work experiences that goes beyond the expectation of a “practical experience” but rather the possession and acquisition of generic skills whose training is far from the classroom setup and allows a lacuna of exposure and practice in the face of firms/industries with different culture, capacities and goals. Negative organizational culture affects trainees work ethics and culture, including social skills. Additionally, there is a dwindling expectation of employers on trainees/trainees to exercise moral courage in response to the challenging work environment against the set norms and values of organizations.

Studies have shown that institute-industry relationship significantly affects the overall quality of IAP outcomes. There exists limited literature on the role of institute - industry interaction in placement of TVET trainees for IAP. Studies further indicate that the absence of timely placement, timely assessment and appropriate placement significantly affect the quality of IAP outcomes. About 10% of the trainees get attached to centres/firms that do not match their expectations and that some trainees take a long time looking for attachment places. Some hosting organizations are under capacitated and have mentors/workplace supervisors who are unskilled or unqualified to mentor or train. Further, hosting organizations are finding it increasingly difficult to play a mentorship program to trainees from TVET institutions thereby reducing attachment places for the students. Lack of free access to machines and equipment play a significant prohibitive role to experiential learning since the trainers have limited exposure to the industry. Their assessment of students while on IAP against their limited industrial experience places doubt on the validity and reliability of this process. Coupled with high rate of obsolescence of machines and equipment used in training, trainers find themselves at the crossroad whenever they visit firms with high technology and automation level (that they may not have had prior access to before assessment of the students). There is an existing gap between what TVET institutions are producing and what the industry needs. This mismatch has resulted to hosting firms being selective in giving out placement opportunities to students and some students have missed out on placement opportunity altogether.

The increased interest in understanding educational outcomes necessitates this study. An understanding on what becomes of the young people who are trained, how they enter the working world, the relationships between the training they have received and the jobs they hold has received strong emphasis in recent literature (Sessional Paper



No. 1 of 2005; Kenya Vision, 2030). Is the employer-academia conflict or collaboration a panacea to meeting IAP outcomes? To what extent does an IAP develop and sharpen students' skills in problem solving, professional ethics and culture, attitude and social skills in a work place? Do challenges of the IAP pose a threat to attainment of its objectives? This study therefore seeks to establish the effectiveness of IAP thus making it more meaningful and beneficial to TVET practitioners.

### **1.3 Purpose of the Study**

The purpose of this study was to assess the effectiveness of supervised industrial attachment programme within the Technical and Vocational Education Training (TVET) institutions.

#### **1.3.1 Specific Objectives of the study**

The specific objective of the study were to;

- i. Establish the effect of IAP on student's ability to demonstrate problem solving skills
- ii. Evaluate the effect of IAP on students' ability to exhibit appropriate attitude and social skills
- iii. Assess the effect of IAP on student's ability to exhibit work ethics and culture.
- iv. Determine the various forms of collaboration between TVET and industry/employers
- v. Establish the challenges of industrial attachment program

#### **1.4 Research Questions**

- i. What is the role of IAP in enhancing students' problem solving skills?
- ii. What is the effect of IAP on students' ability to exhibit appropriate attitude and social skills?
- iii. What is the role of IAP in enhancing students' ability to exhibit work ethics and social skills?
- iv. What forms of collaboration exists between training institutions and the industry?
- v. What is the rating of students and lecturers on the challenges of supervised industrial attachment programme?

#### **1.5 Justification of the Study**

The attainment Sustainable Development Goals (SDGs), Kenya Vision 2030, Agenda 2063 and Kenya's Big Four Agenda depends largely on the relevance and quality of training and education. On the contrary, there is no training that can fully prepare a person for the rest of his life. The need to continuously update skills and knowledge among employees is becoming a common practice among employers (Martin, 2000; Mann, 2012; ILO, 2006).

The increasing number of students who go for industrial attachment requires that the industrial attachment programme meets its intended goals and objectives. The requirement that students acquire relevant skills and apply theory to practice among TVET graduates continues to elicit passionate concerns and debate among educationists (Hornyak, Green, and Heppard, (2007), Mendenhall (2007)). An effective industrial attachment programme, among other factors, helps bridge the skill gap between what training institutions offer and the expectations of the industry. The

study hopes to increase knowledge and awareness on industry-institute linkage through industrial attachment. The assessment of the effectiveness of industrial attachment programme is critical in determining whether it continues to be a worthwhile venture.

The findings will be useful to educational institution managers, lecturers, workplace supervisors and all other relevant stakeholders for policy formulation and continuous review on industrial attachment programme and policy and that the programme will receive new impetus owing to its role to mould future employees who are students.

## **1.6 Limitation of the Study and Assumptions**

### **1.6.1 Basic Assumptions**

The study was guided by the following basic assumptions

- i. Halo effect error: the tendency to rate a particular statement according to how respondents feel about it in general.
- ii. Central tendency error: the tendency to rate most items in the middle category (when the middle category is offered). Such respondents either dislike extreme positions, or lack knowledge.
- iii. Most students find relevant places of attachment on time and that they got the 'right' placement in line with their course.

### **1.6.2 Limitations of the Study**

The findings of this study have to be seen in light of some limitations; First, there was a challenge of selection bias when selecting student respondents. In one of the institutions, female craft level certificate students did not want to participate in the study. This was however overcome by asking the indulgence of the ILOs to request them to participate in the study and the researcher further made respondents to

understand that the purpose of the study was purely for academic purposes and confidentiality of reporting would be adhered to.

Secondly, the study was faced with the challenge of telescoping where some respondents recalled events that occurred at one time (before the IAP) as if they occurred at another time (after the IAP). This was however overcome by administering the questionnaire immediately after the IAP for respondents to easily discriminate their experiences before and after the IAP.

### **1.7 Scope of the Study**

This study sought to assess the effectiveness of IAP within TVET institutions in the North Rift region of Kenya. The study used descriptive survey design on a sample of selected TVET institutions in the North Rift region. These included; one national polytechnic, four technical training institutes and one institute of technology. The region also has many firms and industries that absorb students for industrial attachment programme. Further, the researcher focussed the study to; to establish the influence of IAP on student problem solving skills, to find out the effect of IAP on students' work ethics and social skills, to establish the various forms of collaboration between TVET and industry/employers and lastly to find out how lecturers and students rate the challenges of supervised IAP.

### **1.8 Conceptual Framework.**

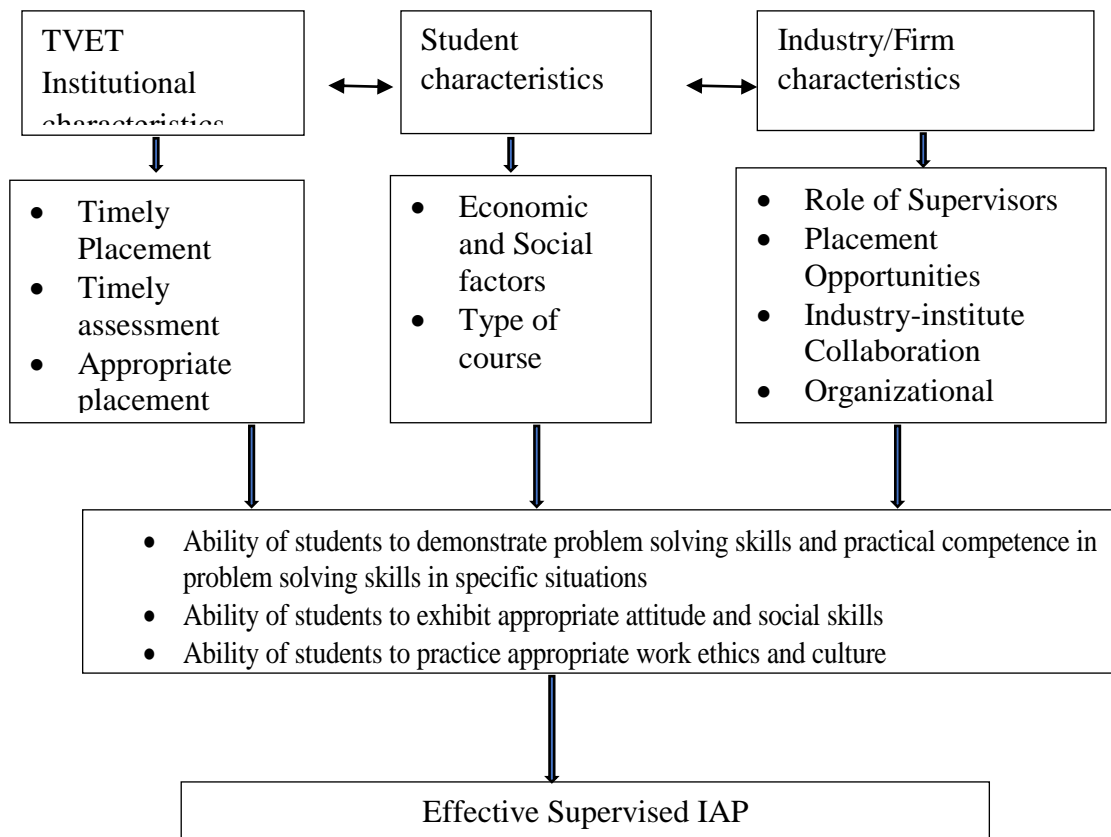
This study adopted a conceptual framework. According to Creswell and Creswell (2018), A theory might appear in a research study as an argument, a discussion, a figure, a rationale, or a conceptual framework, and helps to explain (or predict) phenomena that occur in the world. A conceptual framework refers to the concepts, assumptions, beliefs and experiences that inform a research (Pruzan, 2016) and is not

simply a visual or verbal *presentation* of ideas; it is the *actual* framework of ideas and commitments that inform and guide a study, and may require ongoing reflection for one to understand (Maxwell, 2012). Ravitch and Reggan(2017) clarify that conceptual frameworks seek to identify “presumed relationships” among key factors or constructs to be studied, and that the justification for these presumptions may come from multiple sources such as one’s own prior research or “tentative theories” as well as established theoretical or empirical work found in the research literature.

This study had both independent and dependent variables. Independent variables are those that influence, or affect outcomes in a study (Creswell & Creswell, 2018) while dependent variables are those that depend on the independent variables; they are the outcomes or results of the influence of the independent variables or change as a result of changes in the independent (Creswell & Creswell, 2018; Miller, 1991). The dependent variable in this study was effective supervised IAP as a curriculum implementation. The independent variables were grouped under industry characteristics, institute characteristics, and student characteristics.

An effective Supervised IAP largely depends on institutional characteristics such as timely placement, timely assessment and appropriate placement and industrial visits by TVET managers. Timely placement gives attaches ample time to go through the required contact hours in order to gain the relevant skills at the work place. Delayed placement denies attaches opportunity to learn all that is required to learn and therefore poses a threat to the attainment of the IAP objectives. Timely assessment gives trainers/lecturers an opportunity to evaluate attaches while at the same time connects them to the industry setup. It also depends on student characteristics such as their ability to work as a team, or working independently. This however depends on the ability of TVET institutions to adequately fund these trainers/lecturers to be able

to give a valid and reliable assessment of the trainees while on attachment. Students on attachment tend to be more disciplined and committed to their attachment program when they know that institutional instructors are putting a keen eye on their progress while on IAP. Delayed assessment would pose an opportunity for students to be less committed to the learning process. Appropriate placement plays a critical aspect of ensuring that students relate their disciplines with appropriate learning experience. Industry/firm characteristics such as the role of supervisors, availability of placement places, Industry-institute collaboration and organizational culture determine the outcome of IAP. Effective IAP therefore depends on; ability of students to demonstrate problem solving skills and practical competence in problem solving skills in specific situations, ability of students to exhibit appropriate attitude and social skills and ability of students to practice appropriate work ethics and culture.



**Figure 1.1: Conceptual Model for Effective Supervised Industrial Attachment Programme**

**Source: Researcher, 2020**

## 1.9 Operationalization of Terms

**Apprentice:** Means a person who is bound by a written contract to serve an employer for such period as the Board shall determine with a view to acquiring knowledge, including theory and practice, of a trade in which the employer is reciprocally bound to instruct that person

**Appropriate:** Suitable or proper in the circumstances.

**Assessment:-** Refers to an activity which includes lecturers who are assessors going to placement places to establish whether students are doing the required tasks while on attachment.

**Attachees:** Refers to students on IAP.

**Collaboration:** Refers to a programme where training institutions work jointly with other institutions and industry/firms or together especially in an intellectual endeavour.

**Competence:** The ability to do something successfully or efficiently

**Conceptual Framework:** - A conceptual framework represents the researcher's synthesis of literature on how to explain a phenomenon. It maps out the actions required in the course of the study given his previous knowledge of other researchers' point of view and his observations on the subject of research, (Regoniel, 2015). As McGaghie *et al* (2001) put it, it sets the stage for the presentation of the particular research question that drives the investigation being reported based on the statement of the problem (Regoniel, 2015).

**Effectiveness:** an activity that involves timely placement of students, timely assessment by institutional assessors and appropriate placement by ILO's



**IAP period:** Refers to a three month period within which students are expected to be exposed to real work experience for learning purposes.

**Industrial Attachment Programme:** Refers to a vital component of training intended to provide trainees with an opportunity to acquire and sharpen knowledge, skills and attitudes from real work experience. The programme usually lasts 3 months and serves to expose students to the world of work' where students are given opportunity to look beyond the classroom and the laboratory.

**Industrial attachment:** Means the placement of a student in a workplace for the purpose of gaining knowledge and practical skills; "industrial training" means training for a specified industry.

**Industry/firm:** Refers to enterprises in the sector of the economy that provide opportunity for employment.

**Industry:** means a trade, occupation, profession or an economic sector for which a training committee has been established for purposes of this Act;

**North Rift Region:** - Refers to that entire region comprising of Nandi County, Keiyo County, Trans Nzoia County, Baringo County, Nakuru County, and Uasin Gishu County in the Republic of Kenya.

**Partnership:** Refers to all types of strategic collaboration between the industry and training institutions in the field of training

**Placement places:** - Refers to organizations where students are attached

**Placement:** Refers to an act of identifying places of attachment and sending individual students to appropriate places. It is done prior to commencement of the IAP

**Problem Solving:** the process of finding solutions to difficult or complex issues

**Skill acquisition:** Refers to competencies gained by students while on IAP such as team work or communication skills.

**Supervision:** Refers to an activity which involves workplace supervisors ensuring that students on attachment perform their daily tasks in line with the objectives of the IAP and according to the supervisor's prescription

**Timely:** This means doing something or accessing something at the appropriate moment.

**Workplace supervisors:** Refers to individuals who have the responsibility of mentoring students on attachment over what they are expected to do.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter highlights the relevant literature review of the study. The chapter is organized according to the research objectives and the following themes were derived from them; the role of Technical and Vocational Education and Training (TVET), Industrial Attachment Programme, Objectives of Industrial Attachment Programme, Problem solving skills and IAP, Professional attitude and social skill and IAP, work ethics and culture and IAP, collaboration of TVET institutions and the industry, challenges of IAP and finally a summary of the literature review.

#### **2.2 Role of Technical and Vocational Education and Training (TVET)**

Globally, Technical and Vocational Education and Training (TVET) play a critical role in the national development of every country. One of the most important features of TVET is its orientation towards the world of work and the emphasis of the curriculum on the acquisition of employable skills (UNESCO, 2015). TVET serves as an important enabler for governments in attaining Education for All (EFA), a global commitment geared towards ensuring that all children and youth have access to quality education. TVET also includes a wide range of skills development opportunities attuned to national and local contexts. According to UNESCO, (2015) learning to learn, the development of literacy and numeracy skills, transversal skills, and citizenship skills are integral components of TVET. Additionally, TVET institutions are central in providing the necessary education and knowledge for social equity, inclusion, and the successful implementation of SDGs (ISCED, 2012,). Therefore, effective implementation of TVET programs like industrial attachment cannot be underestimated.

Technical and Vocational Education and Training (TVET) is defined by UNESCO/UNEVOC as an education that is designed to lead to the acquisition of practical skills, knowledge, attitude, and understanding, relating to trades in various sectors of economic and social life (UNESCO, 2010). According to Hick *et al.* (2013), TVET is an education process that involves the study of technologies and related sciences by which one acquires practical skills and knowledge. TVET as an education system is an asset for confronting economic and development challenges (Quisumbing, 2001).

In many different countries technical and vocational education has been given different names according to various geographical locations: Vocational Education and Training (VET), Technical and Vocational Training (TVE), Technical and Vocational Education Training (TVET), Vocational Training Education (VTE), or Vocational and Technical Education and Training (VOTEC). These terms are used by various geographic locations (McGrath, 2012). Historically, the term “TVET” was adopted at the 30th session of the General Conference of UNESCO in Paris during the second international congress on technical and vocational education in Seoul *UNESCO-UNEVOC (2017)*. The definition of the term TVET agreed upon was 'to be the process of combining education and training in a way that acknowledges the common objective for employment as the primary goal'. It was also agreed that the programs in TVET should be comprehensive and inclusive, accommodating, and gender-balanced (Hiebert & Borgen, 2002).

TVET in most Developing Countries is expected to play two crucial roles in the national sustainable development (social, economic & environmental development). The first role is to provide training opportunities and career advancement avenues for

the increased school leavers. The second role is to provide skilled manpower that is needed at all levels of the economy. The skills so developed should be able to lead to self-reliance in the absence of salaried employment and enhance the industrialization process. According to Bagale, (2018), TVET contributes to generating gainful employment, encouraging self-employment and entrepreneurship development, leading to better earning which ultimately helps them to uplift living standards. Further, Bagale (2018) opines that the main essence of TVET is the overall development of the nation with the well-equipped and advanced technology for mainstreaming the development of a nation to develop a high level skillful human resource that is needed.

Throughout the world, and particularly countries in sub-Saharan Africa, Kenya included, renewed efforts have been made to promote TVET for skill formation that would enhance productivity and sustainable global competitiveness (Dasmani, 2011). The increasing importance that African countries now attach to TVET is reflected in the various poverty reduction strategies that governments have developed in collaboration with the World Bank. According to the African Union (2007), the most important feature of TVET is its orientation towards the world of work and the emphasis of the curriculum on employability skills. TVET programs are well placed to train the skilled and entrepreneurial workforce for the economy. According to Ezeji, Ugwoke, Edeh, and Okanazu (2015), TVET programs such as Business Education are aimed at empowering graduates with desired skills, knowledge, and values for self-employment or paid employment. The consensus among scholars and professionals is that TVET is apt for the economic and technological advancement of developing nations of the world including Kenya (World Bank, 2008; Desmart-Digbori, 2011; and Dangote, 2013). Despite the critical role of TVET, several issues

like ineffective industrial attachment challenges may hinder TVET from accomplishing its mandate. Siroh, (2011) argues that educational institutions are faced with several challenges, ranging from low employability of the workforce, access to formal and non-formal TVET quality of skill development, relevance of curriculum and skills, structural linkage labor market information, lack of mobility and skill development for the organized sector and lack of industry –institutional linkage. There is, therefore, a need to assess the effectiveness of IAP to establish whether the trainee is to develop awareness on the requirements of the world of work, enhance already acquired work-related skills which include social skills, have a hands-on experience with modern technology in whichever workplace a trainee serves, as well as, make a personal connection between theory and practice.

### **2.2.1 Technical, Vocational, and Education Training in Kenya**

In Kenya, there is a vast network of TVET institutions providing a wide range of programs ranging from artisan, craft certificate, and diploma levels. Further, there is a marked expansion in enrolment and number of TVET institutions in Kenya. Despite this, TVET institutions have some marked shortcomings in terms of low allocation of funds in the national budget, understaffing in technical subjects due to poor remuneration of staff, and use of obsolete equipment and insufficient learning materials (Nyerere, 2009). TVET policy by the Republic of Kenya (2012) also indicates that the curriculum being offered in TVET institutions is majorly theory-based and not relevant to market needs due to limited links between the institutions and the industries hence there is a mismatch of skills taught in the institution and those required by employers.

TVET has been acknowledged as a veritable strategy of facilitating socio-economic growth and development in Kenya. Kenya recognizes the role of education and training in contributing to the Gross Domestic Product (GDP) with particular emphasis on TVET (the Republic of Kenya, 2003). The subsector has been identified as one that will be able to spur economic development within the next 11 years and help achieve Vision 2030.

