ASSESSING TRAINING NEEDS OF THE PRINTING INDUSTRY IN KUMASI

By

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DECLARATION

I hereby declare that this submission is my own work towards the MA Publishing Degree and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the university, except where due acknowledgement has been made in the text.

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Abstract

This paper assesses the training needs of the printing industry in Kumasi with the intention of establishing the specific arrears of need for skills, knowledge and attitudes training. 80% of small-and-medium scale printing presses do not have training policies, do not conduct training needs assessment and do not have long-term strategies to ensure successive upgrade and recruitment of skilled labour to meet changing needs in the industry. Questionnaires and structured interviews were used to gather data to establish the skills, knowledge and attitudes gap. It identifies the current existing levels of basic (essential) skills, core skills and operative skills possessed by workers in the prepress, press and post-press sections of the printing industry. 12 out of 38 registered printing presses in Kumasi were through simple random sampling selected for the research and 45 respondents were in total assessed. Based on both quantitative and qualitative methods of analysis using charts, tables and descriptions, the gathered data was analysed. Based on existing literature and the findings of the researcher, recommendations are made to specifically the Department of Publishing Studies and all stakeholders to develop specific refresher and short-courses using a mixture of on-the-job and off-the-job training delivery methods to help upgrade prepare the industry for its international competition. Demonstration, apprenticeship mixed with lectures, discussions, and job-rotation are identified to be most effective methods of delivering training in the industry.

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LIST OF ABBREVIATIONS

GPPCA   Ghana Printers and Paper Converters Association

CPISC   Canadian Printing Industries Sector Council

HRSDC   Human Resources and Social Development Centre of Canada

TNA   Training Needs Assessment

PLA   Participatory Learning and Action

DIF   Difficulty, Importance, and Frequency

JHS   Junior High School

SHS   Senior High School

HND   High National Diploma

MSLC   Middle School Leavers Certificate

KSA's   Knowledge, Skills and Attitudes

OJT   On-the-Job Training

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CHAPTER ONE

INTRODUCTION

1.1 Background

Publishing is defined as the trade, profession or activity of preparing and producing material in printed or electronic form for distribution to the public, according to the A&C Blank Dictionary, (2009). Publishing is a process and printing is one of the stages in the process. Printing, traditionally, is the stage that the acquired, edited and ready for production information is reproduced. Printing is putting the information on paper or another substrate for the targeted audience to access it. In Ghana, newspapers, books, magazines, and the other publications are commonly produced in printed form (and for some with electronic equivalents), for the public. It is the printed copies that are ready for distribution and sales to complete the business of publishing.

In Ghana, like the rest of the world, "printing firms are operating on very narrow profit margins due to price competition, increased costs and over-capacity caused by moves by publishers to print off shore" (Accenture, 2001). In such an environment, a suitable mix of employees with the right kind of skills to meet the demands of the ever changing printing industry is a necessity.

In Kumasi, over 90% presses are small-to-medium scale in size employing less than 20 workers. Kumasi is a metropolis with a population of 2,604,909 (eu.wikipedia.org, 2010) and is regarded as the central commercial city for the northern part of Ghana. Commercial activities like printing are increasingly becoming competitive as the taste of customers keep changing.

In this rapidly changing global economy, businesses survive or thrive according to their ability to respond to change more successfully than their competition.

> "A key component of sustained competitive advantage is having skilled, knowledgeable and adaptable workforces that have broad technical, but also more generic knowledge and skills set" (Callan and Ashworth 2004; Gibb 2004).

Most workers in the printing presses hardly have any additional training once they start working. Many who were trained on the job as apprentices remain in the same printing press or move to another one without any further training to upgrade their skills. But with changing trends, skills upgrade is very important and must be practiced.

The question of whether the apprentices who are recruited are appraised and helped to obtain other specific training skills tailored to meet their needs, needs a tentative answer. Canadian Printing Industries Sector Council, (CPISC), skills and technology roadways released in October 2008 reported that printing companies increasingly need "adaptable, multi-skilled workers, who can operate computerized high-tech equipment, work co-operatively, interact with customers and enjoy a clear understanding of the entire printing process". Yes, computerised high-tech equipment are now gaining grounds in Ghana but all other issues raised are equally applicable in Ghana.