Recently, Kenya revitalized the subsector to locate herself strategically in the international scene (the Republic of Kenya, 2012). The TVET sector in Kenya has experienced moderate growth over the last 40 years. The sector continues to produce the needed middle-level human resource for the national economy. The Vision 2030 has however placed special demands on TVET as the leading engine that the economy must essentially rely upon to produce adequate levels of the middle-level manpower needed to drive the economy towards the attainment of the vision. Moreover, the Constitution of Kenya 2010 has also created demands that require the technical and vocational education and training sector to develop policies and strategies to facilitate faster economic growth.

### **2.3 Industrial Attachment Programme**

The current competitive economic environment places a demand for graduates to know the academic content, as well as a range of portable skills that harness growing knowledge, technology, and engineering advances (Liyanage and Poon, 2003). Mohammad *et al.* (2004) argue that current economic challenges and globalization are forcing employers in the engineering sector to seek competent engineers. Thus, students have to equip themselves with skills desired by their future employers. Beyond good academic qualifications, employers also require new trainees to be

equipped with relevant capabilities, skills, abilities, and personal qualities (Azami *et al.*, 2009).

Employers require that entry-level graduates should be able to read, write, and compute; communicate clearly and effectively; have solid work ethics; be technologically literate; and be able to work in teams, make decisions, solve problems, and manage their work (ILO, 2013). In this light, the study will highlight the importance of doing an overhaul in education not only its content and delivery modes but also the way it is used to promote the knowledge management process in organizations. This can be achieved through industrial attachment.

Globally, industry-based work placements have been reported to be a critical conduit to graduate work readiness (Von Treuer *et al.*, (2011). The term placement has been described variously as; on-the-job learning for teachers and trainers, return or back-to-industry programs, and industry placements or secondments (Maclean and Wilson, 2009). It is also referred to as internships (Gibson *et.al*, 2010), work placement, (Colacetto *et al*, 2011), fieldwork (Hay and O'Donoghue, 2009), industry-based learning (Gibson *et al.*, 2010), sandwich years (Bullock, 2009), apprenticeship (Gibson *et al.*, 2010), cooperative education (Reeders, 2000), practicum (Reeders, 2000) and Service-learning (Clinton and Thomas, 2011).

This study will adopt industry-based learning to mean Industrial Attachment Programme (IAP). IAP is a 'vital component of training intended to provide trainees with an opportunity to acquire and sharpen knowledge, skills, and attitudes from real work experience' (NITA, 2013; Sweet *et al.*, 2010). The program includes activities agreed upon by the supervisor, trainer and the attaches to be followed for the duration of the attachment period. These activities include, but are not limited to, job rotation,



task variety, mentoring, and supervision by experts (Sweet *et al.*, 2010). The program usually lasts 3 months and serves to expose students to the world of work where students are given the opportunity to look beyond the classroom and the laboratory and see how science is put into work to serve mankind (NITC, 2004).

Given that the practical aspects of training are limited by the chronic lack of the more modern and expensive laboratory equipment's and other infrastructure, students use the opportunity to discover how some of the theoretical principles they have learned are applied in the various industrial processes (Bertrand, 2004, UNESCO, 2007). Students are also exposed to non-science factors such as the economics of the operations as well as the safety and industrial -labour legislation that applies to the workplace (UNESCO, 2007). Verner (2004) adds that the importance of appropriate organizations to place students need to be overemphasized. IAP in TVET institution is usually assessed based on four criteria. These are;

- 1) A logbook is prepared according to specifications provided by training institutions. The logbook assists in keeping accurate records of practical experiences. It is designed to enable students to write down their daily activities including sketches and diagrams. Students are required to submit the logbooks to their supervisors for their comments at the end of the attachment period.
- 2) A final report was prepared by the students on their experience during the attachment program.
- 3) An evaluation by the training officer/workplace supervisor where the student was attached.
- 4) Periodic visits and assessment by trainers of training institutions.

Few would argue that only the college or school-based components of IAP/apprenticeships generate the knowledge required for skilled work, or that work settings are merely sites to apply and practice what has been learned in educational settings. There is growing evidence of the potency of practice-based experiences for learning occupational capacities across the range of kinds and categories of work (Billet 2010; Cooke, Irby and O'Brien, 2010). Learning through practice is probably still the preeminent form of the initial and ongoing development of individuals' skills across a range of nations and cultures (Billet, 2010). This is the reason why Roegge *et al* (2008) contend that TVET programs should contain a work experience component. This is attributed to the fact that "technologies keep on changing almost daily making it difficult for educational institutions to acquire all the necessary machinery and equipment required for the training of their students". It will be perhaps worthwhile to note that 'nowadays no training can prepare a person for employment for the rest of his life. Additional and continuous training is needed to make employment more adaptable to the changing work environment (Atchoarena & Delluc, (2009), Butterwick & Benjamin, (2006); Gamble, (2002); Bertrand, (2004).

The continuous updating of skills by employees or students can only be done through an education system that is responsive to changes in technology. Evidence suggests that authentic occupational skill growth generates both situation-specific and more broadly applicable occupational knowledge (Billet, 2004). Through engaging in work activities, individuals can secure the conceptual, procedural, and dispositional occupational knowledge required for their work, including capacities that are adaptable to other circumstances where that occupation is practiced (Billet, 2010, 2015; Groenewald, 2004).

Inevitably, the accelerating technical progress has made it practically impossible for training institutions to have access to modern equipment and machinery working under real production conditions because such equipment is costly and soon becomes obsolescent (Bertrand, 2004; Finch & Crunkilton, 2007). The implication of this is that strong institutional programs have to be put in place to ensure that the relationship between training institutions and the industry remains vibrant. This is because learning depends on the type of environment. It suffices to say that 'rich' learning does not necessarily come from a work-based experience. Holbrook & Chen, (2017) argue that rich or adaptable learning arises as much from experiences in practice settings as from those in the educational setting. The emphasis therefore should be on the kind of activity and interaction that these learning settings afford, and how individual students engage in them. It is this that shapes what is learned and not what the location is labeled; whether school, workplace, home, college, or university (Billet, 2010).

It is believed that the success of an industrial attachment program depends firstly on precisely what one wants to know and the financial resources available. Davies, (2011) however asserts that people do not necessarily learn from experience nor does basic education equip youth with skills and knowledge for the world of work. There exists a difference between experience and experiential learning. Generally, learning is primarily an activity that arises from the personal experience of grappling with a problem, therefore the incorporation of students' experience and learning outside of the classroom is a powerful way to motivate them and to engage them in learning.

The increasing reforms and adoption of the industrial attachment program world over become a clear indication of benefits experienced by the training institutions,

students, host organizations, and the industry at large. It, therefore, becomes an inevitable practice by different countries for the creation of a sustainable human resource to increase industrial productivity. Attachment creates a platform for students to assimilate theory into practice. Gill and Lashine (2003) rightfully put it across by pointing out that the whole essence of learning is to put into practice the learned theories. The study by Edziwa and Chivheya (2015) was relevant in this study since it also supported the idea of practice based learning by indicating that industrial attachment exposes students to the real world of work where they put into practice the theory and technical skills learned in the lecture room. This in turn inculcates a positive attitude towards work (Williams, 2008). The exposure of students to the working environment raises their employment opportunities against the dwindling employment opportunities.

Edziwa and Chivheya (2015) indicate that industrial attachment enhances professional practice as the student would be better able to go out and contribute meaningfully in society and at the workplace. The student directly encounters the phenomena studied as opposed to visualizing. This accords the learner room to construct knowledge, skills, and values from direct experience. Attachment enhances cross-training which allows students to experience and practice different work-related skills. Provision of attachment allow trainees to update their skills and knowledge in their trades, exposes them to new methods and materials, gives them a realistic and holistic impression of their trades, and brings elements of realism into their training.

### **2.3.1 Objectives of Industrial Attachment Programme**

The role of education to develop the individual's personality and enable him or her to fit into society has received increasing attention in recent years. Equally, criticism has

been widely expressed by the general public, the media, employers, and parents about the quality of technical education; its ability to produce relevant, competent, and qualified graduates; these border on occupational training, and thus TVET institutions have been on the spotlight on how they conduct IAP.

Today, with knowledge, technology, and job characteristics all changing very rapidly, there is a universal problem of keeping the content of education up to date. Teachers and textbooks, the major conduits by which the 'stuff of learning' gets piped into the classroom, have a high rate of obsolescence in this rapidly changing world (UNESCO, 2007). More so, the rapid increase in enrolments at all levels in education without a commensurate increase in infrastructure and personnel have led to overstretched facilities and high student-staff ratios (Kenya Vision 2030, National Report for Kenya 2008).

Consequently, training especially in the TVET sub-sector of education has been hindered by inadequate facilities and inappropriate curricula hence most graduates lack appropriate skills. Further, the mismatch between skills and job requirement places a sharp demand on the education system to improve student's opportunities to participate in the development process and for globalization ((Berzin, 2010). "Perhaps the best solution is to find a broader and more dynamic conception of the qualitative aspects of educational development-one which views education as a living thing whose goodness resides not only in its excellence relative to certain 'standards' but in its relevance and fitness to the changing needs of the particular students, employee or the society is intended to serve" (Beefy, 2007).

The only adequate training for occupations is training through occupations. Finch and Crunkilton (2007) acknowledge that it is difficult for individuals and institutions to

get all the highly specialized equipment needed to operate quality programs in colleges. It follows that while some skills could be obtained in the classroom, others are best developed in the workplace (Billet 2011a; Clinton and Thomas 2011). To bridge the gap between training and the job requirements, the Kenyan government through the National Skills Training Strategy developed a manual through the National Industrial Training Council. It aimed to ensure that students in training institutions become more relevant in workplaces in order to witness improvement in the quality and efficiency of the personnel engaged in the industry (NITC, 2004). The then Director of Industrial Training acknowledged the 'efforts being made by training institutions to attach trainees. He further noted that industrial attachment targets to influence the quality and efficiency of training to secure an adequate supply of well-equipped manpower with problem-solving skills as well as appropriate work ethics.

The Council in 2004 outlined the general objectives of an Industrial Attachment Programme to include among others; to improve labour market relevance among trainees, to link in-school training with on-the-job training and finally to promote the acquisition of practical skills and work ethics of attaches (NITC, 2004). The specific objectives were to ensure that attachés demonstrate problem-solving skills, demonstrate practical competence and problem-solving skills in specific situations, exhibit appropriate attitude and social skills including appropriate work ethics and culture (NITC, 2004).

Problem-solving refers to the ability to use knowledge, facts, and data to effectively solve problems. This is because employers want employees who can work through problems on their own or as an effective member of a team. Potential future employees are expected to think critically and creatively, share thoughts and opinions,

use good judgment, and make decisions and besides, the students are expected to possess transferable skills (Blume *et al.* 2010). The transferability of skills involves students and practitioners being 'able to explain in a coherent, comprehensive and convincing manner how their practices informed by their knowledge base, and being able to apply their knowledge and learning to new situations through appraising what is general and what is particular in each situation' (Jackling & De Lange, 2009; Lees, 2002 and Mann, 2012).

Ayarkwa, Adinyira & Osei-Asibey 2012; Adjei, 2013 are quick to caution that transferability of skills requires an understanding of theories of human behaviour. This can enhance a perfect transition from the classroom setup to the world of work by developing students' job-related skills.

### **2.3.2 Outcomes of Industrial Attachment Programme**

World Bank (2007) notes that, for some time past, an increasing number of countries have realized that there is little point in trying to forecast and plan training requirements without knowing the outcome, that is to say, what comes of the young people who are trained, how they enter the working world, the relationship between the training they have received and the job they hold. Emphasis has shifted in assessing the quality of education from a concern with inputs to a concern with outcomes'. There is a need for education systems to address the issue of employability and relevance of its graduates and much more so their adaptability to the world of work. The parameters used for the measurement of outcomes of an Industrial Attachment Programme require that one quantifies them. However, this is quite a challenging task. "While it is easy to qualify any input in terms of materials, cash and labour it becomes problematic when we try to quantify output or outcomes, whether

we should look at it as the people or students who have gone through the education system or the skills that they have acquired or go even further, the use to which they put them".

The measurement of output may also be basic if productivity can be measured in terms of the level of skills attained on the level of education qualification since the two do not necessarily imply the same. Indeed there are complexities in measuring the results of training.

Beyond the need for reliability and validity, the complex nature of student evaluation in the field setting also makes it challenging for assessment to find an appropriate measure as they continue to strive to attain IAP objectives (Holden, Anastas, & Meenaghan, 2017). For example, the factors involved in measuring student competency within the practical setting include the practical setting, the student, and the trainer (McCarthy, 2006). Due to the complexity, field instructors often default to measuring students on their personal qualities, including personality traits and learning style, instead of core educational competencies (Bogo *et al.*, 2006). Consequently, the field instructor's opinion of the student's personality traits and fit within the field practicum setting often take precedence over observation of the student's application of work skills and competency (Bogo *et al.*, 2006).

IAP is faced with competing interests from the firms/industry. This is so because while training institutions aim at meeting these objectives, they have to keep a keen eye on the developments in the industry. The dilemma is that 'nowadays employers are interested less in technical knowledge and know-how than in behaviour related skills among employees. The argument is that employees should have the ability to analyze, to engage in national discussions, to show evidence of creativity,



adaptability, autonomy, a sense of responsibility, and to work as a team. These elements are given prominence in the workplace by forward looking human resource managers (Bertrand, 2004). These skills are hard to compute and whatever methods that may be applied will prove to be a daunting task. Further, an evaluation of abilities is not necessarily knowledge and know-how.

The success of IAP is further dependent on the goal of the specific firm/industry in which students are attached. Some firms place a strong emphasis on strong technical knowledge (hands-on skills) with little emphasis on the theoretical knowledge of the processes. Others place a strong emphasis on the skill of the employer with little theoretical grounding. Faced with such scenarios, students attached in such firms ultimately come out with different outcomes. Mann (2012) observed that students on attachment, upon completion of IAP related theory to work and some felt that they needed to change their course when they report back to college.

Labour processes change and continuous redefinition of job requirements has attracted broad based training that focuses on transversal skills and broadly applicable theoretical knowledge (UNESCO, 2012). A rigid and inflexible attachment program that prepares young people for the specific occupation may soon disappear. Timar, (1990), notes that the economy is a complicated living organism that undergoes constant change. Some elements of the system die away and are replaced by new elements. Existing organizations can hardly be expected to forecast their destruction; on the contrary, they are generally unaware of their survival and future development may depend on a radical transformation of their production profile, their structure, and work.

### **2.3.3 Relevance of Industrial Attachment Programme**

Bottoms and McNally (2008) observe that industrial attachment plays a dual role; to prepare students for the ever-increasing workplace requirements and further study. The relevance of an education system means that education has to be first accepted by the market players and secondly it should be adaptable and applicable to the job market. This requires that the education system itself, training institutions, and the industry have to be in consonance in terms of their objectives and expectations. Training institutions are faced with many challenging demands by the industry. Some industries generally require a workforce with general education where students can apply their acquired skills in any relevant discipline while others require occupation training that is specific in which case students learn a specific trade alone. These diverse requirements by the industry/employer define the relevance of the education system and in particular the Industrial Attachment Programme. Students attached in firms with these various demands may in the end come out with different orientations about the same industry! As training institutions struggle to keep abreast of the job requirements, they have to know the specific requirements by specific industries. Industries that place prime emphasis on the level of initial training and adaptability of staff they recruit may require different training patterns for attaches in the industry, unlike the ones that place a strong emphasis on workers possessing little skills but sound practical know-how.

Attachment is crucial in that it links training and the world of work especially in today's world where scientific and technological advances are continuously changing. IAP is a marketing forum for various tertiary education institutions, the more students do well, the more they market their institutions and ultimately the more reputable institutions become and eventually attract high caliber students (Mohamad, 2006).

The industrial attachment also fosters close relationships between the industry and the training institutions. In this regard, institutions of higher learning raise their flags following addressing stakeholder needs in their curriculum. This is necessitated by the interactive mode of student training through the IAP. Students on industrial attachment also assist current employees in increasing their skill level and knowledge base through research. Organizations that attach students have been seen to gain new perspectives and technologies with the scope of the student's program and the students can also develop what is on the ground by implementing what they have learned.

#### **2.4 Problem Solving Skills**

Novel ways to enhance lifelong, life-wide, and workplace learning are emerging (Hamalaunen, De Wever, Nissinen, & Cincinnato (2017). The interest in research focusing on learning taking place at work, through work, and for work has considerably increased over the past two decades (Tynjala, 2013). Problem-solving skills among other attributes of employability skills have high level of importance in the modern work place (Suarta, Suwintana, Sudhana, Hariyanti, 2017). Employability skills are needed by students to prepare themselves to meet the needs of many different occupations upon graduation (Shafie & Nayan, 2010).

A large majority of employers concede that today's new graduates are not able to think critically and creatively, solve problems, or write well (White, 2013). Feedback from employers' surveys indicates that tertiary graduates are particularly weak in professional competencies such as problem-solving, organizational skills, ICT, communication, and teamwork (World Bank, 2009). At the same time, several studies indicate that teachers do not integrate these competencies into learning and assessment strategies (NCTVET, 2006; NCVER, 2003; Barrie, 2005).

James & James (2004) posit that historically there was an emphasis on hard skills being the only requirement for employment; however recent times have strongly indicated that technical skills alone cannot secure employment. It is therefore crucial to investigate the extent to which these competencies are developed during attachment to assist graduates to gain employment and maintain their placements in the workforce. On-the-job training, internship, or industrial attachment involves training on the job during normal operational conditions, and on-site training, which is conducted away from the work process (Australian National Training Authority, 2003). It allows the trainees to understand what, how, and why they are learning in the classroom. In addition to the acquisition of technical skills and transfer of learning, training at the workplace enables learners to acquire other generic skills such as communication, teamwork, problem-solving, and adaptability skills that are equally required to perform professional tasks (Waterhouse and Virgona, 2004; Crebert *et al.*, 2004). After each attachment period, the student is assessed by the industry or organization and the training institution with the students' reports, which are scored as part of the termly assessment. Training institutions and industry collaborate to ensure students' placement, supervision, and assessment during the industrial attachment. Performance criteria include attendance, participation, teamwork, assignments, research work, quizzes, and presentations. The assessment of practical components is particularly based on the demonstration of skills, preferably in the work environment, or simulations on the job conditions and students are assessed as 'competent' or 'not yet competent' against the industry competency standards.

For students to demonstrate problem-solving skills, work ethics, and other desirable skills then they have to be dynamic and receptive to change. This proposition is however challenged by Von Treurer *et.al* (2010) who says that while work-based

learning makes an important first step in helping students to bridge the gap between theory and application, they do not provide the depth and complexity necessary to master problem-solving skills. Students who train mostly in problem-solving tend to develop a serious handicap. They rely heavily on solutions they have seen before, rather than working from first principles.

The core objective of industrial attachment programs is the development of relevant student abilities and skills. It aims to transfer theory to practice, to develop generic skills, and improve graduate employability. These work-readiness skills may include self-confidence, critical thinking, effective communication, problem-solving skills, teamwork, and professionalism (Bates, 2005, Freudenberg *et al.*, 2008). There are documented improvements in those completing industrial attachment programs in a range of employability skills including team working, problem-solving, communication, information literacy, and professionalism (Coll *et al.* 2009; Freudenberg, Brimble and Cameron 2011).

## **2.5 Attitude and Social Skills**

Graduates are also expected to have a number of personal attributes that include: self-awareness, self-confidence, independence, emotional intelligence, flexibility and adaptability, stress tolerance, creativity and initiative, willingness to learn, reflectiveness, lifelong learning, and professional behaviour. Little (2010) draws attention to the need for positive attitudes towards applied learning within the world of business by students on industrial attachment. He suggests that learners should be fully committed, engaged, and prepared to apply and reflect on how academic learning relates to the world of work. According to Sivotwa *et al* (2014), the critical elements require positive student attitudes that include being responsible, open, punctual, and cooperative. In particular, the aspect of being responsible requires

students to be attentive, observant, and seek clarity in cases where they do not understand. Human capital injection by way of instilling generic skills at the tertiary level will ensure the employability of graduates and their eventual fast acceleration/leapfrog in the corporate ladder (Brown *et al.* 2003).

The academic has not instilled sufficient skills through curriculum design and implementation on appropriate pedagogical methods towards trainees. Perez *et al.* (2010) have referred to the challenges related to the multidimensional nature of the employability concept, especially the difficulty of disentangling the role of education and training systems from other factors in evaluating labour market outcomes. This brings out the importance of learning institutions to provide necessary avenues for the students to attend enough IAP during their tenure before graduation to prepare them for the workplace environment.

Conflict Theory emphasizes the fact that different groups, namely employer, academia, employees, have varying access to power and opportunities (Brown *et al.* 2003). In the capital-labour conflict, there has been a continuous debate in terms of the employer's role in imparting generic skills and employees not acquiring adequate skills through training offered by employers. Meanwhile, there is the employer-academia conflict where the employers feel that academia has not been providing adequate acquisition of generic skills to the graduates. The theory argues for the employers to take responsibility in providing work experience to the graduates and not directing the responsibilities to the universities alone. By so doing, the graduates will acquire the necessary skills that they need away from the learning institution and this, therefore, ensures that the employer, during the industrial attachment, prepares the student directly for the work-life skills that are expected from them.

The consensus theory and the conflict theory have their limitations given the historical evolution of generic skills acquisition, were not only learning environment provides an avenue for such skill development but it also entails pre-college environment such as school, family, social, neighbourhood, and workplace environment. There is now the need to examine the employers' perspective in terms of the skill gap and the various stakeholders like schools to take responsibility in overcoming the gap.

## **2.6 Professional Ethics and Culture**

As outlined by the NITC (2004) objectives, one of these was to ensure students exhibit appropriate work ethics and culture. Campbell, Harrington, and Verenikina (2009) argue that professional culture and attitude are predominantly formed in the earlier interactions that an emerging professional has with his/her respective field. They contend that this is done within the first few years of practice that a practitioner develops the core foundation of his/her future practice and career. It can therefore be argued that IAP provides strong foundations required for the development of the ethical practitioner and empowering the self.

The preparation of IAP needs to include education and training around professional ethics of which a primary focus must be the development of a critical mind with acknowledgment of the social and cultural contexts of the practice (Campbell and Zegwaard, 2011). While employers grapple with great concern about the character of young employees and students on attachment, there is a need for an articulated relationship between espoused values within the discourse of the academic and workplace settings (Campbell and Zegwaard, 2011). Behavioural change should be seen as one of the major fruits of an effective IAP within the context of increasing youth employability in the labour market. Often, students do not realize the importance of possessing transferable skills and they assume that mastery of skills

within their discipline is enough to get that all-important, post-graduation position. On the contrary, Savickas (2005) disagrees and says individuals' experiences do matter. His theory of career construction through experiences involves individuals imposing meaning on past and present experiences and future goals that influence their work lives.

While organizations maintain a specific culture, the emerging professional is not devoid of pre-existing histories and disposition to understand the workplace through a lens formed from this (Campbell, 2009). The role played by host organizations should therefore not be understated. A high premium should be placed on industry supervisors and training officers to ensure that attaches get the right professional initiation in the right direction. Moral values such as integrity, faithfulness, reliability self-drive among others should be seen as major pillars that nurture up a successful employee and more especially for upcoming and potential employees. Whilst there can be conceived importance of education in organizational practices and codes, there must within approaches to ethics education, be a focus on the development of critical capacities of the mind and the intuition to exercise moral courage in response to the challenges of the workplace (Uddin, 2013).

Faced with financial and academic challenges, oftentimes students find themselves at crossroads; whether to uphold the moral integrity or act otherwise to meet their short-run desires. Foley (2004) suggests that the practitioner should act, reflect on the action, and learning from the reflection, plan new actions. Since employees must do more to help the company be successful, students seeking jobs need skills that emphasize innovation and cultural competency, as well as critical thinking, problem-solving, communication, teamwork, ethical and social responsibility, and foundational



skills like reading and basic math (Schuele and Madison, 2010). They conclude by saying that job applicants must be able to convince prospective employers that, as employees, they will bring value to an organization. In addition, the assertion that employers are becoming increasingly cautious to employ not only employees with academic qualifications but also with non-academic dispositions should not be underrated. Indeed IAP should develop generic or professional skills to improve employability and work readiness (Patrick & Crebert, 2004; Martin & Leberman, 2005; Campbell, & Zegwaard, 2011). This kind of training should aim at ensuring students gain and apply knowledge, skills, and feelings in an immediate relevant setting or working environment (Smith, 2010).

### **2.7 Collaboration of TVET Institutions with the Industry.**

Hernes and Martin (2013) observe that industry-institute partnership is a relatively new phenomenon that emerged during the past century and has strongly expanded in scope and number over the recent decades. It covers a wide range of diverse realities from the more traditional, such as placement schemes, staff exchanges, consultancy services, continuing professional development, joint research, and development, to the recent areas such as small enterprises development-the creation of spin-offs for the joint commercialization of research and design for collaborative research at the national and international level.

Kenya Vision 2030 places a strong emphasis on the linkage between training institutions and the industry. The Sessional Paper No 1 of 2005 recommended that training institutions must strengthen the level of collaboration with industry for meaningful education to take place. The paper asserts that industrial harmony is critical to enhancing productivity and firm competitiveness. The Third International

Congress on Technical and Vocational Education and Training on “Transforming TVET: Building Skills for Work and Life” in Shanghai, China recommended that TVET delivery must involve a broader partnership with multiple stakeholders. This in turn calls for greater coordination. Participants acknowledged the crucial role of national, regional, and international coordination and cooperation between partners, as well as linkages with social partners and industries, for TVET to become accessible and efficient in various and alternative ways linked to lifelong learning. Effective stakeholder dialogue for curriculum development, program design, delivery, and governance is needed. The conference concluded that the new paradigm of TVET should be conceived of in such a way that training systems can respond to the demands of the labour market, while at the same time helping citizens achieve skills required for work and lifelong learning.

An industrial program, if well-coordinated, should bring strong ties between training institutions and the industry. Much has been said about this relationship. Kenya Vision 2030 notes that 'poor linkage between the labour market and training institutions has led to skill mismatch and underdevelopment.' This linkage is partly possible if both parties realize that the relationship that is to exist should be symbiotic in nature. Industries have to accept that any workforce comes from training institutions and therefore should not take advantage of the cheap labour provided by the attachés at almost free cost. Training institutions on the other hand have to note that their success depends on their absorption level of their graduates into the job market.

In contrast, training systems are under pressure because of technological change, the shortening of the product cycle, and new forms of workplace organizations are

changing the context in which decisions about training are made. The training has to ensure that the labour force meets the ever more stringent national and international qualification requirements (ILO, 2006). It's in this context that ILO regarded basic education as a necessary but not sufficient condition for adapting training to the challenges of economic globalization. The organization recommended the promotion of partnerships with business as one of the solutions to these challenges.

The rate of technological advancement seems to be faster compared to the classroom experience students are often exposed to. Burns (2002) argues that while it is unlikely that a surgeon from a hundred years ago could work, walk into an operating theatre in today's world and set the work, there is no doubt that a teacher from a hundred years ago could walk into a modern classroom, pick up the chalk and carry on. The teacher is the conduit through which the stuff of learning is piped into learners' needs to abreast themselves with modern technology. This can be enhanced through collaborative programs between training institutions and the industry. This relationship facilitates quality experience for the students as well as contributing to the development of the workplace (Groenewald, 2004). He further argues that this collaboration should not be seen as a panacea, however, but a critical reflection on these and other research capacities. Partnerships reveal significant problems in translating intentions into successful practice.

ILO (2006) argues that collaboration may occur at many levels including the macro (policy) level, the meso (sectoral) level, and the micro (enterprise) level. The scope ranges between the national training policies, legislation, and systems by government and employers to local training. The various strategies to strengthen this collaboration include; involving all stakeholders concerned with technical education both in the

formal and informal sector, promoting contacts and cooperation between managers of the education system and the working world, involving industry in needs analysis, curriculum development, and certification, involving the community and local stakeholders in local development projects, inducing training institutions to participate actively in these projects by allowing the use of their facilities, producing goods and providing services, bringing training sites closer to production sites. Bertrand (2004) adds that other forms of partnership include; representation of the social partners on training boards and committees, service support such as knowledge transfer through workshops and conferences, financing institutional programs by industries such as excursions, technical assistance, philanthropic donations, provision of bursary to needy and bright students and through collaborative research and development.

The observation by Dewey (1938) sums it all that 'training institutions are not mere adjuncts to industry or students, a human means to material means' on the contrary; they should provide learners with a critical spirit and intellectual capacity to transform an industrial and educational structure. A balance between the expectations of both parties has to be struck to avoid mistrust and exploitation. Scheffler (1995) argues that 'in an attempt to increase collaboration with the industry, trainers should be called upon to think of knowledge as the fruit of original inquiry. Industry/firms or employers should not be seen as the only ones in possession of facts which are often stubborn, inert, and unquestionable. There should be a free flow of information and ideas between training institutions and the industry to enhance development.

Abu Raihan (2014) did a study on Collaboration between TVET Institutions and Industries in Bangladesh to Enhance Employability Skills and the study found out that successful collaboration between TVET and the industry share several features. This

includes institutions modifying courses to meet the demands of enterprises while enterprises provide practical training to trainees in their workplaces, they jointly developed curriculum and program, the shared management structure that incorporates enterprise into the school management process, and the enterprise's provision of work-based practical training to instructors to update their knowledge and skills. He further argued that there has been rapid improvement in partnerships between the two parties as they have begun to realize that effective collaboration brings them mutual benefits. The study did not point out the need to strengthen the collaboration through an effective IAP and this is the gap that this study sought to fill.

## **2.8 Challenges of Industrial Attachment Programmes**

There is no doubt that no specialized training can nowadays suffice a preparation for a career. Education is a continuous process and therefore personnel have to always update their skills. The acquisition of these specialized training is coupled with many challenges. World Bank (2008) notes that, 'virtually all nations today, rich and poor alike find themselves in the clutches of deepening educational crisis. It is in essence a crisis of maladjustment of disparities taking many forms-between educational systems and their environment'. In this respect, the work environment in schools where students get most of the theoretical skills differs significantly from that of the real work environment in which most students will eventually be required to function. The need for real work experience means that training institutions have to strengthen their relations with the industry if these goals have to be achieved. More so the training in these institutions has to meet the current global market requirements. However, the challenge is that 'teachers; the conduits by which the 'stuff of learning' gets piped into the classroom may not be abreast of the latest developments in the industry. This is a real concern because it is the teacher who is to assess the students in the industry.

While the teacher struggles to be abreast with the happenings in the industry, 'the constant job changes ever more owing to changes in technology, economic structures, and organization' has far-reaching implication on the methodology of training itself. It is generally a cornerstone rule that teachers who supervise industrial attachment must be experts in two arts; the art of teaching and the art of a craft or trade.

The success of the attachment program therefore largely depends on whether the teacher has mastered both these arts. This argument means that teachers within the TVET subsector must know the technique of the trade to command the respect of employers and foremen in the industry.

Ferns, (2012), observed that the abilities of teachers to supervise and assess students on industrial attachment are in proportion to the operational process he/she undertakes to teach. This is confirmed by Richardson, *et al.*, (2013), who state that ideally, industry assessors should clearly understand their role in the assessment and should be occupationally and professionally competent. However, the challenge is on capacity building in management and technical skills for monitoring educational processes and outcomes. TVET institutions have to train experts and professionals and build infrastructure to operate the rigorous assessment processes. The expertise and experience of industry trainers should have up-to-date skills and knowledge that will be imparted to students in a manner that fosters some sense of continuous improvement among learners (Monarth, 2008).

Training institutions should therefore put an eye on the curricula while strategically placing their ears in the industry. Perhaps the question that we should ask is; who is to be on the lead? Training institutions that have the mandate to deliver curricula that is often not dynamic and irrelevant or industries that are always by nature ahead in terms

of technology yet have no mandate to train? It is within the context of knowledge-intensive societies and demand for 'hands-on' experienced and skilled labour force that institute–industry linkages should become more prominent on the agenda of higher education if technical institutions have to remain relevant and vibrant in this globally competitive world.

Psachoropoulos and Woodhall (1985), observe that 'while jobs frequently change, they rarely disappear altogether, nor do completely new jobs often come into being'. Although technologies may change, occupations may not significantly change. On the contrary, these technological changes may bring a new set of job requirements altogether. Training institutions have to be aware of these dynamics.

The utility of setting up a training evaluation system that is not solely on formal criteria such as examinations which assess mainly knowledge but rather on an evaluation of the abilities acquired cannot be overemphasized. The requirement that employers emphasize behaviour related skills place pressure on training institutions to impart such skills on trainees. The expected outcome of the education system should be the ability of the manpower to adapt to a dynamic work environment. The skill imparted 'should go hand in hand with greater adaptability of the training system. This adaptability is the response to the unpredictability of the labour market' posed by the ever-changing technology and job dynamics (Bertrand, 2004).

Training institutions have been accused of being rigid and unresponsive in the structure and curriculum of the training courses. Training institutions operate in a closed circuit thus making it difficult to engage in the external demand of the world of work. Reddan and Harrison (2010) warned that TVET institutions need to restructure their programs to be responsive to the needs of the job and job market only. Relations

of TVET institutions with the socioeconomic environment depend, however, widely on the particular dynamism of certain individuals, often teaching personnel, personal contacts, and top-level management support which backs up the academic department (Martin, 2000). TVET institutions have a mandate, as part of the sensitization strategy to inform potential enterprises that the higher education establishment has interesting things to offer (Martin, 2000; Mann, 2012).

Donkor *et al* (2009) examined the organizational issues and challenges of the supervised industrial attachment offered by a technical and vocational teacher education program in Ghana. The major findings showed that stakeholders were dissatisfied with interalia: the weightings of the assessment components, students having to find their attachment places, program duration, and the absence of an industrial liaison officer. Related challenges cited include lack of free access to equipment and machines, lack of financial resources to assist with transport costs to and from work, and the time spent looking for attachment places.

Carlson (2002) identified a number of challenges faced by students while on attachment. Firstly, stiff competition for attachment places from students from other universities seeking placements. Secondly, the gender bias against female students for placements in some male-dominated work environments. This was cited to be prevalent in engineering fields that were previously the domain for males. Thirdly, the lack of a clear policy on supplementary financial support for students on attachment to cover transport and related costs, and lastly, high expectations on the part of organizations for students accepted on the attachment program.

Other complications associated with industrial attachment are: a lack of guidance and clarity regarding supervisors' roles in assessment; the inadequacy of typical university



assessments for capturing the application of skills in work settings; the resource-intensive nature of good practice in regards to training and support for industry partners; that students rarely complete assessment tasks entirely by themselves; and often have different needs and expectations on placement (Billett, 2008; Hodges, 2011; Orrell, Cooper & Bowden, 2010; Richardson *et al.*, 2013; Stagnitti, Schoo, & Welch, 2010).

There are many challenges associated with an effective industrial attachment experience, including difficulties in locating placements; inadequate environment and design for effective learning during the work placement; and students not meeting required performance standards expected by the host employer (Procter, 2011). Afonja *et al.* (2005) found that the placement of students for industrial work experience is problematic. Attaches face challenges of shortage of training equipment and poor relations with supervisors. These issues stifle effective industrial attachment. Female students also complain of sexual harassment by supervisors and employers and stiff competition from male attaches. Attaches also complain of inadequate finance to sustain their lives during attachment.

Generally, no technical and vocational education and training system can be functional consistently with inadequate funding (Gasskov, 1994). Publicly financing TVET in many countries remains a major challenge with all the associated weaknesses, including supply-driven orientation and the absence of feedback from employers, low flexibility and training quality, high cost of training, weak orientation towards equity, and others (McBride, 1994.)

According to UNESCO, (2012), there are three major sources from where an educational system may receive funding: the public sector, the private sector, and the

international community. The degree of inputs from these sources, the financial modalities in place, the beneficiaries of these resources, and the mechanism of allocation are the main indicators that set these countries apart Timmerman (2008), asserts that the nature of the finance may also be dependent on the model and the core focus of the training concept, for instance, the core of the qualification concept, the style and the component of the qualification may be pivoted on the functions of which the qualification will have, as in the case of the English function-oriented model. Financing may also be dependent on a set of qualification as recommended by researchers, as in the case of France science-oriented model (Ross & Hallak, 1999), Switzerland, Germany, and Australia incline the TVET model whereas China, Japan, and South Korea follow a model which can be termed as enterprise-oriented. The attention of the USA and Italy seems to be directed towards the job requirement orientation-model (Ross & Hallak, 1999). To address the question of how much and what resources are available for the development of education, the most common indicator of how much public education expenditure as a percentage of the gross domestic expenditure (GDP), it is important to consider public sector investment in education since the public sector plays a major role in educational provision (Nomura & Bruneforth, 2011).

Palmer, (2018) opines that TVET funding in most developing countries is usually from three key sources comprising government grants, student fees, and the private sector. Other sources are consisting of employee contributions, private donations, internally generated income, and external assistance (development grants and co-operating partner loans). TVET providers normally have a different mixture of funding streams across the countries. In most cases, the primary source of funds in many public TVET institutions significantly is government funding, while student

fees constitute the major source of funds for privately owned training providers. In-service training costs in companies are principally borne by the respective companies.

Adegbenjo, A & Olubato, Y. (2015) argue that, in sub-Saharan Africa, education has been afflicted by a serious scarcity of funds since TVET, and entrepreneurship education has single-handedly been funded by governments. Further, they argue that technical and vocational training is a practice-oriented activity and entails the disbursement of large amounts of financial resources to ensure that there are sufficient numbers of competent and appropriately skilled persons, to support economic and national growth.

A study in Bangladesh on financing TVET concluded that the level of financing was mostly influenced by the government and the community. Serious flaws and deficiencies in respect of adequacy, access, and efficiency were highlighted. Furthermore, the revelation was that the training modes and systems were centralized and nonresponsive to industry and communities (BAFED, 2015). Chukwumaijem (2015) conducted a study on the quality of the TVET program in Nigeria and challenges and improvement strategies. The study revealed the challenges of attaining quality TVET programs and some of them were lack of required facilities and poor funding. This study is relevant to the present study since it highlights the challenges in TVET's (though not exhaustively). It is also based in Nigeria while the present study is located in Kenya. Njoki (2014) found out that TVET institutions receive limited funding from the industry and donors hence these institutions have insufficient funds to support most of the study programs and enable trainer's career progression. Gandhi (2013) says in his report that the responsibility for financing VET and academic school education in general rests with the township and local governments. The

government should offer a stipend for vocational students to encourage students to access TIVET training. In Kenya, TVET training is organized along with the County polytechnics, the former youth polytechnic funded by County governments, and the National TVET institutions comprising of the National Polytechnics, Technical training Institutes, and The Kenya Technical Trainers College funded by the National government.

It can therefore be argued that costs attached to each program have to be managed and minimized for sustainability (Meyer, 2008). The industrial attachment program has direct and indirect costs met by the students, institutions, and host organizations. Cost reduction measures have to be implemented without compromising the quality of training. Basic costs for IAP cover training, transport, fuel, communication, accommodation, and allowances. Other countries such as Germany, Ghana, and the United States of America crafted policies that encourage host organizations in taking more trainees for attachment through paying allowances for the students and reducing tax for participating companies. In this regard, training institutions, host organizations, and students will be sensitized on the importance of the industrial attachment and this enhanced motivation to participate in the program (Andoh *et al.*, (2016), Donkor, Nsoh, & Mitchual, 2009). Other strategies for improving the IAP include monitoring and evaluation systems by the government, tertiary education institutions, and the host organizations. Frequent supervision visits to students on attachment by the training institutions were indicated to improve the industrial attachment program in many countries. This indicated that they are part and parcel in getting instant feedback (Donkor *et al.*, 2009). This will enhance sound decision making for transformational training through the IAP, sourcing adequate funding and policy reviews for the sustainability of the industrial attachment program.

## 2.9 Summary of Literature Review

Arising from the foregoing discussion, it's worth noting that any attempt to evaluate any program should be seen as a noble idea. Programs such as IAP are a product of conscious and systematic efforts directed at obtaining knowledge of a problem. Training institutions should develop strategies and intervening practices to ameliorate- if not eliminate problems that impact negatively on training outcomes. Better monitoring systems as well as sustained human resource development should continually be the pride of any forward-thinking TVET managers and institutions. The development of a vibrant workforce that is filled with professional ethics and morals should be the dream of any individuals who act as conduits through which the stuff of learning takes place. The 21<sup>st</sup>-century TVET teacher has to be vastly abreast of the happenings in the industry. The teacher must have the art and the craft of the trade. TVET Teachers have to learn how to teach 'employees'-their students and behave like employers-know what they do. Training institutions on the other hand have to come to terms with the reality that nowadays, training for human resources is no longer a preserve for training institutions. Employing companies are increasingly seeing the need to train their work force. This calls for deeper collaborative programs between training institutions and the industry. Much has been said about the need to strengthen the industrial attachment program; its role and importance to individual students, training institutions, and the employer.