> "The employees that are able to work with new technology, met customer demands and understand changing print practise are best placed to remain employed and employable into the future. For the employers, skilled workers are highly valued for their commitment to the industry and their skills provide

a foundation for future training and development and they have the potential to have a positive impact on the industry in both the short - and long term." (Ekstein & Brown, 2009, a report of *Canadian Printing Industries Sector Council,* (CPISC)).

1.2 Statement of the problem

According to CPISC (2009), skills needed by an employee in the industry could be grouped into three namely basic skills, core skills and operating skills.

1.2.1 Basic skills include reading, writing, interpersonal skills, mathematical and calculation skills, problem solving, decision making, computer literacy and planning and organizing and others.

1.2.2 Core skills cover teamwork, health and safety, printing process, workflow process and control and quality assurance and others needed by all employees.

1.2.3 Operating skills are specific skills like preparing ink and inking systems, preparing cylinders, monitoring colour quality and performing wash-up, skills to operate a sheet fed, web or offset lithographic machines.

The low quality jobs printed in Kumasi have many contributing factors. One of the factors to the problem of quality is the skills levels of the workforce. Currently, there is no study and documentation of the skills level of the workforce in the printing presses in Ghana and Kumasi in particular. Therefore, there is the need for analysis to show the current skill level of workers and compare it with what standard skills each worker requires. The result would be necessary for training institutions like the Department of Publishing Studies to plan training programmes for interested printing presses.

1.3 Objectives

The objectives of this thesis are:

1. Conduct a training needs assessment of selected printing presses

2. Explore the training delivery methods that are most effective for the printing industry

3. Present a recommendation for the Department of Publishing Studies to develop training courses for the printing presses.

1.4 Significance of study

The findings would serve as a feedback from industry in areas that need training and the model of training that would be most appropriate.

The study would also parallel studies done in Canada and Australia in small-to-medium scale printing presses that have similar characteristics as Ghanaian presses.

The study would also help confront the "people impact" of technology in the industry in Ghana. This would help make clear areas in which industry can develop people to increase quality and profitability without necessarily purchasing new machines.

The thesis would also become a reference material for other students' research.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

"Many business challenges such as the introduction of new technology, or increased business competition, can be more easily met when employees are well prepared and trained to have the required skills." (Human Resources and Social Development Centre of Canada [HRSDC], 2010).

The printing industry requires both technical skills and general skills. Technical skills are skills and attitudes that are specific to the operations of the machinery and systems in the printing industry. General skills are those that are required skills to get a job done efficiently and effectively irrespective of the type of work. "The training needs assessment is a critical activity for the training and development function. Whether you are a human resource generalist or a specialist, you should be adept at performing a training needs assessment." (Miller and Osinski 2002).

This review of literature looks at some of these essential skill elements relevant to the topic under research: skills, training, needs assessment, and the printing process.

2.2 Categories of skills

"A skill is an ability to perform a productive task at a certain level of competence" (Shah & Burke, 2003). In between 2007 and 2008, CPISC using a unique approach to the development of skill standards that mirrors the way the industry is organized and functions instead of by occupation, it developed basic, core and operating skill standards for the press process area.

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2.2.1 Basic skills

They are basic or "essential" to all work types. They include reading, writing, interpersonal skills, mathematical and calculation skills, problem solving, decision making, computer literacy and planning and organizing. They are also called "enabling skills", facilitating the using and development of other skills. For example, interpersonal skills of a worker would help in building a team. To operate a press, an operator reads instructions in manuals. These basic skills largely reflect the essential skills developed by HRSDC and the employability skills developed by the Canadian Conference Board.

The researcher would dwell on the documents from HRSDC and CPISC as the standard skill descriptions adaptable in the Ghanaian situation. A thorough specific skills standard has been established for the printing industry in these documents.

2.2.2 Core skills

They are those that make-up **a broad-knowledge of the industry**. Most of them are general skills required in all the print process areas. Some may be more relevant to a particular process though. They include: teamwork, health and safety, printing process, workflow process and control, quality assurance and customer service. All employees require them as the **foundational skills** in some form.