A preview of the literature review shows that IAP is fairly an old practice among educational institutions yet with limited literature. Past studies on IAP have majorly majored on the assessment criteria and how these assessments can be more efficient. For example, the study by Kathryn *et al* (2014) used the integrated model for evaluation of work placement using the triangulated approach. The model, though

quite elaborate, was seen to be quite a time consuming, complex and that each discipline would be responsible for evaluating its placement programs.

The study by Martin and Leberman (2005), sought to establish the benefits of an internship program. It found out that the industry benefits most from an internship program. The study however did not address the missing link between the industry-institute relationship and how training institutions and students can benefit. A study by Kiplagat, Khamasi & Karei (2016) sought to establish the students' experience of Industrial Attachment at the University of Eldoret in Kenya. Although the study does not give the research methodology, they conclude that most students liked the knowledge and skills and experiences acquired while on IAP. They however recommend that training institutions should play an active role in placing students for IAP so as to increase the gains and consequently, quality outcomes. Muthoni, Gunga, Mutahi & Origa sought to establish the Influence of Industrial Attachment on the Competence of Instructors and Students in Enabling Creative Innovations for industrialization in Kenya. The study however focused on Teaching Staffs Industrial Attachment (TSIA) and fails to show whether teachers were actually placed in the industry. They conclude however that collaborative industrial attachment between instructors and students could actually improve students 'competence in creative innovations.

The study by McDermott (2008) sought to address the missing link between training institutions and the industry. The variables under study were however limited to communication and the perception of the industry about the program. The findings fell short of looking at the role of training institutions in initiating and strengthening this link.

The work of Sturre *et al* (2012) was quite interesting as it looked at an internship with emphasis on the procedural justice of placement. However, their study did not show how procedural justice of placement determines students' outcomes.

The study by Donkor *et al* (2009) in Ghana focused on organizational issues and challenges of IAP. The findings show that organizational issues are related to the challenges of the program. The study by Luu (2019) sought to establish the challenges facing hospitality industrial attachment as a learning experience in selected institutions in Nairobi- Kenya. The study concluded that lack of adequate guidance and support to students during the industrial attachment, lack of adequate funds and time allocated for industrial attachment visits and reversed priority of the roles played by the immediate-on-the-job supervisors of the students on attachment were among the challenges the program faced.

The study by Daniel (2011) used a longitudinal study between the years 2000 and 2010, using a mixed method approach. Although the response rate was low(38.5%), he concludes that the sponsoring university department and placement organization should provide some sort of training program and/or classroom preparation preceding the student's participation at the placement site and that internship program coordinators should be available to meet as needed by the student intern.

Chinyemba & Chirimuta (2012) assessed Issues and Concerns of industrial attachment program at the University of Zambia. The study used a cross-sectional survey technique to establish the strengths and weaknesses in the supervision and assessment practices of industrial attachment. The findings were that supervision and assessment of industrial attachment was not competency-based and recommends

professional development of lecturers to handle competency-based assessments as footholds for improving connectivity between workplace and learning.

This study sought to assess the effectiveness of IAP within TVET institutions in the North Rift Region. It looks at whether TVET institutions have realized their IAP goals as they send out students on the attachment program. Collaborative and linkage programs between training institutions and the industry are hereby discussed and finally, the challenges of the program are assessed.

There is no doubt that little consideration has been given to IAP outcomes, that is to say, its effectiveness in relation to how student's exhibit desired outcomes and how a strong institute-industry relationship can be a springboard for innovation and creativity among young upcoming graduates. This study hopes to fill the gap and reinforce knowledge on workplace skill requirement through An IAP.



## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Introduction**

This chapter describes the research design and the methods that were used to collect data in accordance with objectives of the study. The chapter discusses on the following; study area, research design, target population, sample size and sampling techniques, development and use of survey instruments, validity and reliability of research instruments.

#### **3.2 Study Area**

The study focused on TVET institutions in the North Rift Region which include National Polytechnics, Technical Training Institutes (TTIs), Technical and Vocational Institutes (TVCS) and Institutes of Technology. The North Rift Region in Kenya comprises Counties forged from the former Rift Valley Province with the following Counties: Uasin Gishu, Nandi, Trans Nzoia, Baringo, Turkana, West Pokot, Samburu and Elgeyo Marakwet Counties.

As at the time of data collection, the region had six Public TVET Institutions one national polytechnic. The study was limited to one National Polytechnic within an urban setting, (Eldoret Polytechnic in Uasin Gishu County), one Technical Training Institute in a rural setting (Ol'lessos T.T.I in Nandi County,) and one Technical Training Institute in an urban setting (Rift Valley Technical Training Institute in Uasin Gishu County). In 2019/20 academic year, the number of students placed into TVET institutions to pursue diploma increased by 12.3 per cent to 64,539 in 2019/20, while those students placed to pursue certificate courses went up by 34.3 per cent to 43,662 in 2019/20(Economic Survey, 2020).

### **3.3 Research Design**

Research design is the conceptual structure within which research is conducted and constitutes the blue print for the collection, measurement and analysis of data (Orodho, 2003). The study employed descriptive research design. Descriptive research design seeks to describe a situation, phenomenon, and problem or issue (Kumar, 2011) and is a method of collecting information by interviewing or administering a questionnaire to a sample of individuals (Orodho, 2003). The major purpose of descriptive research is description of the state of affairs as it exists at present (Kothari, 2004). It seeks to collect information about attitude, opinion, habits and perception or any of the variety of education or social issues (Orodho and Kombo, 2002). Kerlinger (1986) points out that descriptive studies are not only restricted to fact findings, but may often result in the formulation of important principles of knowledge and solution to significant problems. They involve measurement, classification, analysis, comparison and interpretation of data with narration of facts and characteristics concerning individual, group or situation (Kothari, 2004).

### **3.4 Target Population**

The research targeted all Second-Year Diploma students and all Second-Year Craft students who had successfully undergone an IAP for the period between September 2016 and December 2016. It also targeted lecturers within the TVET institutions and Industrial Liaison Officers in charge of attachment programmes. Workplace supervisors/training officers of selected firms which usually absorb most students on IAP were also included in the research. Students' enrolment for these institutions stood at 7556 with 270 lecturers (County Director of Technical Training Report, September, 2015).

### 3.5 Sample Size and Sampling Technique

#### 3.5.1 Sample Size

It refers to the number of items to be selected from the universe to constitute a sample (Kothari, 2004). The table below shows how the sample size was arrived at.

**Table 3:1 Sample Size of Respondents**

<b>Institution</b>	<b>Respondents</b>	<b>Total population</b>	<b>Target population</b>	<b>Sample population</b>
<b>Eldoret</b>	Lecturers	120	44	13
<b>National Polytechnic</b>	Students	3500	321	96
	ILO	1	1	1
<b>Rift Valley T.T.I</b>	Lecturers	85	31	9
	Students	2500	229	69
	ILO	1	1	1
<b>Ol'lessos T.T.I</b>	Lecturers	65	24	7
	Students	1556	143	43
	ILO	1	1	1
<b>Total population</b>	Lecturers	270	99	29
	Students	7556	693	208
	ILO	3	3	3
<b>Firms</b>	Work Based Supervisors	215	40	12

**Source: Researcher, 2019**

While being guided by the objectives of the study and the researcher's knowledge on target population, the study sample was drawn from the study population as indicated above. As shown in Table 3.1, there were 7556 students, 270 lecturers/trainers and three ILOs in the three TVET institutions. Out of 7556 students, 693 had gone for IAP in the period between September 2016 and December 2016. Additionally, 99 lecturers out of the total 270 had participated in the IAP assessment exercise during

this period. The study sampled 30% (Kerlinger, 1986) of students and lecturers. This represented 208 students and 29 lecturers respectively. Further, one ILO was purposively chosen from each of the institution. 12 work-based supervisors were purposively selected from firms that had hosted majority of students on IAP.

### **3.5.2 Sampling Techniques and Procedures**

The study employed proportionate stratified sampling, simple random sampling and purposive sampling techniques.

#### **3.5.2.1 Proportionate Stratified Sampling**

In proportionate stratified sampling, the number of elements from each stratum in relation to its proportion in the total population is selected (Kumar, 2011). The three TVET institutions formed three strata. For example, at Eldoret National Polytechnic, the student population was 3500 students out of a total population of 7556. Given that there was a total of 693 students who participated in IAP, the proportion was  $(\frac{3500}{7556} \times 693) = 321$ . After getting this number (321), 30% of these target population was selected giving a sample population size of 96 students. The 96 students were selected using simple random technique. The same procedure was applied for the other strata of both students and lecturers. Stratified proportionate sampling was used because the goal was to achieve desired representation from the three institutions. Its advantage is that it ensures inclusion in the sample of every sub group.

#### **3.5.2.2 Simple Random Sampling**

Simple random sampling technique was employed to select 94 students from Eldoret Polytechnic, 69 students from Rift Valley Technical Training Institute and 43 students from Ol'lessos Technical Training Institute. Further, the procedure was used to select 13 lecturers from Eldoret Polytechnic, 9 lecturers from Rift Valley Technical Training

Institute and 7 lecturers from Ol'lessos Technical Training Institute. Respondents in both categories had actively participated in the IAP. This technique was preferred because it limited human choice and tendency to introduce biased sampling procedures.

### **3.5.2.3 Purposive Sampling**

Purposive sampling was employed to select the industrial liaison officers from the three institutions and 12 workplace supervisors from various firms respectively. Work based supervisors from firms that had the highest number of students were selected for the study.

## **3.6 Research Instruments**

The researcher employed two data collecting instruments in the study. They are the questionnaire and the interview schedule.

### **3.6.1 The Students and Lecturers Questionnaires**

A questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms and usually mailed to respondents who are expected to read and understand the questions, and write down the reply in the space provided (Kothari, 2004). Questionnaire technique is preferred because it covers a wide range of area and also it reaches many respondents at a cheaper cost and also saves a lot of time (Kothari, 2004). The study had two sets of questionnaires namely; Questionnaires for students (Appendix A) and questionnaires for lecturers (Appendix B). The questionnaire was divided into various parts that touched on IAP objectives, collaboration and linkages and finally the challenges of the programme. A five-point Likert Scale was used in each part to assess the various factors affecting the

effectiveness of the Industrial Attachment Programme. Open and closed ended questions were also used in the questionnaire.

### **3.6.2 Interview Schedule for Industrial Liaison Officers and Work Based Supervisors**

A structured interview involves the use of a set of predetermined questions and of high standardized techniques of recording and follows a rigid procedure laid down and asking questions in a form or order prescribed (Kothari, 2004). Structured interviews are easier to analyse, are economical and provide a basis for generalization (Kothari, 2004). The researcher used structured interview schedule (Appendix C) to interview the industrial liaison officers and Work based Supervisors.

### **3.7 Data Collection and Administration of Instruments**

The researcher employed two research assistants to administer questionnaires. The researcher checked for completeness after the questionnaires had been administered. The researcher administered the interview schedule.

### **3.8 Reliability and Validity of Research Instruments**

#### **3.8.1 Validity**

Validity measures what is intended to be measured” (Field, 2005) and explains how well the collected data covers the actual area of investigation (Ghauri and Gronhaug, 2005). There are several forms of validity. These include; face validity, content validity, construct validity, criterion validity and reliability. In this study, face and content validity of the questionnaire was established using a panel of experts who explored the theoretical constructs and how the constructs were represented in an operational measure in the questionnaires (Cohen *et al*, 1998; Bhattacharjee, 2012). Face validity is established when an individual, who is an expert on the research

subject, reviewing the questionnaire (instrument) concludes that it measures the characteristic or trait of interest (Miller, 2015). It is a researcher's subjective assessment of the presentation and relevance of the measuring instrument as to whether the items in the instrument appear to be relevant, reasonable, and unambiguous and clear (Oluwatayo, 2012). A dichotomous scale for the items in the questionnaire was used with categorical option of "Yes" and "No" to indicate a favourable and Unfavourable item respectively. Favourable items meant that the items were objectively structured and were positively classified under the thematic category. Cohen's Kappa Index (CKI) was used in determining the inter-rater agreement for the questionnaires for students and for lecturers by two supervisors and three other senior research experts within the department of educational planning at Moi University. The inter-rater agreement was 0.75 and 0.80 on questionnaires for students and lecturers respectively. DM. *et al.* (1975) recommended a minimally acceptable Kappa of 0.60 for inter-rater agreement.

Content validity on the other hand is "the degree to which items in an instrument reflects the content universe to which the instrument will be generalized" (Straub, Boudreau *et al.* 2004). It involves evaluation of a new survey instrument in order to ensure that it includes all the items that are essential and eliminates undesirable items to a particular construct domain (Lewis *et al.*, 1995, Boudreau *et al.*, 2001). Relevant literature reviews were done followed by an evaluation of the research instruments by five experts, two of whom were the researcher's supervisors. Their suggestion and clarifications were used to improve representation and sampling adequacy of the content that were investigated. A content validity survey was then generated where each item was assessed using a three point scale (not necessary, useful but not essential and essential). The content validity ratio (CVR) proposed by Lawshe (1975)

was adopted to calculate how many experts rated the items as “essential”. The CVR Lawshe method is given by;

$$\text{CVR} = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

The CVR was 1 since all the five experts rated the items as “essential”. Lawshe (1975), recommended a minimum ratio of 0.99 for the number of experts not exceeding 5.

### **3.8.2 Reliability**

The test retest method was used to assess the reliability of the data. Reliability is the extent to which research results are consistent and replicable (Kothari, 2004; Drost, 2011). It is a measure of consistency between measurements of the same construct administered to the same sample at two different points in time (Drost, 2011; Miller, 2017). The study made the following assumptions; the characteristics that were measured did not change over the time period and that the time period is long enough yet short in time that the respondents’ memories of taking the test at the first administration of the questionnaire did not influence their scores at the second administration of the questionnaire. The test-retest method involved administering the same questionnaire twice to 5 lecturers and 20 students at Sigalagala National Polytechnic, an institution outside the North Rift Region. The test retest was administered one week apart in order to control for maturation effect. After administering the questionnaires, a correlation coefficient was calculated to indicate the relationship between the two set of scores. Pearson product moment correlation coefficient was used to determine the correlation coefficient ( $\Gamma^1_x$ ). The reliability of the entire instrument was obtained through  $\Gamma^1_{xx} = 2\Gamma_{xx} / (1 + \Gamma_{xx})$ , where  $\Gamma_{xx}$  is the



correlation between the two tests. Below is the result for the reliability of the questionnaires.

$$\frac{2 \times 0.7581}{1.7581} = 0.8624 \quad \text{from students and} \quad \frac{2 \times 0.8125}{1.8125} = 0.8955 \quad \text{from lecturers}$$

Straub *et al.*, (2004) suggest that reliability should be equal to or above 0.60 for a pilot study. The value established was above the minimum value recommended. However, Wilson (2010) weighs in by stating that for a test to be reliable, it also needs to be valid.

### **3.9 Data Analysis and Presentation**

Merriam (1988) and Marshall and Rossman (1989) contend that data collection and data analysis must be a simultaneous process in research. Data was collected through multiple sources and included interview schedules and questionnaires from students and lecturers. A simultaneous methodological triangulation method was used to analyze both qualitative and quantitative data. This approach sought to strengthen reliability as well as internal validity (Merriam, 1988). Relevant document analysis was further employed to ensure internal validity. Data collected was examined for completeness, comprehensibility, consistency and reliability. The researcher closely supervised the data collection process and ensured that the two research assistants performed their duty with honesty and without prejudice.

Quantitative data from the questionnaire was analysed using Statistical Package for Social Science (SPSS) Version 21 for Windows, a product of SPSS, Inc. The data was tabulated in the form of frequencies, percentages, tables and charts. Further, the researcher also used inferential statistics in the data analysis by running an item by item paired samples t-test analysis to determine whether there were any significant

differences in the mean ratings as per the objectives of the study. Paired sample t test is used to compare the outcome of two groups (Cresswell & Cressell, 2018). The mean ratings for various items were compared (Before and after IAP)

Schatzman and Strauss (1973) argue that qualitative data analysis primarily entails classifying things, persons, and events and the properties which characterize them. This characterization seeks to identify and describe patterns and themes from the perspective of the participant(s), then attempts to understand and explain these patterns and themes (Creswell & Creswell, 2018; Agar, 1980). Data collected through interview schedule was first coded into symbols that were tabulated and counted. Since structured interviews involve the use of a set of predetermined questions, a high standardized technique of recording was adopted. This was followed by a rigid procedure of asking questions thematically in a form as prescribed in the interview schedule form. The analysis was done thematically with relevant narrations from interviewees. This was deemed easier and economical.

### **3.10 Ethical Consideration**

Marshall & Rossman (2011) stress the importance of addressing ethical considerations in research since participant observation invades the life of the informant. Ethical considerations in research are critical. Ethics are the norms or standards for conduct that distinguish between right and wrong. They help to determine the difference between acceptable and unacceptable behaviours. Ethical considerations are important in research because ethical standards prevent against the fabrication or falsifying of data and therefore, promote the pursuit of knowledge and truth which is the primary goal of research. It is also critical for collaborative work because it encourages an environment of trust, accountability, and mutual respect among researchers. Researchers must also adhere to ethical standards in order for the

public to support and believe in the research. Because ethical considerations are so important in research, many professional associations and agencies have adopted codes and policies that outline ethical behaviour and guide researchers. These codes address issues such as honesty, objectivity, respect for intellectual property, social responsibility, confidentiality, non-discrimination and many others. The codes and policies provide basic guidelines.

The study was undertaken bearing in mind all the ethical concerns and attempts to uphold them. The researcher addressed ethical consideration in the following ways; A written permission to proceed with the study as articulated was received from host institutions of IAP and TVET manager and further, a research permit was given by National Commission for Science and Technology (NACOSTI); the research objectives were articulated verbally and in writing for respondents to clearly understand the questionnaire; Respondent's rights, interests and wishes were considered first regarding reporting the data, finally, respondents' confidentiality and anonymity was assured.

### **3.11 Chapter Summary**

This chapter presented the process involved in carrying out a study on the effectiveness of supervised industrial attachment programme in Technical and Vocational Education Training (TVET) Institutions in the North Rift Region in Kenya. The key areas discussed included the study area, research design, target population, sampling technique and sample size, research instruments, validity and reliability of data instruments, methods of data analysis and presentation and ethical consideration of the study. This chapter sought to justify the relevance and validity of the processes that guided and supported the study.

## **CHAPTER FOUR**

### **DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION**

#### **4.1 Introduction**

The chapter aims at presenting, analysing and interpreting data from respondents from questionnaires and interview schedules. The general objective of the study was to assess the effectiveness of supervised industrial attachment programme within the Technical and Vocational Education Training (TVET) institutions. The specific research objectives that provided the field study framework were;

1. To establish the influence of IAP on students' ability to demonstrate problem solving skills
2. To determine the effect of IAP on students' ability to exhibit appropriate attitude and social skills
3. To determine the effect of IAP on students' ability to exhibit work ethics and culture.
4. To establish the various forms of collaboration between TVET and industry/employers
5. To establish the challenges of Industrial Attachment Program

##### **4.1.1 Response Rate**

The response rate of the survey is a significant concern in a study because it ensures the questionnaires collected are valid for data analysis (Hair et al., 2010). From the 208 questionnaires given to student respondents, a total of 199 questionnaires were returned. This represented a response rate of 96.1%. After editing for accuracy, completeness and homogeneity, 182 qualified for the final analysis. Of the 29

lecturers who were targeted for the research, the researcher managed to get 25 responses. This represented 86.2% response rate.

## 4.2 Background Information for Students and Lecturers

The questionnaire contained preliminary questions that were aimed at ascertaining the eligibility, reliability and ability of respondents.

### 4.2.1 Lecturers' Background Information

The Table 4.1 below shows lecturers background information that includes length of service, whether they had ever been attached to an industry; how many times a lecturer had assessed students and whether the said assessor/lecturers had attended any workshop/seminar related to IAP.

**Table 4:1 Background Information of Lecturers**

Item	Response	Frequency	Percentage
Length of Service	Less than one year	3	12
	1-3 yrs.	6	24
	5-10 yrs.	9	36
	More than 10 yrs.	7	28
Have been attached in an industry	YES	3	12
	NO	22	88
Times assessed students	Only once	5	20
	Only twice	8	32
	More than two times	12	48
Have attended seminars/workshops	YES	3	12
	NO	22	88

**Source: Researcher's Compilation (2019)**

As shown in Table 4.1 above, of the twenty five lecturers who participated in the study, 3 lecturers (12%) had worked for a period of less than one year, 6(24%) had worked for a period of between one year and less than three years, 9(36%) had

worked for a period of between five years and ten years, 7 (28 %) had worked for a period of more than ten years. The data shows that a majority of the lecturers (64%) had worked for over five years. A majority of lecturers had worked for a considerable period of time and were considered experienced enough to make any worthwhile assessment on industrial attachment programme. Research studies have shown positive associations between student achievements and trainers' academic skills, level of content knowledge, years of experience and participation in content-related professional development opportunities.

As to whether the said lecturers had undergone an industrial attachment programme to acquaint themselves with the happenings in the industry, 3 (12%) said they had been attached while 22 (88%) said they had not. Further, 5 (20%) of the lecturers had assessed students only once, 8 (32%) had assessed only twice and 12 (48%) had assessed more than two times. Trainer experience is considered one of the major tenets of quality teaching. Industrial exposure by lecturers is considered one of the urgent programmes that training institutions should endeavour to facilitate. This brings about relevant knowledge content by instructors/lecturers who are expected to be experts in two arts; the art of teaching and the art of a craft or trade Ferns, (2012). Close interaction between the institute and the industry/enterprise is seen as the platform for showcasing best practices, latest technological advancements and their implementation and impact on the Industry. It is basically considered to improve the quality of technical and vocational education adequately to meet the needs of the industry and economy (Majumdar, 2008). The results further showed that only 3 (12%) of the lecturers had attended seminars/workshops related to IAP while 22 (88%) had not. This explains perhaps why professional development has been a key emphasis among instructors in tertiary institutions. Training institutions should

perhaps put more emphasis of prior preparation for industrial assessment in order to ensure its effectiveness. Skills formation strategies are long-term processes that help align skills supply, workforce development and business strategy through the collaborative action of industry, government, education and training sectors for best practices (Atienza, 2008).

#### 4.2.2 Students Background Information

The questionnaire sought to establish whether students had undergone the IAP, whether they had been assessed by lecturers and how many times they were assessed.

**Table 4:2 Students Background Information**

Item	Response	Frequency	Percentage
Attended industrial attachment programme	YES	182	87.9
	NO	17	8.2
Assessed by lecturers	YES	171	94.5
	NO	11	5.5
Times assessed by lecturers	Only once	162	94.2
	Only twice	7	4.1
	More than two times	3	1.7

**Source: Researcher's Compilation (2019)**

From the Table 4.2 above, it's observed that out of the 199 students who participated in the survey, 182(87.9%) actually attended the IAP while 17(8.2%) did not attend the programme. Although most students had undergone the IAP, few did not. There is likelihood that some courses offered by training institutions were not on high demand in the market and that explains why attachment places for such courses were difficult to come by. Further, attachment opportunities seem to be fewer than the supply capacity of training institutions. Students have had challenges of taking longer periods before finding the appropriate attachment places or sometimes getting places that are

not necessarily in line with their area of study. UNESCO (2012) observed that apprenticeships have long been a tool to provide young people with work experience and opportunity to learn on the job and pathways to employment and ensure learners adapt to the changing labour market. It broadens students' occupational focus and develops their abilities to adapt and diffuse new technologies.

As to the question whether they had been assessed by lecturers, 171 (94.5%) said they had been assessed while 10 (5.5%) said that they were not assessed. The study further sought to establish the average number of assessments. The results show that 162 (94.2%) said they were assessed only once, 7 (4.1%) said they were assessed only twice and 3 (1.7%) said they were assessed more than two times. Assessment by lecturers provides training institutions with the necessary feedback about the quality of training they offer. Perhaps a close supervision and monitoring by training institutions on students on attachment is seen as a key factor in ensuring student discipline while on attachment. Amadio (2013) argues that student assessment is an integral part of the education process as it provides vital information on the quality of learning. There is a growing emphasis worldwide on the need to equip learners with a set of key competences and essential skills that are necessary for success in education and for personal development. Amadio (2013) and Billet (2000) add that this new focus also reflects the shift from educational inputs to learning outcomes, including the generic competences that all students need for life and work in contemporary society and that are increasingly valued by employers along with academic knowledge, cognitive abilities and technical skills. Furthermore, education must be relevant to meet the needs of both learners and potential employers.

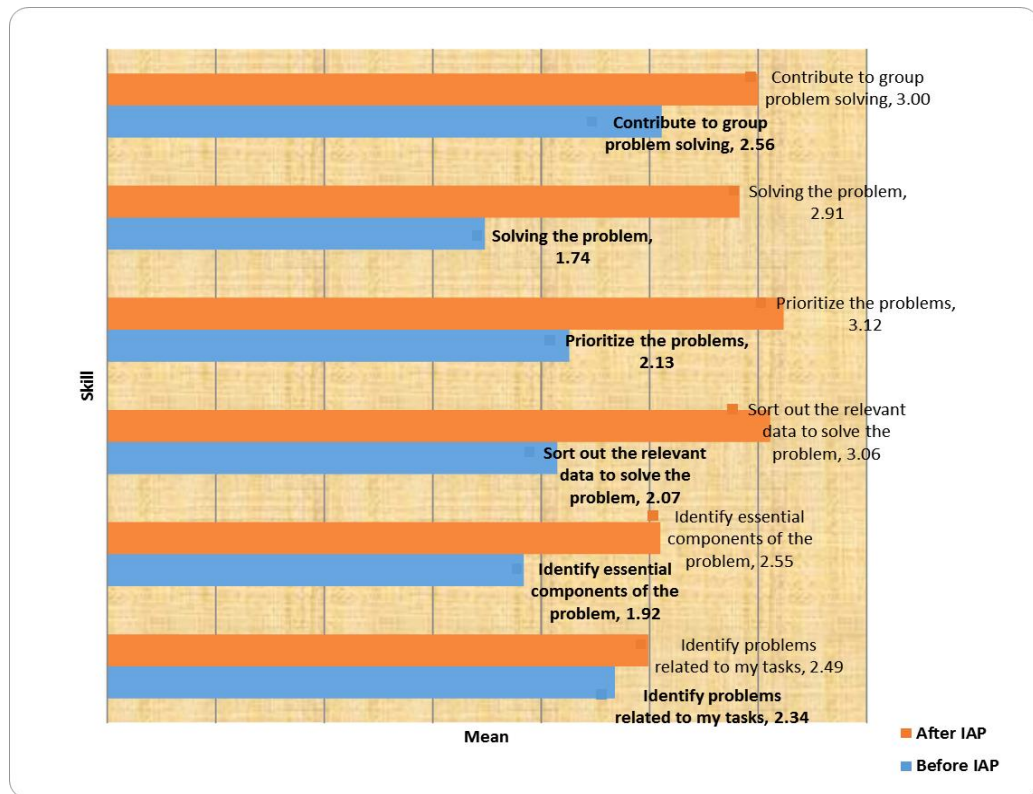


### **4.3 Influence of IAP on Student's Ability to Demonstrate Problem Solving Skills**

#### **4.3.1 Demonstration of Problem Solving Skills**

The first objective was to establish the influence of IAP on student's ability to demonstrate problem solving skills. The objective was broken down into various components. Students were asked to show if they could demonstrate problem solving skills at the start of IAP and at the end of IAP in the following areas; Identification of problems related to their tasks, identifying essential components of a problem, sorting out relevant data to solve the problem, prioritizing the problem and lastly solving the problem.

The rating scale for this portion of the study was; 5= to a very great extent, 4= to a great extent, 3= to some extent, 2= little and 1= virtually nothing. Data was analysed by use of means and graphs and by comparing means obtained by students before the IAP and after the IAP. The Figure 4.1 shows the mean ratings of students on demonstration of problem solving skills.



**Figure 4.1: Demonstration of Problem-Solving Skills**

**Source: Researcher's computation (2019)**

Figure 4.1 shows the mean rating of skill level as demonstrated in students' ability to solve problems. It's observed that the mean ratings before the attachment were generally lower compared to the mean ratings after the IAP. This difference could be accounted for the different methods of learning in the two settings-training institutions and the industry.

Training institutions generally promote theoretical learning where students are expected to be logical and critical thinkers while industrial based learning is more practical or solution based learning. Industrial attachment perhaps provides a more hands on experience where students are likely to easily relate complex ideas and construct meaning out of them. This explains why the mean ratings are high after the industrial attachment experience as compared to before the IAP experience. Koh and

Luke (2009) established that the majority of classroom assessment tasks/assignments are not highly intellectually demanding and do not require students to demonstrate deep understanding of subject matter, nor application of advanced concepts and skills or making connections to the real world. This explains the reason why IAP is critical in bridging this gap.

#### **4.3.2 Contributing to Group Problem Solving**

As illustrated by Figure 4.1, the mean score by students before the IAP indicated that; contributing to group problem solving had the highest mean of 2.56 while students' ability to solve a problem had the least mean of 1.74. Generally, this implies that students had acquired some skills prior to the IAP and most likely place is from training institutions. Group problem solving had the highest mean rating before IAP owing to the fact that perhaps trainers often use discussion method which students had perfected over time.

Group problem solving can be enhanced through engagement in group activities and other programmes that require shared ideas while executing them. Attaches have been seen to be less experienced and therefore don't seem to be reliable in group problem solving in the eye of employers. This perception should however not be a hindrance to attaches involvement in group work. These findings concur with Monarth, (2008) that potential future employees are expected to think critically and creatively, share thoughts and opinions, use good judgment, and make decisions while fostering some sense of continuous improvement. These findings also agree with Freudenberg *et al.*, (2008) who contend that effective problem solvers know how to gather and evaluate information to define and clarify a problem.

### **4.3.3 Solving the specific problem**

The mean score of student's ratings on ability to solve specific problems was 1.74 before IAP and 2.91 after the IAP. Perhaps the low score in students' ability to solve the specific problem is indicative of deficiency of training institutions to impart students with relevant skills for their specific trade. It was noted that this item scored the least mean among all the items that were tested. Work performance in the eyes of employers is judged by the productivity of its employees. Employees and by implication attachés' are expected to be practical oriented, producing tangible results. Failure to produce measurable results may lead to one being declared redundant. Industry players have specific requirements from training institutions one of which is ability to solve specific problem setups. This failure may lead to a mismatch between industry demand and supply of human capital by training institutions. Work based learning is to a great extent for the acquisition of practical skills and not necessarily for students to acquire generic skill (Billet, 2010). However, it was noted that students reported a remarkable improvement after the IAP. Indeed, IAP was seen as a major catalyst in ensuring problem solving skills among learners. On the other hand, employers want employees who can work through problems on their own as effective members of a team.

### **4.3.4 Ability to prioritize problems, Sorting out relevant data, and identification of essential components of the problem**

Ability to prioritize problems arising from the IAP experience had the highest mean rating of 3.11, followed by sorting out data to solve the problem with a mean of 3.06 after the IAP. Students' ability to identify problems related to their task had the least score of 2.49. Problem solving involves a number of steps that are interrelated. One should be able to identify the essential components of the problem, sort out relevant

data of the problem and then prioritize the problems. A problem is a situation for which an individual who confronts it has no algorithm that will generate a solution. Industrial attachment provides an environment in which students can clearly connect these facts and come up with possible solutions.

Faced with many alternatives, it means that students have learnt the value of generating more than one action alternative and can weigh all the implications of a plan before deciding to implement it. The findings by Mulcahy and Forest (1976) showed that identifying priority alternatives doesn't mean simply developing a 'list'. We need to discover the potential consequences and the relative importance of the possible priorities. The possible consequences of each priority alternative will, in most cases, be judged by one's own perception and the perception of others. The irony however is that TVET training is majorly focused on technical skills while employers constantly rate generic skills above technical skills (Jackling, 2009). Views from workplace supervisors indicated that students are taught to prioritize duties while on attachment. They are taught to put priorities to the different tasks and work with those priorities in order to minimize stress levels and work optimally.

The study further made use of t-test to establish whether the differences in the means before and after IAP were significant at 5% confidence level. Table 4.3 shows the t-value and the p value for the various scores.

**Table 4:3 Demonstration of problem solving skills**

<b>Problem solving skills</b>	Mean Before attachment	Mean After attachment	t value	P value	Interpretation
Identify problems related to tasks	2.3395	2.4938	-1.408	0.041	IAP contributed significantly to students ability to identifying problems related to specific tasks
Identify essential components of the problem	2.5556	3.000	-1.129	0.004	IAP contributed significantly to students ability to identify essential components of the problem
Sort out the relevant data to solve the problem	2.0741	3.0556	-8.320	0.003	IAP contributed significantly to students ability to sort out the relevant data to solve the problem
Prioritize the problems	2.1296	3.1173	-9.031	0.000	IAP contributed significantly to students ability to prioritize the problems
Solving specific problems	1.7406	2.9136	-10.409	0.000	IAP contributed significantly to students ability solving the problem
Contribute to group problem solving	1.9198	2.5494	-0.849	0.137	IAP did not contribute significantly to students ability to group problem solving

**Source: Researcher's Computation (2019)**

From Table 4.3, it can be seen that the p value for students' ability to identify problems related to task was 0.041, which was less than 0.05 at 5% confidence level. Perhaps it may imply that IAP did contribute significantly to student's ability to identify problems related to tasks they were doing. This assertion was reinforced by workplace supervisors who participated in the interview. All the workplace supervisors were in agreement that IAP assisted students in problem solving skills; one workplace supervisor rightly put it that IAP was very important in assisting students develop skills for solving problems in the work place. This is one area where

the course work doesn't cover. He further said that a student has to go through the industrial experience practically to understand how to solve problems that arise in the work place, of course, with the assistance of the workplace supervisor and in reference to the content learnt in college. Moreover, in his opinion, IAP assisted students in a great deal in handling workplace problems.

As indicated in Table 4.3, it can be said that all the items tested showed that IAP had significantly contributed to the students' ability to demonstrate problem solving skills apart from contributing to group problem solving which had a p-value of 0.137 at 95% level of significance. The reason as to why there may not have been any significant contribution to group problem solving may be due to; the perception that attaches are trainees with limited knowledge and experience and therefore may not significantly bring desired ideas, poor supervisor-attaché relationship where attaches are expected to take orders or instructions only most of the time, and most importantly the discussion method of teaching in training institutes meant that there was nothing new to bring on board over this matter. One of the workplace supervisor interviewed, said that employees expect students to be free, to express themselves and more so bring in innovative ideas that can bring positive change in the organization. Some students feel timid and incompetent, not necessarily because they have no ideas, but because they cannot fully express themselves.

These findings confirm that goals of IAP on problem solving to a large extent are being realized by training institutions. National Industrial Training Council (NITC, 2004) and the National Industrial Training Authority (NITA, 2013) observed that IAP should influence the quality and efficiency of training in order to secure adequate supply of well-equipped manpower with problem solving skills as well as appropriate work ethics. Groenewald (2004) and UNESCO (2007) add that work based

experience facilitates quality experience for students as well as contributing to the development of the workplace. Further, the findings indicate that most respondents were able to tackle problems with ease, and that the ability to tackle technical problems by students requires a high degree of specialization and depth. This is advanced by Bertrand (2004; Martin (2001) and ILO, (2007).

#### **4.4 Effect of IAP on Students' Ability to Exhibit Appropriate Attitude and Social Skills**

The second objective sought to determine the influence of IAP on student's ability to exhibit appropriate work ethics and social skills. The objective was broken down into various items. Students were asked to show if they could demonstrate appropriate work ethics and social skills. Data was tested by using the 5 point Lickert Scale of; 5= to a very great extent, 4= to a great extent, 3= to some extent, 2= little and 1= virtually nothing. Means obtained before and after the IAP were compared.

The skills analysed in this objective include student's ability to; undertake reasonable job-related risks, work independently, solve work related conflicts, adapt to situation of change, respond positively to constructive criticism and to function well in stressful conditions. The table below shows the results of a repeated t-test and the mean ratings of the skills assessed before and after the IAP by student respondents.



**Table 4.4 Students' ability to exhibit appropriate attitude and social skills**

<b>Exhibit appropriate attitude and social skills</b>		<b>Mean Before attachment</b>	<b>Mean After attachment</b>	<b>t value</b>	<b>P value</b>	<b>Interpretation</b>
Ability to take reasonable job-related risks	to	2.14	2.73	-2.952	0.004	IAP contributed significantly to students ability to take reasonable job-related risks
Ability to work independently	to	2.40	3.01	5.340	0.000	IAP contributed significantly to students ability to work independently
Ability to solve work related conflicts	to work	2.51	2.82	2.890	0.003	IAP contributed significantly to students ability to solve work related conflicts
Ability to adapt to situation of change	to of	1.98	2.67	-5.143	0.001	IAP contributed significantly to students ability to adapt to situation of change
Ability to respond positively to constructive criticism	to	1.98	2.78	-5.750	0.000	IAP contributed significantly to students ability to constructive criticism
Ability to function well in stressful conditions	to	1.81	2.52	-5.171	0.000	IAP contributed significantly to students ability to function well in stressful conditions

**Source: Researcher's computation (2019)**

Students are expected to demonstrate appropriate attitude and social skills in their respective courses. This creates a compelling desire to pursue the career path with determination and vigour. Work remains a central interest in the lives of most people therefore their attitude towards work ultimately determines their output and job

satisfaction. The findings established from the table 4.4 gives an impression that generally, IAP significantly contributed to creating best practices in terms of attitude and social skills among students. Attitudes to work are also changing, in parallel with changes in the world of work. For example Svotwa *et al* (2014) observed that the critical elements require positive student attitudes that include being responsible, open, punctual and cooperative. In particular, the aspect of being responsible requires students to be attentive, observant and seek clarity in cases where they do not understand. The t-test analysis shows how specific items related to work attitude and social skills among students. The following discussion gives the findings as per the specific items.

#### **4.4.1 Ability to Take Reasonable Job-Related Risks**

The results from Table 4.4 indicate that students' ability to take reasonable job-related risks had a mean rating of 2.14 before the attachment and 2.73 after the attachment. The p-value of  $0.004 < 0.05$  seem to give an indication that IAP contributed significantly to students' ability to take reasonable job-related risks. It was observed that a positive attitude towards work determines ones perception towards taking job related risks. The current work place provides a myriad of risks among employees. A positive change in the mean implies that the industrial experience provides not only opportunities for learning but more so with moral courage and inculcation of professionalism for new entrants in the field. Industrial attachment provides an enabling environment for students to be exposed to various machines and equipment that may not necessarily exist in training institutions. This therefore requires a student's courage to be able to learn these machines some of which may be risky to operate. Risks are unknown, unexpected, undesirable and unpredictable occurrences within the confinement of a working environment.

#### **4.4.2 Ability to Work Independently**

From the results tabulated in Table 4.4, the mean ratings before and after IAP was 2.40 and 3.01 respectively. The p-value of 0.000 gives an indication that IAP contributed significantly to the ability of students to work independently. The ability to work independently does not necessarily imply that students are not expected to work in a team. It appears that students with independence show creativity, knowledge and self-confidence in what they are doing. Individuals who possess skills in working independently has proved that they have; organizational skills, multitasking ability, discipline, ability to compromise, ability to deal with rejection and not to take it personally, flexibility. The IAP assisted students to work independently. This is because, all the time, students are given work plans to follow and guide them through the attachment process. These work plans assist them to work independently, but of course they have to be supervised just to be sure they are doing the right thing. These findings have parallel observation by the UNESCO (2011) report on work ethics, which noted that, the attitude of young people to work is characterized by an early desire for independence with regard to parental environment. The report however noted that the level of education is considered a favourable sign of overall ability to adapt to change and work independently.

#### **4.4.3 Ability to Solve Work Related Conflicts**

The findings of the study show that the mean ratings before and after IAP was 2.51 and 2.82 respectively. A p-value of 0.003 gives an indication that IAP contributed significantly to students ability to solve work related conflicts. Conflict resolution, whether in a working environment or in a learning environment is seen as one of the major pillars for peaceful co-existence. Conflict in work place may arise from interpersonal relations, management issues, absenteeism, slander, negative work

environment among others. Students and employees come from diverse backgrounds and this calls for a common understanding. The work place did provide opportunity for students to solve work related conflicts that ranged from issues of time management, meeting deadlines and dressing code among others. This finding implies that training institutions and workplace management needs to create awareness about the divergent employee interests between employees' professional obligations and their private interests and how better to solve them whenever they arise. Another study by Iqbal, (2012) on employee relations showed that there is a negative relationship between job stress and job satisfaction and consequently workers' productivity. These findings confirm that students are expected to develop appropriate skills and attitudes in order to interact sustainably with the work environment for socio-economic development.