2.2.3 Operating skills

They relate to specific operating functions within a process area. "A function is defined as a set of related work activities organized in either chronological or operational order that often cut across occupations. In other words,

functions are not highly specific job tasks but groups of related activities that often cut across job titles." - CPISC, (2009)

In the press section, for example, operating skills could include such basic operations as preparing ink and inking systems, preparing cylinders, monitoring colour quality, operating a sheet fed, web, flexographic or offset machine. The above categories of skill-standards are specific to the printing industry so they would be an effective assessment basis to find out the skill gaps in the Kumasi industry.

In the 2009 Journal of CPISC, it was noted in the editorial that

"based on the information obtained from the skills standards and the review of training programs and providers, CPISC is now in a better position to map the agreed-upon skill standards against existing formal and non-formal training programs and perform a gaps analysis to determine if a learning/training needs exist that are not being met. … CPISC will also determine what training is required to fill the gaps, and identify the most effective training delivery and knowledge transfer models."

Performing gap analysis to determine existing training needs and most effective training delivery model is a key significance of this research.

2.3 Training

2.3.1 What is training?

According to Annex (2003), generally, training involves the development or strengthening of three main aspects: knowledge, skills and attitudes. Usually these three aspects have to be taken together. All of them need to be addressed, if a person is to develop himself or herself to contribute effectively to a group or organization to which she or he belongs. So training is about enabling people to gain knowledge, to practise their skills and to shape their attitudes.

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2.3.2 What is the importance of training?

Printing enterprises must invest more in their people to encourage the development of skills that will enable printers in the new services economy to have services and products available to convince their customers to continue to use the printing industry (APIS Business Services, 2004; Department for Industry, Science and Resources, 2001).

These skills needed by the printers can be developed through many ways, one of which is training. In Ghana's developing economy, the print industry as a manufacturing industry cannot afford to be stagnant in the era of fast changing skills due to technology. It is important to have the necessary skill standards to match the global trends in the industry.

2.4 Training needs

DeSimon and Harris (1998) state that a "need can either be a current deficiency, such as a poor employee performance, or a new challenge that demands a change in the way the organization operates." A need is not a want or a desire. It is a gap between "what is" and "what ought to be". Therefore training needs are those skills, knowledge and attitudes deficiencies identified to be solved through training.

2.5 Training Needs Assessment (TNA)

2.5.1 What is training needs assessment?

Needs assessment is used for identifying gaps and to provide information for a decision on whether the gaps could be addressed through training. The assessment is part of a planning process focusing on identifying and solving performance problems.

Ferdinard (1988) described Training Needs Assessment as a "rational process by which an organization determines how to develop or acquire the human skills it needs in order to achieve its business objectives"; hence, it is anticipatory in nature intending to meet long-term organizational objectives (Snape *et al.,* 1994).

TNA is usually related to organizational and individual performance. A needs assessment means that the individual assessed has a defined job performance or that an organization has defined objectives and goals. So the needs assessment could be done as: organisational assessment, task assessment and individual assessment.

The organizational assessment looks at the effectiveness of the organization and determines where training is needed and under what conditions it will be conducted. The researcher would however limit the research to individual and their task assessment. This is because the objective of the research is to do a gap analysis of the existing individual employees' skills in relation to performance and what it should have been.

Assessment of the individual performance could be done by using the detailed job description developed by the organization for its employees, where available, accessible and meet the objectives of the researcher. "Creating detailed job descriptions can help in clearly communicating the work objectives you want your employees to achieve" said, HRSDC.

2.5.2 Why should a training needs assessment be conducted?

"The results of the needs assessment allows the training manager to set the training objectives by answering two very basic questions: who, if anyone, needs training and what training is needed." (Miller and Osinski, 2002).

The primary purpose of the training needs assessment is to ensure that there is a need for training and to identify the nature of what a training programme should contain. A training needs assessment provides the information needed for developing a training plan that is based on the learning needs of the employees.

It increases the relevance of the training and the commitment of the learners, as they are involved in the preparation of the training design that reflects their expressed needs. Thus, it helps to foster a rapport between the facilitators and the participants. The facilitators can acquire basic knowledge of the strengths and limitations of the participants and the learners can become partners in analyzing their own learning needs.

Swist (2001) stated that "A needs assessment provides an opportunity to consult with a variety of people in the organization. The information collected, ideas generated, and the conversations that take place when people discuss their work lives lend enthusiasm to the process. The data collected - … - can clarify issues and provide a focus on performance."

2.5.3 How should a training needs assessment be conducted?

There are many tools and methods for undertaking training needs assessment. These tools and techniques range from questionnaire-based surveys to participatory learning and action (PLA) tools according to Annex, (2003).

Training needs assessment could be conducted using questionnaires, interviews, focus group discussions or tests. For the purpose of this research the researcher would combine questionnaires and interviews. All the tools would be discussed under the methodology of this research.

2.6 Printing

2.6.1 What is printing?

"Printing is a process for reproducing text and image, typically with ink on paper using a printing press. It is often carried out as a large-scale industrial process, and is an essential part of publishing and transaction printing" according to Absoluteastronomy.com.

"Printing is a reproduction process in which printing ink is applied to a printing substrate in order to transmit information (images, graphics, text) in a repeatable form using an image-carrying medium (e.g. a printing plate)"(Kipphan, 2001). Simply, Printing is described as the process of transferring ink onto paper (or another substrate) via a printing plate.

The printing production process areas are prepress, press and the post-press. Pre-press includes preparing digital and traditional material for the press, according to customer's specifications. Press involves the actual printing of the document on a sheet-fed or web offset press. A sheet-fed press prints on sheets whilst web-fed on rolls of paper. During the press process, employees install and adjust plates, prepare blankets and cylinders, select and mix inks, run the press, monitor print quality and press performance, troubleshoot problems, ensure a safe operating environment and perform preventive maintenance on presses. Post-press employees collate and bind printed sheets, perform finishing operations such as drilling, embossing and laminating, and package the final product for the customer. The skills required in these operations would be analysed in the selected printing firms.

2.7 The printing industry in Kumasi

The printing industry in Kumasi uses mainly the offset lithographic process. Some firms still use Letterpress printing for some jobs though. The research focused on the registered printing presses and their workers and not on freelance print finishers in Kumasi operating as individuals and others as small groups for example.

In Kumasi, the sheet-fed system is dominant and as such the machine operators assessed are all users of this system operating Kord 64, AB Dick and Multilith machines. In the prepress area, the common software in use for designing and colour separation are Photoshop and Corel Draw. Others are Adobe Indesign (replacing Adobe Pagemaker), Illustration and the Microsoft Office suit. Image processing, proofing and the filming are done by Imagesetter straight from the computer. There are some places, however, that still use the darkroom camera for some type of works.

The workers require constant upgrade of skills and knowledge to meet the changing trends of technology in the production process areas which are each highly complex and integrated, and vary widely with the size of the company, types of presses, range of job titles and production output. The industry in Kumasi would benefit from the training needs assessment for the implementation of the appropriate and suitable training activities and programmes tailored for the industry in Kumasi.

> "The future viability of the printing industry rests on the capacity of the industry to alter its mindset, such that it provides not only products that are part of the traditional printing industry (for example, books, brochures, advertising materials), but also products from the emergent ancillary industry (such as graphic design, desktop publishing, telemarketing, e-books, multimedia services). This will allow printers to provide more complete business solutions for their customers." (Callan, 2007) in a research for the Australian Government and that is true for Kumasi too.

2.8 Training delivery methods

Training has been defined as the systematic acquisition of the knowledge, skills and attitudes (KSA's) necessary for effective performance in work environments Goldstein & Ford (2002). Training delivery methods therefore consist of the techniques and materials used by trainers to structure learning experiences. According to Blanchard (2006), different training delivery methods are better or worse at achieving various learning objectives. The aim of the training delivery methods are to bridge the gap between the standard skills and the actual skills possessed by employees in the printing industry through different learning processes; the delivery methods are not results themselves but are means to achieve results. They are meant to build and develop skills capacity of employees.

Organizations have put in place formal and informal mechanisms for individuals and teams to learn, and this requires huge sums of investment per year (ASTD, 2005). According to Salas (2009), this investment deserves tangible outcomes in personnel skill acquisition, increased productivity, lower rates of error, better decisions, and, of course, competitive edge.

Although the scope of the research is limited to the printing presses in Kumasi, nevertheless the usefulness of the training delivery methods are not limited to the printing presses in Kumasi but they are valuable to all the printing presses in Ghana as a whole. There are many different methods of training. Each has strengths and weaknesses and must be selected to fit the training content, the trainer, and the trainees (Goldstein, 1974). They have been categorized into on-the-job and off-the-job training methods.