#### **4.4.4 Ability to adapt to situation of change**

Adaptation to change had a mean rating of 1.98 before IAP and 2.67 after the IAP. These results are not unexpected owing to the fact that workplace environment is significantly different from a classroom environment in terms of their settings. A p-value of  $0.001 < 0.05$  seems to give an indication that IAP may have contributed significantly to students' ability to adapt to situation of change. The rapid evolution of techniques and the obsolescence of knowledge make it necessary for strategic employers to incorporate lifelong learning among employees. This is because of changing jobs and job requirements that propels individuals to specialize and adapt to uncertain future job requirements (UNESCO, 2011). The positive change implies that IAP provided diverse working environment that was different from the learning environment in college. Students were exposed to employees with different ages and that they needed to look upon them as fellow workers with a common goal. It was

further expected of them to have basic knowledge about their respective career notwithstanding the level of content they had been taught in college. The study established through an interview with workplace supervisors that those students who had gone for IAP for the first time had a big challenge to adapt to the workplace. It was also revealed through the interview with work place supervisor that the academic language and the field language seem to be different! Some of the terms used in college for specific tools especially for workshop based courses and civil engineering were quite different from the terms used in the field. As such they were expected to learn the 'language' of the field.

This is confirmed by (CCETSW 1995a: 19) and Parsloe (1988) who argue that students who have undergone IAP should be able to apply their knowledge and learning to new situations through appraising what is general and what is particular in each situation. The UNESCO (2011) report on work ethics confirms that the work environment is increasingly becoming complex and that the culture of recognizing, identifying and seeking answers to various issues requires one to be able to adapt and be flexible to situation of change. The report goes on to argue that the adaptation to change is the compass that will allow each and every one to be guided throughout life. This need to adapt quickly to the global environment is forcing firms to strive for higher productivity, flexibility and innovation (ILO, 2006).

#### **4.4.5 Ability to Respond positively to constructive criticism**

Ability to respond positively to constructive criticism got a mean rating of 1.98 before the attachment and 2.78 after the attachment. The p-value noted as 0.000 gives an impression that perhaps IAP significantly contributed to students' ability to respond positively to constructive criticism. IAP is a training ground for most students who for obvious reason do not have industrial experience. This leaves them with limited

knowledge and as such bound to mistakes while executing their assignments. This was confirmed through the interviews with work based supervisors who indicated that supervisors and fellow employees occasionally have the opportunity to critically analyse what attachés are doing, often times with criticism. Students' ability to respond positively to these criticisms implies a level of maturity being acquired on the part of the student. Most workplace supervisors agreed that depending on the area of attachment, IAP assists students to respond positively to constructive criticism and in solving work related conflicts. This happens whenever they are faced with a challenge on time management, to report to work early or asked to 'dress up' properly. Amadio (2013) found out that the idea that people's attitude towards their jobs are based on information they get from other people. They adopt attitudes and behaviour in keeping with the cues provided by others with whom they come into contact. He notes however that attitudes are not perfect predictors of behaviour.

#### **4.4.6 Ability to function well in stressful conditions**

Ability to function well in stressful conditions had a mean rating of 1.81 before IAP and 2.52 after the IAP. The p-value established was 0.000 an indication that IAP may have contributed significantly to students' ability to function well in stressful conditions. The implication of students' ability to function well in a stressful environment borders on their determination to pursue their respective careers irrespective of the challenges that may lie ahead. Professional development requires strong passion and love for what one does and that one is willing to pay the price for the ultimate goal of self-fulfilment. These findings confirm with ILO (2012) report on strategic training partnership that, in the new environment, job security and sustainability is related to competencies and performance in the labour market which

depends on employees' ability to take initiative, risks and manage stressful conditions in order to achieve personal development.

From Table 4.4, it can be noted that students were keen to practice appropriate work ethics and social skills. The study indicated that students' ability to adapt to situation of change and ability to respond positively to constructive criticism had the least score of 1.99 and 1.98 respectively. The study reveals that indeed most respondents agreed to a great extent that IAP had enabled them acquire skills in adapting to change (mean score of 2.67 and response to constructive criticism (Highest mean of 2.78). Further, IAP did contribute significantly to students' ability to take reasonable job related risks. The p value obtained was 0.004 which was above 0.05 at 95% level of significance. This means that the mean difference before the IAP and after the IAP were significant and therefore IAP contributed significantly to students acquisition in skills related to work ethics and social skills.

Similarly, it is worth noting that students' ability to function well in stressful environment does not imply that there were more stressful conditions at the place of attachment compared to their training institutions. The stress may be as a result of the requirement by management to follow strict deadlines and maximize on time. The p value obtained was 0.000 at 95% level of significance. The workplace supervisors were also of the view that IAP assisted students to clearly set priorities at work after the researcher interviewed ILO's to find out how IAP assisted students set their priorities right.

#### **4.5 Effect of IAP on students' ability to exhibit work ethics and culture**

The third objective was to determine the influence of IAP on student's ability to practice appropriate work ethics and culture. The objective was broken down into

various components which included ability to; work well with fellow employees, relate well with supervisors, listen attentively, establish good rapport with subordinates, exhibition of communication skills and exhibition of team work. An item by item t-test was run to establish whether the mean ratings by students were statistically significant before and after the IAP. The table below shows the results of a t-test and the mean ratings various items at 0.05 level of significance.



**Table 4.5: Practice of appropriate work ethics and culture**

<b>Practice of appropriate work ethics and culture</b>	<b>Mean score before IAP</b>	<b>Mean score after IAP</b>	<b>t-value</b>	<b>p value</b>	<b>Interpretation</b>
Ability to work well with fellow employees	1.93	2.84	-8.146	0.000	IAP contributed significantly to students ability to work well with fellow employees
Ability to relate well with my supervisors	2.40	2.85	-4.005	0.000	IAP contributed significantly to students ability to relate well with supervisors
Ability to listen attentively	2.29	3.00	-6.077	0.000	IAP contributed significantly to students ability to listen attentively
Ability to establish good rapport with your subordinates	2.56	2.91	-3.062	0.003	IAP contributed significantly to students ability to establish good rapport with subordinates
Ability to exhibit communication skills	2.45	2.55	-.861	0.390	IAP did not contribute significantly to students ability to exhibit communication skills
Ability to exhibit team work	2.19	2.75	-4.074	0.000	IAP contributed significantly to students ability to exhibit team work

**Source: Researcher's computation (2019)**

Changes in the world of work over the past decade have significantly altered the psychological contracts that existed in the industrial era between workers and their employers, and workers and their work. Workers are being urged to become managers of their careers and to regard themselves as being self-employed. The environment of the global economy raises questions about how positive work habits and attitudes may be developed. Indeed, the concept of positive work habits and attitudes itself may need to be rethought. Dwyer, (2000) in a study, established that “occupational destiny is not all there is to life” for the post-1970 generation. The participants attached at

least equal importance to areas of their lives other than paid employment and defined themselves, not in terms of what they might or might not do in the paid workforce but rather, in terms of ‘mixed patterns’ of life that interconnect ‘being’ and ‘doing’.

Changes in the structure of work have seen a corresponding shift in thinking about the relationship between individuals and work. It is less certain whether the term “work ethic” will endure in the post-industrial era, or even whether it is still relevant or appropriate. Hagstrom and Gamberale (1995), for example, describe the rise of post-materialistic values and attitudes towards work such as “quality of life, self-expression, belonging and intellectual satisfaction” which are important to young people in the post-industrial society. The foregoing analysis and discussion however shows how work ethics and culture was influenced by IAP.

#### **4.5.1 Ability to Work Well With Fellow Employees**

The mean ratings by student respondents before and after the IAP at 0.05 level of significance were 1.93 and 2.84 respectively. The p-value found was  $0.000 < 0.05$  implying that IAP may have contributed significantly to students’ ability to work well with fellow employees. Strong and cordial employee relations have been considered as an asset by good forward looking managers. Attachment programme provides students with opportunity to learn and relate well with fellow employees. The performance of a student on attachment programme constitutes his overall performance in the final grade on industrial attachment. This seems to make students work hard to relate with other fellow employees. Khalida, (2010) established that there is a positive relationship between friendship and job satisfaction. This is reinforced by Goleman (1995) who argues that workers need proficiency in managing relationships and building networks to get the desired results from others and reach personal goal and the ability to find common ground and build rapport. On the

contrary, Blackler, (1995) says that there is the danger of preoccupation with technology that gives little attention to processing (social and organizational) through which knowledge combines and interacts in different ways.

Putnam, (1996) concludes and asserts that social network enables participants to act together more effectively to pursue shared objectives. He termed this as social capital which included social life features such as networks, norms and trust. However Svotwa et al (2014) notes that value judgments about whether work habits and attitudes are positive may vary between individuals and organizations and from one task or culture to another. Thus, situational variables may influence whether or not work habits and attitudes are considered positive.

#### **4.5.2 Ability to Relate Well With My Supervisors**

Responses from students showed that the mean ratings before the IAP were 2.40 and 2.85 respectively at 0.05 level of significance. The p-value was established at 0.000 giving an indication that IAP may have contributed significantly to students' ability to relate well with supervisors. The exhibition of this behaviour perhaps implies that, students have a realization of the role played by supervisors during attachment. This knowledge may be the cause as to why most of them are disciplined since they know that behaving otherwise might lead to bad recommendation by these supervisors. Graham (2010) found out that members of the organization adapt their values to that of the organization and especially to the most influential individuals in the company. Supervisors are looked upon by attachés as mentors and as such should be seen to display high standards of professionalism. On the contrary, Schuller (2000) established that focus on human capital may lead to a very unbalanced emphasis on the acquisition of skills and competences which ignores the way in which such

knowledge is embedded in a complex web of social relationships. Knowledge acquisition is reinforced by the kind of relationship that exists in a workplace. Schein (1995) adds that good relations among employees are built on mutuality and trust where people contribute out of a sense of commitment and solidarity.

#### **4.5.3 Ability to Exhibit Communication Skills**

From Table 4.5, students' ability to exhibit communication skills had a t value of 0.390 at 5% confidence level. The value implies that IAP did not significantly contribute to students' ability to exhibit communication skills. Communication skills, including writing skills, collecting and using information to communicate with others and use of ICT has been considered critical for any aspiring employee. This result concurs with Donkor *et al* (2009) who established that a poor student in practical manipulative skills could write a good report to earn a grade higher than a student who is practically good but unable to present a good report owing to poor communication skills.

#### **4.5.4 Ability to Exhibit Team Work**

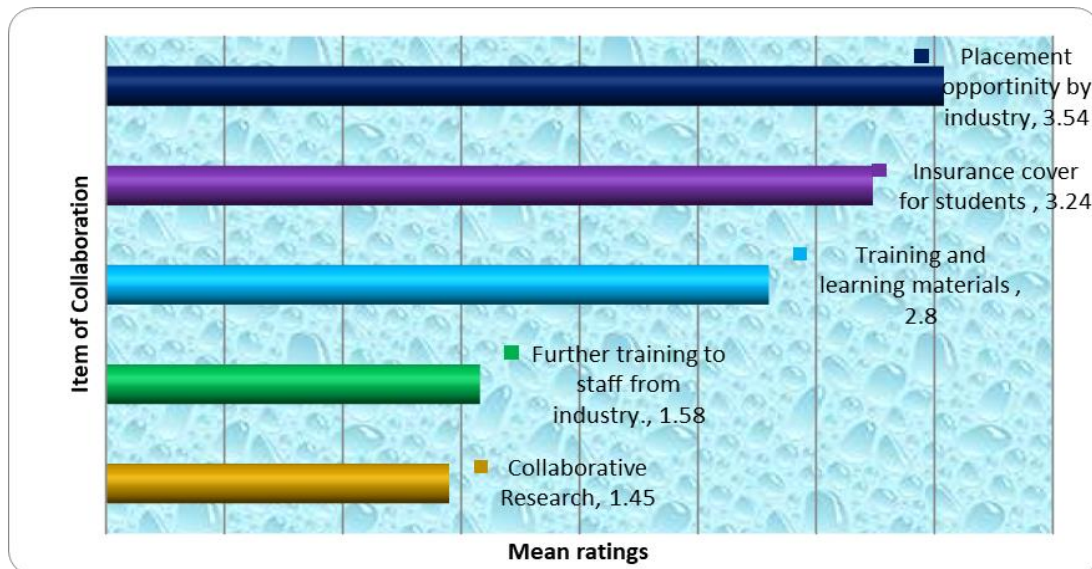
As indicated in Table 4.5, the ability to exhibit team work got a mean of, before the IAP 2.19 and 2.75 after the IAP. The P-value found was  $0.000 < 0.05$  at 5% level of significance. These findings give an impression that IAP may have contributed significantly to students ability to exhibit team work. Social skills are essential to enable workers collaborate with and motivate others in a team and manage client relations. These results confirm with the findings advanced by Campbell, Harrington and Verenikina (2009), that professional culture and attitude are predominantly formed in the earlier interactions that an emerging professional has with his/her career. Armstrong (2006) argues that team building can only be fostered if jobs are defined and roles described in a way that can facilitate and underline the importance

of teamwork. He adds that the importance of teamwork is that it allows flexibility and is responsive to changing events and demands. Individuals in a team can adjust their approaches to new information and challenges with great speed, accuracy and effectiveness than can an individual.

In summary, the findings agree with Bagnall (1998) who argues that, IAP should have a component of ethics education to focus on the development of critical capacities of the mind and intuition to exercise moral courage in response to challenges of the work place. Woods, (1985) adds that potential future employees are expected to think critically and creatively, share thoughts and opinions, use good judgment, and make decisions. It can be concluded that IAP gave good opportunity to students to relate theoretical knowledge to practice, and gave students idea of industrial management and that generally attachés are keen to contribute to the organization.

#### **4.6 Forms of Collaboration between TVET and Industry**

The fourth objective of the study was to examine the various forms of collaboration between TVET institutes and industry/employers. This was considered important in ensuring that objectives of the IAP are met since students find their placement in the industry. The strength of this institute-industry relationship was considered a major pillar in ensuring the success of IAP. Forms of collaboration were grouped into five areas. These were; provision of placement opportunity by industry, provision of training and learning materials to institutions by industry, training institutions provide further training to staff from industry, Industry providing insurance cover for students on IAP and existence of collaborative research between training institutions and the industry. The figure below shows the mean ratings of lecturers who responded to this question.

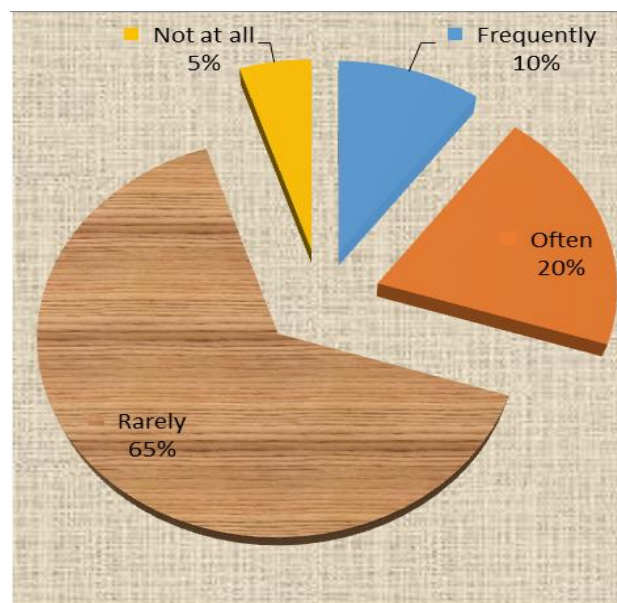


**Figure 4.2: Forms of Collaboration**  
**Source: Researcher's computation (2019)**

From Figure 4.2, it was observed that respondents ranked placement opportunity by industry with the highest mean of 3.54 and this was closely followed by insurance cover for students with a mean of 3.24. Collaborative Research was ranked as the least with a mean rating of 1.45. It appears that training institutions generally have a more visible form of collaboration through industrial attachment. It's however expected that there should be deeper partnerships between training intuitions and industry in terms of collaborative research for the fact that they offer practical oriented courses. This is not however the case.

This confirms the recommendation of Sessional Paper No. 1 of 2005 that training institutions must strengthen the level of collaboration with industry for meaningful education to take place. Hernes and Martin (2013) observe that University-institute partnership, though a new phenomenon, covers a wide range of diverse realities from the more traditional, such as placement schemes, staff exchanges, consultancy services, continuing professional development, joint research and development, to the recent areas such as small enterprises development-the creation of spin offs for the

joint commercialization of Research and Design for collaborative research at the national and international level. TVET institutions are yet to realize the strong partnership with industry in a more dynamic way. Perhaps this explains why often time's student will spend a lot of time looking for placement places in the industry/firms. This is reinforced by the fact that managers who are expected to be the key link persons between the industry and the institute rarely visit industry. The visits by TVET managers was seen as another pillar that strengthens institute-industry relation and enhances student placement



**Figure 4.3: Visit by TVET Managers in the Industry.**  
**Source: Researcher's computation (2019)**

From Figure 4.3, the researcher sought to find out whether the visits by lecturers and managers in TVET institutions were frequent. The response indicated that 10% said frequently, 15% said often, 70% said rarely and 5% said not at all. This clearly indicates that managers of training institutions should strengthen communication and industrial visits if ever attachment has to be effective. Trainers need to be facilitated by a managerial and administrative system that is designed to foster improved learning outcomes. There is evidence to show that there is very little demand by

managers of institutions for accountability from trainers for outcomes from field attachment (UNESCO, 2006). The argument that industrial visits are seen as unnecessary does not indicate that they are not important (Donkor *et al*, 2009).

#### **4.6.1 Enhancing Industry-Institute Interaction**

On the question as to how the industry-institute interaction can be enhanced, the following suggestions were made by respondents from questionnaires and the interview schedule; Training institution should give token reward to firms that host student on attachment as a way of encouraging industry to continue absorbing most students for attachment. Industrial visits by TVET managers should be enhanced and it was noted that, another way of increasing industry-institute partnership was to give managers first-hand experience on the happenings in the industry and get unbiased information about the progress of students in the field. The researcher also noted the need for joint research between training institutions and the industry on specific projects or assignments. This form of training increases the bond between institutions and the industry which is healthy for academic and economic excellence. It was further observed that industry should support the activities of TVET like games and sports and increase corporate social responsibility to training institutions and the community located near these institutions. Lastly industry should continue providing opportunities and avenues for employment to TVET graduates.

These findings show that relations of TVET institutions with the socioeconomic environment depend however widely on the particular dynamism of certain individuals, often teaching personnel with working experience and personal contact with the formation of policy priorities, but also top level management support which is necessary to back up academic department (Martin, 2000). Even if there is no collaborative programmes and activities conducted by industry and institutions, its



often necessary as part of the sensitization strategy to inform potential enterprises that the tertiary education establishment has interesting things to offer (Martin, 2000). Further management should acknowledge certain density of informal relations with industry and advance a policy objective to institutionalize and foster such relations. There should be flexibility necessary to tackle this dynamism (Hernes and Martin, 2013)

The study further sought to establish from respondents, who were lecturers, to what extent they believed the interaction with industry was strong. The Table 4.6 below shows the responses from respondents on the various items relating to institute - industry relationship.