2.8.1 On-the-job training

On-the-job training is a combination of many methods and is effective at developing knowledge, skills, and attitudes, but is best at the latter two. It is the most common method of training; on-the-job training (OJT) uses more experienced and skilled employees to train less skilled and experienced employees. OJT takes many forms and can be supplemented with classroom training.

Hall and Goodale (1986) assert that in on-the-job training, a new employee is typically assigned to a supervisor or experienced co-worker who is responsible for teaching a newcomer. Emphasis is on learning by doing. Occurring in the work setting, on-the-job training is relatively inexpensive and realistic, and its goal is clear. This method also provides opportunity for practice and immediate feedback.

On-the-job training is not successful when used to avoid developing a training programme, though it can be an effective part of a well-coordinated training program (Blanchard, 2006). According to Hall and Goodale (1986), three of the more common are apprenticeship training, job rotation, and coaching and mentoring.

2.8.1.1 Apprenticeship training

Apprenticeship is the process of learning a skilled trade through training on the job (practical experience) plus acquiring the related technical knowledge, usually in a classroom. The length of training in an apprenticeship program varies from one to six years, depending on the trade (University Of The State Of New York (USNY), 2000). They are most often found in the skilled trades and professional unions such as boiler engineers, electrical workers, pipe fitters, carpenter, etc (Blanchard, 2006).

Learning and Skills Council (LSC) (2005) also defines apprenticeship as a training programme undertaken in the workplace, giving young people the opportunity to earn money while developing valuable skills and qualifications. Apprenticeship provides the opportunity for learners to "earn and learn" in a wide range of occupations; it gives opportunities to young people and bring new people into an industry. Formal apprenticeship programs are regulated by governmental agencies that also set standards and provide services (Blanchard, 2006).

For apprenticeship to provide progressive routes to higher-level skills and qualifications,

- Supervisors must be well trained and competent to supervise trainees.

- Health and safety must be an integral part of the training that the apprentices receive.

- The employer should monitor the training at regular intervals (LSC, 2005).

The question is whether the apprenticeship practiced in the presses in Ghana has these understandings and implement the training through such systematic clarifications.

2.8.1.2 Job rotation

In job rotation, employees move from one part of the organization to another, assuming specific assignments and job responsibilities at each location. Assignments can last from a few days or weeks to a year or more. The goal is to provide employees with broad understanding of the relations among functions within a department (Hall & Goodale, 1986). For example a machine minder who operates

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letterpress machine might spend days, weeks, or months operating Kord 64 machine in a job rotation programme.

2.8.1.3 Coaching and mentoring

Coaching is a process of providing one-on-one guidance and instruction to improve the work performance of the person being coached in a specific area. Usually, coaching is directed at employees with performance deficiencies, but it can also serve as a motivational tool for those performing adequately. Typically the supervisor acts as the coach. Like the OJT trainer, the coach must be skilled both in how to perform the task(s) and how to train others to do them (Blanchard, 2006). Coaching normally occurs any time a supervisor feels that an employees' work needs improvement (Hall & Goodale, 1986).

Mentoring on the other hand is a form of coaching in which an ongoing relationship is developed between a senior and junior employee. Mentoring is more concerned with improving the employee's fit within the organization than improving technical aspects of performance, thus differentiating it from coaching. Generally, though not always, mentors are only provided for management-level employees (Blanchard, 2006).

In the new millennium, good coaching and mentoring schemes are deemed a highly effective way to help people, through talking, increase self-direction, self-esteem, efficacy, and accomplishments (Serrat, 2009). Unlike conventional training, coaching and mentoring concentrate on the person, not the subject; they draw out rather than put in; they develop rather than impose; they reflect rather than direct; they are continuous—not one-time—events. In brief, they are a form of change

facilitation. Coaching and mentoring can be used whenever performance or motivation levels must be increased (Serrat, 2009).

2.8.2 Off-the-job training

Other training methods occur off the job. They are used in internal training courses by company personnel and external consults, as well as in external training courses (Hall & Goodale, 1986).

2.8.2.1 Lecture method

According to Blanchard (2006) lecture is best used for creating a general understanding of a topic. Several variations in the lecture format allow it to be more or less formal and/or interactive. In the pure lecture, communication is one way—from trainer to trainees. It is an extensive oral presentation of material.

Lectures should be brief, well organized, and supplemented with printed material for future reference. Coupled with questions and discussion by trainees, the lecture is an effective device for transferring knowledge from trainer to trainee (Hall & Goodale, 1986). It can be useful in situations in which a large number of people must be given a limited amount of information in a relatively short period; however, it is not effective for learning large amounts of material in a short time period. Blanchard (2006) concludes that lecture allows trainees to read the material at their leisure and as often as necessary to retain the material.

2.8.2.2 Audiovisual techniques

"Both television and film extend the range of skills that can be taught and the way information may be presented. Many systems have electronic blackboards and slide projection equipment. The use of techniques that combine audiovisual systems

such as closed circuit television and telephones has spawned a new term for this type of training, 'teletraining'" (Taylor, 2009).

Slides, movies, and video-tapes have advantages of permanence and repeat - ability. They can also be shown simultaneously to several audiences. Audiovisual aids can supplement lecture material by providing vivid illustrations. They are also excellent in developing skills via taped demonstrations for guidance and via tapes of trainee practice sessions for feedback (Hall & Goodale, 1986).

2.8.2.3 Case study

A training technique used primarily in managerial training is the case study. A "case" or a written description of a work problem is given to trainees to study individually and to identify the causes of the problem and the appropriate solution. The case is then discussed in a group session conducted by the trainer. The assumption is that trainees will learn diagnostic skills and discover underlying principles concerning the causes and solutions of work problems (Hall & Goodale, 1986). It presents a problem for employees to solve after thinking and analyzing it.

2.8.2.4 Discussion method

The discussion method uses two-way communication between the lecturer and the trainees to increase learning opportunities. A short lecture (20 minutes or less) to provide trainees with basic information is given followed by a discussion among the trainees and between the trainees and the trainer that supports, reinforces, and expands upon the information presented in the short lecture.

Questioning (by trainees or the trainer) and discussions enhance learning because they provide clarification and keep trainees focused on the material. Both the

lecture and discussion method are useful for changing or developing attitudes, though the discussion method is more effective. If the training objective is skill improvement, neither the lecture or discussion method is appropriate (Blanchard, 2006).

2.8.2.5 E-learning

E-learning can be defined as the use of computer network technology, primarily over an intranet or through the Internet, to deliver information and instruction to individuals (in our case, employees). Some of the terms such as computer-based learning, on-line learning, distributed learning, or web-based training are associated with e-learning (Welsh, E. T. et al, 2003).

> "Practitioners (Berry, 2000; Coné and Robinson, 2001; Rossett, 2002) and researchers (Brown and Ford, 2002; Salas et al., 2002; Steele-Johnson and Hyde, 1997) agree that technological advances are dramatically altering the training and development landscape. In particular, the increased use of Internet technologies to deliver training has-been heralded as the 'e-Learning Revolution' (Galagan, 2000: 25). Although precise estimates for growth in e-learning vary, published estimates indicate that organisations have increased and will continue to increase the use of technology to deliver training (Rossett, 2002)" (Welsh, 2003).

E-learning focuses primarily on training delivered via network technology. It can be asynchronous (pre-recorded) for anytime usage or synchronous-learning (live) where all learners must be in front of their computers (Rosenberg, 2001).

E-learning is an alternative to classroom-based training, and it can provide a number of advantages. E-learning can:

- reduce trainee learning time, by allowing trainees to progress at their own pace

- reduce the cost of training, particularly by reducing costs associated with travel to a training location

- provide instructional consistency, by offering the same training content to employees worldwide

- allow trainees to learn at their own pace thereby reducing any boredom or anxiety that may occur

- provide a safe method for learning hazardous tasks with computer simulations

- Increase access to training to learners in locations around the world (Blanchard, 2006).

2.8.2.6 Demonstrations

According to Neuroscience and cognitive psychology, 83% of our learning takes place through our sense of sight (Hurt, 2012). The best way we can pass on to others what we know is by showing them. Giving a demonstration is really advanced show-and-tell.

Demonstration-based learning is generally understood as the observation by the learner of another person (or team) performing the tasks, components of tasks (either in real time or through some form of recorded or computer generated medium), or characteristics of the task environment that have been targeted for training (Salas, 2009).