**Table 4.6 Summary of Industry-Institute Interaction**

		<b>GE</b>	<b>SE</b>	<b>L</b>	<b>VN</b>
<b>Item of interaction</b>		<b>Percentages</b>			
<b>1.</b>	Training institutions have good cooperation with workplace supervisors.	59.9	24.7	9.9	<b>5</b>
<b>2.</b>	There is sufficient interaction between workplace supervisors and lecturers to ensure quality student training.	19.8	40.1	19.8	<b>10</b>
<b>3.</b>	There is no mechanism to promote interaction of training institutions with the industry.	69.7	19.7	9.8	<b>0</b>
<b>4.</b>	Lecturers do not make individual initiative to promote industry-institute linkage.	74.6	20	5	<b>0</b>
<b>5.</b>	There is regular exposure of lecturers to industry.	5	24.7	54.9	<b>14.8</b>
<b>6.</b>	Training institutions provide opportunity for lecturers to meet staff from industry.	0	10	70	<b>20</b>
<b>7.</b>	<b>The institute management supports industry-institute linkage.</b>	<b>5</b>	<b>14.8</b>	<b>59.9</b>	<b>19.8</b>

**Source: Researcher's Compilation (2019)**

From Table 4.6, on the question whether training institutions secure good cooperation with workplace supervisors in the industry, 97(59.9%) said to great extent, 40(24.7%) said to some extent 16(9.9%) said little while 9(5%) said virtually nothing. On the question whether there is sufficient interaction between workplace supervisors and lecturers to ensure quality student training, 32(19.8%) said to a great extent, 65(40.1%) said to some extent, 32(19.8%) said little and 24(14.8%) said virtually nothing. on the question whether there no mechanism to promote interaction between industry and training institutions, 119(69.70%) said to a great extent, 32(19.7%) said to some extent, 16(9.8%) said little extent. On the question whether lecturers make individual initiative to promote industry-institute linkages, 121(74.6%) said to a great extent, 20% said to some extent, and 5% said little. There was zero response for virtually nothing. On the question whether there was regular exposure of lecturers to industry, 9(5%) said to a great extent, 40(24.7%) said to some extent, 89(54.9%) said little extent while 24(14.8%) said virtually nothing. On the question whether institute management supports industry-institute linkage, 9(5%) said to a great extent, 24(14.8%) said to some extent, 97(59.9%) said little and 32(19.8%) said virtually.

In an interview, the researcher asked workplace supervisors how IAP was important in creating a linkage between student, TVET and industry. One workplace supervisor said that IAP clearly creates a link between the training institutions and the industry; in fact it is the main partnership between the industry and the training institutions. In this partnership, the industry benefit from the labour that the students offer while the students benefit from the experience that the industry offers. These findings contradict those of Martin (2001) who argues that TVET institutions and industry pursue different objectives and face different time constraints. There are different time

horizons for research outputs; short and definite in case of industry; long and indefinite and flexible in the case of academic staff.

Industry strives to benefit from practical exploitation of results and optimum testing whereas university staff seeks for knowledge, new theories and thoroughness. More so the private sector generally prefers confidentiality in terms of research results, whereas university seeks to publish. Even if collaboration between training institutions with industry is enhanced, there is indeed a dichotomy between the academic and the industry sphere to the detriment of the students' learning. Additionally, (Altbach, 2009) confirms that tertiary institutions worldwide cannot develop research capacity in all fields and disciplines. Few manage to marshal the human and financial resources to lead engagement in research.

#### **4.7 Challenges of Industrial Attachment Program**

This section sought to establish the challenges of IAP. The findings hoped to get the link between student's ability to meet the IAP objectives and other factors that were seen as a major drawback to the attainment of the same. The table below shows the mean ratings by lecturers and students and the t-test results to establish whether the challenges were real.

**Table 4.7: Ratings of students and lecturers on challenges of IAP**

<b>Item of challenge</b>	<b>Mean Rating Lecturers</b>	<b>Mean Rating Students</b>	<b>t value</b>	<b>Sig. (2-tailed)</b>	<b>Interpretation</b>
<b>Item 1</b> Placement of students is sometimes not in line with area of study	3.2037	2.9815	1.444	0.151	The mean ratings of lecturers and students are not significantly different. Appropriate placement is not a real challenge in IAP.
<b>Item 2</b> Students take a longer period in finding placement places	3.5819	3.3148	2.537	0.012	There is a significant difference in the ratings by lecturers and students. The challenge of students taking longer period to find placement is real
<b>Item 3</b> The financing of IAP is poor	3.6936	3.7469	1.856	0.045	There is a significant difference in the ratings by lecturers and students on financing of IAP. Financing was seen as a real challenge.
<b>Item 4</b> Students lack free access to machines and equipment	3.3074	3.1235	1.773	0.048	The lack of free access to machines and equipment by students on attachment is real
<b>Item 5</b> Some students are harassed by lecturers and workplace supervisors	2.6667	2.142	4.203	0.0205	There is no significant difference in the ratings by lecturers and students. Harassment by lecturer and students is not a real challenge
<b>Item 6</b> Poor professional ethics is displayed by some attaches	3.5062	2.5123	6.926	0.000	There is a significant difference in the ratings by lecturers and students. Respondents agreed that some students on attachment did not measure up to the required professional conduct. This was a real challenge
<b>Item 7</b> Workplace supervisors do not display high professionalism in	2.8667	2.9351	0.739	0.461	The challenge that some workplace supervisors do not display high professionalism is not real.

mentoring attaches						
<b>Item 8</b>	Attaching organization do not conduct good induction program for attaches	3.395	3.4617	2.877	0.08	There is no significant difference in the ratings by lecturers and students. Conducting good induction is not real challenge.
		1		5		
<b>Item 9</b>	Negative organizational culture affects attaches' work ethics social and social skill	2.345	2.8272	4.304	0.00	There is a significant difference in the ratings by lecturers and students. Organizational culture indeed can be a major challenge affecting a student's social skills and work ethics
		7		0		

**Source: Researcher's Compilation (2019)**

As tabulated in Table 4.7, above, the item of challenge related to financing of IAP had the highest mean score (lecturers = 3.6936 and students rating =3.74690. Of the nine items dealing with the challenges of the programme that were presented to lecturers and students, the study established five to be real. These included; Students taking a longer period in finding placement places, Poor professional ethics displayed by some students, attachés lack free access to machines and equipment, financing of IAP is poor and lastly negative organizational culture.

#### **4.7.1 Students Taking a Longer Period in Finding Placement Places**

From the findings of the study, lecturer's mean rating and students mean ratings for students finding attachment places was recorded as 3.5819 and 3.3148 respectively with p-value of .0012. This challenge may be an indicator that perhaps courses offered by training institutions are not in high demand in the industry and that is why students take longer period to be attached. It may also imply that there seems to be a

disconnection between training institutions and the industry in terms of collaboration and linkages. This confirms why most student respondents said that they were assisted mostly by their relatives and friends in getting attachment places. Apparently there seems to be a feeling among trainees that training institutions don't play a significant role in assisting students gets attached in the industry. More importantly, delays in getting placement places disorient learners who do not get maximum benefits of the IAP. The findings indicate that placement for industrial work experience is problematic, and given the importance of employers in work based learning, it is difficult to imagine how successful programs can function without the support of employers (Afonja *et al*, 2005; Coll *et al.*, 2002). The assertion that Uddin, (2013) confirms that for effective placement of students on attachment, training institutions have to prepare industries to take on students for practical work and that they must enter into partnerships with relevant organizations and companies.

#### **4.7.2 Professional Ethics Displayed by Students**

The mean ratings by lecturers and students for this item were 3.5062 and 2.5123 respectively. Poor professional ethics displayed by some attaches was noted with concern. One of the workplace supervisor said that sometimes they have been forced to send off students from attachment due to their behaviour and dressing code. The researcher also established that, uniquely, older supervisors had a major problem with students concerning the dressing code as compared to younger supervisors. Perhaps the change from a school environment to a work based environment may contribute to poor professionalism by students on attachment. This boils down to the training system which has to be geared towards producing future employees and not merely graduates with academic qualification. The findings agree with Smith, (2010) and Patrick & Crebert, (2004) who argue that training should aim at ensuring students

gain and apply knowledge, skills and feelings in an immediate relevant setting or working environment. Further, argue that students engaged in work based learning interpret their experience through the lens of prior experiences such as family environment, cultural context, social surroundings, and educational settings. This lens includes already shaped value structures and moralities that are further developed and reinterpreted through their experience in the work place Billet (2006) and Campbell, (2009). However, its worthwhile statement to note that students entering a workplace are limited in their professional knowledge and as such still forming their professional identity within their profession.

#### **4.7.3 Attachés Lack Free Access to Machines and Equipment**

Students' lack of free access to machines and equipment posed a real challenge. The mean rating by lecturers and students was 3.3074 and 3.1235 respectively. The lack of exposure to machines clearly indicates the competing goals between training institutions and the industry. Whereas training institutions are after dissemination of knowledge, industry's major goal is to maximize on profits. Profit maximization can only be realized if equipment and machines are being used by individuals who are well experienced and can maximize on time. Students are often seen to be less experienced and lack exposure and therefore cannot be entrusted with such costly and complicated machines some of which they have only heard about or read in books. This finding concurs with Bertrand (2004) and Donkor *et al* (2009) that sometimes firm/industry is reluctant to grant free access of their machines and equipment for fear of damage due to improper usage, accidents and possible decrease of productivity. On the contrary, Dewey (1938) argued that training institutions are not mere adjuncts to industry or students a human means to material means, on the contrary, they should provide learners with critical spirit and intellectual capacity to transform an industrial

and educational structure. (Foley, 2004) recommends that hands on experience help practitioners to act, reflect on the action and learn from the reflection. This is the essence of an industrial attachment programme.

#### **4.7.4 Negative organizational culture affects attachés work ethics social and social skill**

Organizational culture posed as a real challenge on attachees work ethics, social and social skill. The mean ratings for lecturers and students were 2.3457 and 2.8272 respectively with a p-value of 0.000 at 0.05 significance level. This finding perhaps is an eye opener to TVET intuitions to always establish the reputation of firms/industries before attaching student in these firms. Within the context of industrial experience, there exist significant differences in positions of power between students and these in the workplace when it comes to encouraging students to actively critique the conduct of those around them. Whereas most organization champion for best practices among its employees, emerging professionals are faced with a tough choice of being agents of positive change as they get initiated into their profession. Attaching organizations have a role to develop the critical capacity of students who should be able to interrogate their settings and experiences and identify important work ethics. Students have to withstand the temptation of being passive and having the inability to affect change while at the same time give a critical thought to any form of compliance that does not allow innovation and the general acceptance that this is the way things are done in certain places.

Since behavioural change is seen as one of the major fruits of an effective IAP within the context of increasing youth employability in the labour market (Campbell and Zegwaard, 2011), there is need for articulated relationship between espoused values within the discourse of the academic and workplace settings. They add that IAP needs



to include education and training around professional ethics of which a primary focus must be the development of a critical mind with acknowledgement of the social and cultural contexts of the practice. Further a keen eye should focus on teachers' performance. Koh and Luke, (2009) observe that professional development improves the capacities of teachers. The study found that teachers who undergo tailor made courses are able to better make use of the programme input in designing high quality classroom "assessment tasks" and in using reliable and valid "scoring rubrics" for assessing student work. They contend that a sustained, on-going professional development is achievable and essential. Professional ethics has to be well established within the training institutions to ensure that they produce well proven workforce that has a moral drive. Sinclair (1993) asserts that managers view the organizational culture as both a source of problems as well as the basis for solutions, and therefore use the culture to devise organizational changes.

#### **4.7.5 Low Financing of IAP**

The mean ratings by lecturers and students on this item were 3.6936 and 3.7469 respectively with a p value of 0.045 at 0.05 level of significance. From the study, it was observed that most students had major financial challenges in getting accommodation and transport. Few were lucky to have lunch provided by respective attaching organization. Perhaps this explains why some students do not arrive on time because they have to walk to their places of work. Training institutions have a challenge of looking at ways and means of ensuring that students get financial assistance during IAP. Further, the lack of sufficient financing explains perhaps why IAP is not 10% attended by students. The same reason could explain why some students are not assessed by lecturers and that a majority of students are assessed only once. Strong financial base is a prerequisite condition for partnerships between

training institutions and the industry. UNESCO, 2012 asserts that training institutions are trying to establish a sustainable assessment system, including the stability of funding sources, capacity building in management and technical skills, institutionalization of monitoring systems and dissemination and use of assessment results. Poor financing has been another source of low capacity building among instructors in training institutions and inability to monitor educational processes and the outcomes. Third International Congress on Technical and Vocational Education and Training in Shanghai, China, in May, 2012 recognized TVET as an investment in human capital that produces a high return benefiting a broad range of actors including individuals, enterprises and the state, and give it high priority and further recommended diversification on sources of funding by involving all stakeholders, in particular through the use of appropriate incentive mechanisms (UNESCO, 2012).

Surprising, the mean ratings by lecturers and students showed that there was no real challenge in the following areas; placement of students sometimes not in line with area of study, some students on attachment being harassed by lecturers and workplace supervisors and workplace supervisors not displaying high professionalism in mentoring attaches. The findings however, contradicts with Martin (2000) who argues that work based learning is often badly supervised by untrained mentor in the industry and often not followed up by the academic staff who are usually more concerned with theoretical teaching than with practical application of knowledge.

In conclusion, training institutions have to mitigate the challenges relating to placement and supervisory capacity and the face of deteriorating public enterprise input on work based learning.

#### **4.8 Chapter Summary**

This chapter entailed data presentation, analysis, and interpretations as based on the research objectives.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Overview**

The chapter outlines the summary of findings, conclusions and recommendations based on the research findings.

#### **5.2 Summary of Findings**

The findings from the study were summarized as below:-

##### **5.2.1 Demographic Profile of Lecturers and Students**

The findings revealed that most lecturers in TVET institutions had served for a period of more than 5 years. However, a majority of them had not undergone any form of training or industrial attachment to enable them to keep abreast with the latest trends in the industry. Further, a majority had not attended any workshops/seminars on matters related to industrial attachment. This was considered an important aspect during the evaluation of students on attachment. A majority of lecturers had worked for a considerable period of time and were considered experienced enough to make any worthwhile assessment on industrial attachment programme.

The study also revealed that most students participated in the industrial attachment programme although few did not attend the IAP. Some students did not attend the programme because there were no available places in the industry while others were faced with financial challenges. Further, few students felt that they had been attached in the wrong place that was not in line with their area of specialization. This is a wakeup call for TVET institutions to ensure that all students who qualify to undergo the IAP actually participate in it. It was also noted that the assessment of students by lecturers was quite impressive although not all students were assessed. Some of the

reasons given for lack of assessment boiled down to poor planning and low financing given to the ILO office for a smooth implementation of the programme.

### **5.2.2 The effect of IAP on student's ability to demonstrate problem solving skills**

The second objective was to establish the effect of IAP on students' ability to demonstrate problem solving skills. The findings on whether students were able to demonstrate problem solving skills indicate that IAP enables majority of students to demonstrate problem solving skills and to a great extent this objective has been met.

The development of skills among students facilitates sensitivity to act in an informed manner. However, problem solving ability depends on intellectual ability and their interests in being engaged in real life work environment. Further, students should not just be mere acquirers of knowledge but rather develop a critical mind-set in shaping their trade and area of specialization. IAP enhances students' academic knowledge, cognitive abilities and technical skills.

The industrial attachment programme enables student develop skills in; sorting out the relevant data to solve the problem, prioritize the problems and contributes to group problem solving. However, there was no real evidence to show how the programme assist students in identifying problems related to their daily tasks and identifying essential components of the problem. The absence of these skills after the IAP would imply that students had already acquired these skills and therefore felt that they had not gained much in this area.

It may be noted that training institutions give more emphasis on work done by students while employers in the industry are particularly interested in the soft skill by employees. However, one cannot separate work done and personal attributes; the two are intertwined. Students should be all round in readiness for the world of work.

### **5.2.3 The influence of IAP on students' ability to exhibit appropriate attitude and social skills**

The second objective of the study was to evaluate the effect of IAP on students' ability to exhibit appropriate attitude and social skills. The findings from the study showed that students particularly should understand and navigate the increasingly important ethical aspects of being professional and strive to have a professional identification. This is what the employer looks for in a prospective employee. Skills in taking reasonable job-related risks, working independently, conflict resolutions, adaptation to situation of change, response to constructive criticism and working under stressful condition are considered essential in the eyes of potential employers. The desire by employers for employees to demonstrate a positive work attitude and social skills cannot be gain said.

The study established that IAP experience enabled students to work independently. Students were able to internalize concepts and ideas in the workplace setting with a relatively high degree of independence which is an indication that they had gained knowledge. Possession of appropriate attitude was closely linked to students' ability to respond positively to constructive criticism. Most attaches were able to respond positively to constructive criticism because of the fact that they were in a learning environment and needed to get as much information as possible. Workplace supervisors provided the right mentorship although some attaches seemed to work on their own because of absence by some workplace supervisors.

Students reported a remarkable improvement on adaptation to change. Work environments are constantly changing and therefore ability to adapt to situation of change is an essential competence. Most organizations subject attaches to various skills in various departments to be able to get a real feel of the work organization.

This requires skills of adaption by meeting different supervisors and employees. Students were able to exhibit social skills of creating and maintain relationships that were essential for better performance while on attachment.

The study established that stress management is an essential skill that students must possess. The workplace environment provided a myriad of challenges on students especially touching on finances. IAP experiences enabled students to be focused on their key function of doing what was expected of them while sorting out their personal challenges.

Time management was considered a key factor by hosting organization and as such most students proved that they were able to meet their deadlines and work plans. In conclusion, IAP experience strengthened student's ability to demonstrate appropriate attitude and social skills. Students exposed to real working environments give them an understanding of the kind of profession they have chosen and are likely to develop a positive attitude about it. Most importantly, they are likely to develop social skills of networking and relationships that can help them advance their careers.

#### **5.2.4 The influence of IAP on students' ability to exhibit work ethics and culture**

The third objective was to assess the effect on students' ability to exhibit work ethics and culture and the findings under this objective are outlined below.

The study found out that work ethics and culture plays a significant role in the attainment of IAP objectives. Work ethics forms a major part of work performance in any organization. Although most students found it difficult to initially adjust to the organizational culture, it was established that most of them were able to catch up with the organization's culture in the long run. Further, the gap between students' generic

skill levels and employer expectations illustrates the need for greater emphasis on generic skills on the curriculum to prepare students for graduate employment.

The study revealed that communication skills by students were ranked the least hence training institutions should emphasize good communication skills amongst learners because the success of a TVET training system should endeavour to produce graduates who not only are technically competent but morally sound and pleasing in the eyes of their future employers. Students are expected upon graduation to exhibit cordial relationship with fellow workers, listen attentively, team work, relate well with supervisors and establish good rapport with subordinates.

#### **5.2.5 Forms of collaboration between training institutions and the industry/employers**

The fourth objective was to determine the forms of collaboration that exist between training institution and the industry.

The study established that there exist some forms of collaboration between training institutions and the industry. These forms of collaboration included; Industry providing opportunity for students to get placement during IAP and giving training and learning materials to training institutions and that they provide insurance cover for students on IAP, and take students on academic trips to the industry and the training institutions on the other hand provide further training to staff from industry.

The study revealed that respondents ranked placement opportunity by industry as the most common form of collaboration between training intuitions and the industry. This was followed by provision of insurance cover to students on attachment by industry/insurance companies. Other forms of collaboration like collaborative research between training institutions and the industry and further training of industry



staff by training institutions received a low score by respondents. Clearly, this shows that the kind of collaborations between training institutions and the industry is not symmetrically symbiotic in nature. This explains why industry feels they have an upper hand and cannot be seen as equal partners with training institutions in provision of education and training. Sadly, it appears that training institutions will be seen as the underdog if they will change this kind of collaboration into a strategic partnership. Strategic partnership will imply that training institution will have to be more proactive and engage into meaningful partnership with industry that is aimed at strengthening their core business of training and teaching.

The study also established that industrial visit by managers of TVET institutions exist but on rare occasions. This confirms why there is a weak link between training institutions and the industry and why students take a longer period finding placement places in the industry. Further, lecturers spend inadequate time with workplace supervisors while on visits. This shows that lecturers do not make individual initiative to promote industry-institute linkage and have irregular exposure to industry and therefore not exposed to what happens in the industry. The resulting effect is the persistent skill gap that continues to grow wide day by day between training institutions and the industry.

The study found out that industry-institute interaction can be enhanced through the following ways; Training institution should give token reward to firms that host student on attachment, TVET managers should increase industry visits, Joint research between training institutions and the industry should be encouraged and facilitated, Industry should support the activities of TVET such as games and sports, industry could sponsor high academic achievers in training institutions, Industry should

provide opportunities and avenues for employment to TVET graduates, training institutions should continue offering further training to employees from industry, and Industry should increase cooperate social responsibility to training institutions. Industry-institute linkage should be strengthened to ensure quality training. In addition, there should be a well-planned mechanism to promote interaction of training institutions with the industry and that institute management should support industry-institute linkage.