Researchers, Salas & Cannon-Bowers (2001); Tannenbaum & Yukl (1992) believe that in recent years, organizations have turned towards simulations (or synthetic learning environments) in order to prepare personnel for work in complex and dynamic environments. These simulations have been designed to provide training with information, demonstration, practice and feedback on needed knowledge, skills, and attitudes.

With all this different training delivery methods discussed, it is clear that "one size fits all" approach would not work in the printing industry, so multiple training delivery options could be adapted to suit specific situations based on the gap analysis.

CPISC argues also that, to compete effectively in the emerging environment, printing and graphic communications firms need a highly skilled workforce – one in which workers hold a broad range of skills and knowledge, including higher technical skills. Specifically, firms will increasingly require adaptable, multi-skilled workers who can operate computers, analyse problems, make decisions, work cooperatively, interact with customers and who have a solid understanding of the entire printing production process. In the CPISC research, employers commented often that new graduates were not entirely "work ready", that they are lacking in both technical and essential skills to complete the assigned tasks effectively. This calls for redress.

2.9 The detail profile description of printing press operators

Printing press operators set up and operate sheet and web-fed presses to print illustrations, designs and text on paper, plastic, sheet and other substrates. Summary of Essential [Basic] Skills needed according to HRSDC

2.9.1 Reading text

According to HRSDC (2010), examples are: they review safety procedures on warning labels on presses. The text may consist of a few brief sentences. They should read daily to learn about the status of various jobs and about any equipment

problems and specification changes that require their attention, read about press features and operating procedures.

Table 2.1: Reading text

Type of Text	Purpose for Reading			
	To scan for specific information/To locate information	To skim for overall meaning, to get the 'gist'	To read the full text to understand or to learn	To read the full text to critique or to evaluate
Forms	√	√	√	
Labels	√			
Notes, Letters, Memos	√	√	√	
Manuals, Specifications, Regulations	√	√	√	
Reports, Books, Journals	√	√	√	

Source: HRSDCs Profile Description   **Date Modified: 18-06-2010**

NB: √ The checked columns indicate, the meaning applies

2.9.2   Document use

Documents such as job dockets, job record files, information on the packets of papers and inks about their use are used in the industry. The printing operator needs to use these documents for records, quality management and minimizing waste among others.

Printing Press Operators, HRDSC (2010) profile description updates:

- Make sketches to instruct trainees about press operation, sketches for sample die cuts and may create tables to facilitate the conversion of job specifications from imperial units to press settings in SI units.

- Create and read and enter information on tables, schedules or other table-like text. Obtain specific information from and interpret graphs or charts.

- Read assembly drawings (e.g. those found in service and parts manuals). Obtain information from sketches, pictures or icons (e.g., computer toolbars). And much more.

Most agreeably, not all the summary of standards above would apply to the Ghanaian press context currently, but to get there, training and continuous learning is the way forward for the industry to become competitive in the next decade.

2.9.3 Writing skills

Writing includes writing texts and writing in documents (for example, filling in forms) and non-paper-based writing (for example, typing on a computer). Workers write comments on finished job dockets to note any unusual occurrences during the run. For example, a printing press operator may keep notes which specify the inking amounts and sequences used on each job.

Table 2.2: Writing skills

Length	Purpose for Writing						
	To organize/to remember	To keep a record/to document	To inform/to request information	To persuade/to justify a request	To present an analysis or comparison	To present an evaluation or critique	To entertain
Text requiring less than one paragraph of new text	√	√	√		√		
Text rarely requiring more than one paragraph	√	√	√		√		
Longer text		√	√		√		

2.9.4 Numeracy

It refers to the workers' use of numbers and their thinking in quantitative terms. It consists of Numerical Calculation and Numerical Estimation Complexity Rating. The operator uses money maths, measurement and calculation math with measuring instruments, scheduling or budgeting and Accounting math among others.

Examples from HRSDCs (2010) Profile Description are:

- estimation of the amount of ink required for runs by considering many factors such as the quantity and type of substrate and room humidity.

- estimation of how long a job will runs and determine whether they can accommodate additional runs from other presses without disrupting their production schedule. This needs considering the mechanical performance to avoid estimation errors, which can result in missed deadlines.