### **5.2.6 Challenges of Industrial Attachment Programme**

The fourth objective was to establish the challenges that the IAP was facing. The study findings show that there were a number of challenges faced by IAP in training institutions and they included; time of assessment, long period of getting placement opportunities, insufficient funding and weak institute-industry relationship. There were however, other challenges that students faced which were deemed not real and were imaginary as per the findings.

Financial challenges ranked as the biggest challenge and although most students were anxious to be assessed by lecturers, their discipline at the place of work required reinforcement from the college administration. On the other hand workplace supervisors felt that lecturers lacked the competence and skill and in fact needed to update themselves on the new trends in the industry in order to effectively assess students attached in these firms.

The findings also showed that other challenges included: students inability or free access to machines and equipment to work with, placement of students on I.A.P sometimes is not in line with the student's area of study, there is low level of

interaction between lecturers and workplace supervisors and demand for placement opportunities is more than the supply capacity of firms/industry.

The study found out that the assessment of students by lecturers is usually faced with time constraints. Lecturers do not spend adequate time in assessing students on attachment while on visits. The interview from industrial liaison officers revealed that most lecturers had limited financial facilitation and as a result most of them would work hard to ensure that assessment was done on a single day. Some lecturers were to assess more than ten students in a single day because the funds given to them could not sustain them for more than a single day. As such, they did not have adequate time to talk to students while on visits and give guidance appropriately.

Further, the findings indicate that there was delay in getting opportunity for placement among students. These delays were occasioned by limited placement opportunities in the industry and that students lacked assistance from training institutions to secure placement. This delay meant that attaches would take a shorter period than the recommended three months. Obviously this has a negative impact on the skill level gained as at the end of the attachment period.

The study also found out that attaché's faced some challenges from supervisors. Some workplace supervisors were impatient and careless about the progress of attachés and therefore did not provide the right mentorship to students. Further still, some students did not have free access to machines and equipment to work with because of fear of damages. Immediate supervisors felt that students were not experienced enough to handle machines and yet still in some rare occasion, workplace supervisors are not always available to assist attachés.

The study found out that IAP faced a number of financial challenges. These ranged from difficulty in students financing for their daily upkeep and delay in submission of final report due to cost involved in its preparation. There was also a remarkable delay and poor time schedule for assessment by institution's supervisors due to delayed facilitation. Institutional supervisors were also given so many attaches to assess with limited funding. This resulted into hasty assessment that does not give lecturers opportunity to create and develop any collaboration or network with the hosting institutions. Finance plays a critical role in the attainment of IAP objectives. Perhaps institutions should think of offering bursary for students going out for attachment programme. Although higher education institutions frequently suffer from lower public and private spending on research and development especially among developing countries effort that promote equity should be encouraged.

Lastly, the study established that there exists a noticeable weak industry-institute relationship. This accounts for the reasons why some students take longer period in finding attachment places in the industry. Training systems should respond to the demands of the labour market, while at the same time help citizens achieve skills required for work and for lifelong learning. Stronger ties between training institutions and the industry will ensure that the labour force produced by training institutions meets the ever more stringent national and international qualification requirements. It is noteworthy saying that industry usually put a high premium on time management largely due to the fact that they are a profit making enterprise. Industry is after profit while training institutions are after generation and dissemination of knowledge. There has to be a balance between the two.

### **5.3 Conclusions**

Based on the findings of the study, it can be concluded that in regard to the first objective, IAP fosters the development of critical mind-sets that promotes generation of knowledge and sharpens cognitive skills among students. Secondly, students were able to demonstrate problem solving skills because of the technical skills they had acquired while on attachment. Training should place strong emphasis on the need for students to exhibit appropriate attitude and social skills. It is suffice to say that Industrial attachment did provide a good opportunity for students to relate theory to practice and therefore gave them problem solving skills. Students need to improve on their professional attitude and strengthen their networking skills in order to advance in their careers. It has been said that attitude determines altitude and therefore right attitude should be inculcated among students as they pursue their academic goals. Thirdly, the work ethics and culture seems to be evolving over time and therefore, the demand by employers for employees to possess soft skills and a strong work ethics and culture cannot be overemphasized in this modern work environment. In the face of moral decadence, training institutions have to place emphasis on students to possess strong moral values and moral courage to perform and execute their assignment in the right manner. As such, the training environment has to show moral values right from the top management to the classroom environment. In addition, the attachment environment has to promote these moral values where workplace supervisors will demonstrate good mentorship abilities as they initiate young upcoming employee. Fourthly, the training institutions on the other hand have to develop meaningful strategic partnerships with firm/industry in order to sustain high quality training and ensure the relevance of training. Institutional managers should find it worthwhile to encourage staff to collaborate with industry in joint researches

and other meaningful partnerships. These kinds of partnerships could also offer job opportunities for TVET graduates and further expose lecturers to industry on modern trends. Finally, IAP faces a myriad of challenges; training institutions face financial challenges on funding of IAP, have weak institute-industry relationship, have students who often take a longer period to get attachment places and have trainers who have not been fully exposed to the modern trends in the industry/workplace. These challenges however can be overcome.

#### **5.4 Recommendations**

Based on conclusions from the study, the researcher came up with the following recommendations:

##### **5.4.1 Policy recommendations**

Training in TVET institutions has to ensure that students develop critical mind-sets that can foster problem solving abilities among students. Students have to be exposed to various learning environments that promote the development of academic knowledge, cognitive skills and technical skills that enable them fit into the required employment standards.

Lecturers should have regular exposure to the industry in order to update themselves with the current trends in the industry. This can be achieved through a well-designed staff exchange programme with the relevant industry.

##### **5.4.2 Practice recommendations**

The requirement by industry for employee to possess generic skills which seem to have equal rating by some employers gives a strong suggestion that the TVET training has to have component training in soft skills. Training has to emphasize the

need for positive professional attitude and strengthen social networking skills among students. This can be enriched in the curriculum.

Enhancement of optimal participation of students on IAP, the ILOs and TVET managers have to continue strengthening the relationship between training institutions and hosting organizations and therefore, institutions have to play a proactive role in assisting students to get attachment places.

Industry-institute relationship should be strengthened. Meaningful strategic partnerships between training institutions and the industry should be established to ensure that quality training is enhanced. This could be in the form of; TVET institutions providing regular interaction between staff and industry, increasing exposure of staff to the industry, incentivise lecturers to make individual initiatives to promote institute-industry linkages. In addition, a collaboration that focuses on the core functions of training institutions of teaching and training should be encouraged. Action research and other joint researches between training institutions and the industry should be encouraged. Further training institutions should give token reward for hosting firms in order to cement the relationship and by TVET managers visiting these firms/industries.

#### **5.4.3 Future Recommendations**

Training institutions should increase the funding of IAP to ensure that students participate fully and comfortably in the programme. The government can offer bursary schemes to needy students who cannot meet their accommodation costs while on attachment. Training intuitions on the other hand should facilitate institutional supervisors in time to ensure that attaches are adequately assessed.

### **5.5 Suggestions for Further Study**

- i. Since labour requirements are rapidly changing, a study should be done on the emerging trends in collaborative and linkage programmes between training institutions and the industry.
- ii. The success of IAP depends on the institute-industry relationship. As such, a study should be carried out on factors that hinder or promote this partnership.
- iii. To ensure that training institutions offer market oriented and relevant courses, a study should be done on matching skill supply and demand using the IAP experience.
- iv. A study should be done on organizational issues that surround IAP.
- v. A study should be done on benefits of industrial attachment programme



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### Sample Question

		Before attachment					After attachment				
ITEM		4	3	2	1	0	4	3	2	1	0
<b>(a) This section seeks to establish students' ability to exhibit appropriate attitudes and social skills. through;</b>											
1	Team building	5	4	3	2	1	1	2	3	4	5

On the above item, the respondent perceived to a great extent skill in team building before the industrial attachment programme and little after the industrial attachment programme

		Before Attachment					After Attachment				
ITEM		4	3	2	1	0	4	3	2	1	0
<b>(b) This section seeks to establish to what extent students are able to demonstrate problem solving skills. Kindly indicate your response in the various competencies.</b>		4	3	2	1	0	4	3	2	1	0
5.	To what extent were you able to identify problems related to my tasks	4	3	2	1	0	4	3	2	1	0
6.	To what extent were you able identify essential components of the problem	4	3	2	1	0	4	3	2	1	0
7.	To what extent were you able to sort out the	4	3	2	1	0	4	3	2	1	0



	relevant data to solve the problem											
8.	To what extent were you able to prioritize the problems	4	3	2	1	0	4	3	2	1	0	
9.	I was able to solving the problem	4	3	2	1	0	4	3	2	1	0	
10	To what extent were you able to contribute to group problem solving	4	3	2	1	0	4	3	2	1	0	
<b>(b) Students are able to demonstrate practical competence and problem solving skills in specific situation</b>			4	3	2	1	0	4	3	2	1	
11	To what extent were you able to make decisions at a short time period	4	3	2	1	0	4	3	2	1	0	
12	I had knowledge of ethical implication of decision made	4	3	2	1	0	4	3	2	1	0	
13	To what extent were you able to establish critical events to be completed	4	3	2	1	0	4	3	2	1	0	
14	To what extent were you able to monitor progress against work plans	4	3	2	1	0	4	3	2	1	0	
15	To what extent were you able to allocate time efficiently	4	3	2	1	0	4	3	2	1	0	
16	To what extent were you able to set priorities	4	3	2	1	0	4	3	2	1	0	
<b>(c) This section seeks to</b>			4	3	2	1	0	4	3	2	1	

<b>establish students' ability to exhibit appropriate attitudes and social skills by</b>											
17	To what extent were you able to take reasonable job-related risks	4	3	2	1	0	4	3	2	1	0
18	To what extent were you able to work independently	4	3	2	1	0	4	3	2	1	0
19	To what extent were you able to Solve work related conflicts	4	3	2	1	0	4	3	2	1	0
20	I was able to adapt to situation of change	4	3	2	1	0	4	3	2	1	0
21	To what extent were you able to respond positively to constructive criticism	4	3	2	1	0	4	3	2	1	0
22	To what extent were you able to function well in stressful conditions	4	3	2	1	0	4	3	2	1	0
<b>(c) This section seeks to establish students' ability to practice appropriate work ethics and culture by;</b>			4	3	2	1	0	4	3	2	1
23	To what extent were you able to work well with fellow employees	4	3	2	1	0	4	3	2	1	0
24	To what extent were you able to relate well with my supervisors	4	3	2	1	0	4	3	2	1	0
25	To what extent were you able to listen attentively	4	3	2	1	0	4	3	2	1	0
26	To what extent were you	4	3	2	1	0	4	3	2	1	0

	able to establish good rapport with my subordinates											
27	To what extent were you able to exhibit communication skills	4	3	2	1	0	4	3	2	1	0	
28	To what extent were you able to exhibit team work	4	3	2	1	0	4	3	2	1	0	

### Section D: Interaction with Industry

This section seeks to find out the extent you perceive interaction with other stakeholders is adequate. Please put a check in the appropriate cell that most adequately reflects your views in relation to the given statement.

29. How often do managers in technical institutions visit the industry?

Frequently [ ]      Often [ ]      Rarely [ ]      Not at all [ ]

30. What forms of collaboration exist between training institutions and the industry?

- a) Industry provide opportunity for students to get placement during IAP
- b) Industry provides training and learning materials to institutions
- c) Training institutions provide further training to staff from industry.
- d) Industry provides insurance cover for students on IAP
- e) Collaborative research between training institutions and the industry

31. In what way can training institutions increase collaboration with industry?

- a. Training institution should give token reward to firms that host students on attachment.
- b. TVET managers should Increase industry visits.
- c. Joint research between training institutions and the industry should be encouraged and facilitated.
- d. Sponsorship of high academic achiever by industry
- e. Industry should provide opportunities and avenues for employment to TVET graduates.
- f. Training institutions should continue offering further training to employees from industry.
- g. Industry should increase cooperate social responsibility to training institutions.

32. What poses a challenge to closer and deeper partnership between training institutions and the industry?

- a. Different goal targets; Industry aim at making profit while training institutions are after disseminating and acquiring knowledge.
- b. Feeling of exploitation; Industry often times takes advantage of cheap labour provided for by institutions during attachment period.
- c. Poor institutional culture by management and/or students.

- d. Lack of a clear policy on training and partnerships between industry and training institutions.

**Section E: Challenges of the Programme.**

This section seeks to find out the extent to which you perceive to be challenges facing the industrial attachment programme. Please, put a check in the appropriate cell that most adequately reflects your view in relation to the given statement.

33. How long do students take to find a place for attachment?

- a. One month before the attachment period. [ ]
- b. Two weeks before the attachment period. [ ]
- c. One week before the attachment period. [ ]
- d. Soon after the attachment programme begins. [ ]

34. If the answer is not 'a' in question above, what were the reason for the delay?(

Tick all that apply)

- a. Accommodation services were not available. [ ]
- b. Lack financial ability for daily upkeep. [ ]
- c. Training institution did not assist students get an attachment place [ ]
- d. Placement opportunities in the places visited were limited. [ ]

35. What are the major challenges faced in the industrial attachment programme?

(Tick all that apply)

- a. Poor time management [ ]
- b. Negative attitude by students [ ]
- c. Harassment by supervisors [ ]
- d. Students unable to adapt to work environment [ ]
- e. Poor industry-institute relationship [ ]
- f. Students spending a lot of money and time in traveling from their homes to the work place [ ]
- g. The placement of students on I.A.P is not in line with the area of study?[ ]

### Summary of challenges of Industrial Attachment Programme

Kindly respond to the following statements. Each statement is rated on a 4 point scale as shown below. **GE**: To a great extent, **SE**: To some extent, **L**: little, **VN**: Virtually nothing

<b>Section F: Challenges of industrial attachment programme.</b>		<b>To a great extent</b>	<b>To some extent</b>	<b>Little</b>	<b>Virtually nothing</b>
3	Training institutions provide sufficient funds for the attachment programme.				
3	Workplace supervisors give accurate assessment of students on industrial attachment.				
3	The industry-institute linkage affects the effectiveness of the attachment programme.				
3	Training institutions secure good cooperation with workplace supervisors in the industry.				
4	The competencies on which students are assessed on the programme are appropriate.				
4	Students are given helpful instructions about the work they do				
4	The management of the firm/industry was very receptive				
4	Students adapted to the work environment				

## Appendix B: Questionnaires for Lecturers

Please respond by ticking in the brackets provided and fill in the blank spaces where necessary.

### Section A: Bio Data of the Respondent.

1. Name of institution .....
2. Name of  
department.....
3. How many times have you assessed students on attachment?  
Once [ ]      Twice [ ]      Three times [ ]      More than three times [ ]
4. Have you ever been attached to an industry?  
No [ ]      Yes [ ]
5. Have you ever attended any workshop/seminar pertaining to industrial attachment?  
No [ ]      Yes [ ]

### Section B: Attainment of Industrial Attachment Objectives.

This section seeks to find out the extent to which you perceive the objectives of industrial attachment programme have been realized. It has four sections and each question has two columns; in the left column, indicate your perceived level of skills gained by students on attachment. The response scale for this column is as follows;

#### Level of skill

5= Very Great Extent

4= Great Extent

3= Some Extent

2= Little

1= Virtually Nothing

In the right column, indicate the medium through which the skill was developed. It includes; 1=Good Work environment, 2= Role by supervisor, 3=Organizational culture and the 4=training institution

**Kindly respond to the following statements. Each statement is rated on a 5 point scale as shown below. SA: Strongly Agree, A: Agree N: Neutral, D: Disagree, SD: Strongly Disagree**

<b>(F)Interaction with Industry</b>		<b>SA</b>	<b>A</b>	<b>N</b>	<b>D</b>	<b>SD</b>
1.	Training institutions have good cooperation with workplace supervisors.					
2.	There is sufficient interaction between workplace supervisors and lecturers to ensure quality student training.					
3.	There is no mechanism to promote interaction of training institutions with the industry.					
4.	Lecturers do not make individual initiative to promote industry-institute linkage.					
5.	There is regular exposure of lecturers to industry.					
6.	Managers of training institutions do not visit industry regularly.					

#### **Summary of challenges of Industrial Attachment Programme**

**Kindly respond to the following statements. Each statement is rated on a 4 point scale as shown below. GE: To a great extent, SE: To some extent, L: little, VN: Virtually nothing**

<b>(G) Challenges of industrial attachment programme.</b>		<b>To a great extent</b>	<b>To some extent</b>	<b>Little</b>	<b>Virtually nothing</b>
7.	Placement of students is sometimes not in line with area of study				
8.	Students take a longer period in finding placement places				
9.	The financing of IAP is poor				
10.	Students lack free access to machines and equipment				
11.	Some students on attachment are harassed by lecturers and workplace				



	supervisors				
12.	Poor professional ethics is displayed by some attaches				
13.	Workplace supervisors do not display high professionalism in mentoring attaches				
14.	Attaching organization do not conduct good induction program for attaches				
15.	Negative organizational culture affects attaches' work ethics social and social skill				

16. What would you recommend as solutions to these challenges?

a. ....

b. ....

c. ....

d. ....

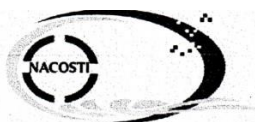
**Appendix C: Interviews for Workplace Supervisors**

1. How does the influence of IAP affect student problem solving skills?
2. How does the IAP help students identify problems related to their tasks?
3. When students finish their IAP are they able to sort out relevant data needed to solve problems?
4. How do the IAP assist students make decisions in a short period of time?
5. How does IAP assist students monitor progress against work plan?
6. How does IAP assist students set their priorities at work?
7. How has IAT led to collaborations between TVET and the industry?
8. What in your opinion is the main challenge facing IAP?

**Appendix D: Interview Schedule for Industrial Liaison Officers**

1. To what extent have TVET institutions succeeded in achieving the objectives of Industrial Attachment Programme?
2. How effective is the supervision and organization of Industrial Attachment Programme by training institutions?
3. What forms of collaboration exists between training institutions and the industry?
4. What are the challenges of industrial attachment programme?
5. How do you make use of the feedback report of students from the industry/attachment?

## Appendix E: Research Authorization Letter From Nacosti



### NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,  
2241349, 3310571, 2219420  
Fax: +254-20-318245, 318249  
Email: dg@nacosti.go.ke  
Website: www.nacosti.go.ke  
when replying please quote

9<sup>th</sup> Floor, Utalii House  
Uhuru Highway  
P.O. Box 30623-00100  
NAIROBI-KENYA

Ref. No.

Date:

**NACOSTI/P/16/1420/11283**

**22<sup>nd</sup> July, 2016**

Wilberforce Manoah Jahonga  
Moi University  
P.O. Box 3900-30100  
**ELDORET.**

#### **RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on "*The effectiveness of supervised industrial attachment programme in Technical Vocational Educational Training (TVET) Institutes: A case of selected institutions in the North Rift Region, Kenya,*" I am pleased to inform you that you have been authorized to undertake research in **Nandi, Trans Nzoia and Uasin Gishu Counties** for the period ending **22<sup>nd</sup> July, 2017**.

You are advised to report to **the County Commissioners and the County Directors of Education, Nandi, Trans Nzoia and Uasin Gishu Counties** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

**BONIFACE WANYAMA  
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner  
Nandi County.

The County Director of Education  
Nandi County.

The County Commissioner  
Trans Nzoia County.

The County Director of Education  
Trans Nzoia County.

The County Commissioner  
Uasin Gishu County.

The County Director of Education  
Uasin Gishu County.

### Appendix F: Research Permit

**THIS IS TO CERTIFY THAT:** **Permit No: NACOSTI/P/16/1420/11283**

**MR. WILBERFORCE MANOAH JAHONGA** **Date Of Issue: 22nd July, 2016**

**of MOI UNIVERSITY, 0-50100** **Fee Received: Ksh. 1000**

**kakamega, has been permitted to**

**conduct research in Nandi, Transzoia**

**Uasin-Gishu Counties**

**on the topic: THE EFFECTIVENESS OF**

**SUPERVISED INDUSTRIAL ATTACHMENT**

**PROGRAMME IN TECHNICAL**

**VOCATIONAL EDUCATIONAL TRAINING**

**(TVET) INSTITUTES: A CASE OF**

**SELECTED INSTITUTIONS IN THE NORTH**

**RIFT REGION, KENYA**

**for the period ending:**

**22nd July, 2017**

**Applicant's Signature**

**Director General**

**National Commission for Science, Technology & Innovation**