- calculate spoilage rates using counter readings for the total number of copies and the number of good copies printed. (Data Analysis Math)

- use specialized instruments to take precise measurements. (Measurement and Calculation Math). Printing Press Operators make calculations in their heads, using pen and paper or use calculators

2.9.5 Oral Communication

Oral Communication pertains primarily to the use of speech to give and exchange thoughts and information by workers. Modes of communication are done in person or through the phone, with special work jargons and signals. For example, use informal hand signals to coordinate tasks with helpers. They may signal the helper to run, or stop a press. The noise level in the environment affects clarity of what is being said in some cases. "Communication in large press rooms usually requires physically going to where the other worker is located which can slow down communication." said HRSDC, (2010).

The purposes for oral communication are so many including listening to receive directions and explanations, interacting with co-workers, supervisors or managers to seek for information and co-ordinate work with that of others, interact with customers or clients, suppliers and servicers, to discuss opinions among others.

2.9.6 Thinking skills

Thinking Skills differentiates between six different types of cognitive functions. These functions are interconnected though. They are: Problem Solving, Decision Making, Critical Thinking, Job Task Planning and Organizing, Significant Use of Memory, and Finding Information.

2.9.6.1   Problem solving

An operator may deal with a variety of defects in printed images such as poor registration and alignment, poor colour density, hair and hickey impressions, dot gain and ink smudging. They examine their stock, ink and equipment to determine if plate imperfections, poor cylinder adjustments, incorrect ink settings or sequencing, inaccurate roller pressures, poor water-to-ink balances or incorrect ink drying temperatures are responsible. Operators try likely solutions and run tests until the faults have been corrected

2.9.6.2   Decision making

Decision making includes deciding which are the likely causes of printing problems from among numerous possibilities, making scheduling and task assignment decisions, deciding at what speeds to maintain presses during job runs in order to meet production timelines and minimize waste among other examples.

For example, an operator decides whether to adjust roller settings according to how poor the product quality is and to what extent the adjustment would slow production. The operator can consult a supervisor for advice. A press operators may decide what tasks to assign helpers depending on the helpers' experience and how accustomed they are to working together.

2.9.6.3 Critical thinking

It has mainly to do with evaluating and assessing situations like: evaluate the clarity, completeness and reasonableness of job docket instructions. These evaluations involve understanding industry terminology, recognizing when others may be using terminology incorrectly and envisioning the products that would result

by following job instructions. They also consider whether problematic requests are intentional or the result of error.

The quality of test copies is evaluated to determine if press adjustments are needed. They use measurements to check things such as image alignment, colour densities, and cut-offs. They also make subjective judgments of colour quality.

2.9.6.4 Job task planning and organizing

Printing Press Operators for example plan and organize their own tasks to complete jobs assigned by their supervisors. They generally have discretion to sequence tasks for maximum efficiency; for example, they may group jobs that use the same colours, rollers and cylinders to minimize the time needed for cleaning and set-up between jobs. They may also plan and organize others in their team to work.

2.9.6.5 Significant use of memory

Printing Press Operators for example remember characteristics associated with repeat customers, remember the different effects of different adjustments such as the effects different colour strengths have on papers and the effects different ink viscosities have on different substrates grammages and remember solutions for various press faults without having to refer to technical manuals and calling in specialist at the least fault.

2.9.6.6 Continuous learning

Continuous Learning examines the requirement for workers to participate in an ongoing process of acquiring skills and knowledge. In a working context, HRSDC (2010) states that printing press operators learn continuously through performing a variety of jobs and through talking with more experienced co-workers. The goals and

processes of continuous learning are largely determined by their job demands and employers. Continuous skill updating is very important to keep abreast of new printing techniques, trends in highly computerized presses and new materials such as ink types and printing substrates.

2.9.6.6 Computer use

Computer Use indicates the variety and complexity of computer use within the printing industry.

Burt (2009) says this about the need for skills in a changing print industry in Canada, "While printing press and machine operators are still the single largest group of employees in the industry – making up 40% of employees in the industry – their share of jobs is declining. Where we are seeing growth is in occupations associated with creative design, computer and information system and sales"

This situation reflects the growing trend in the industry in Ghana and Kumasi is not an exception. Gradually, desktop publishing and customer-finished files are being sent to the press for printing and finishing. The need for computer skills by the press operator is needed now and will increasingly become a necessity.

HRSDC (2010), identifies it as an essential skill. Skills in a word processing software, databases, spreadsheets, internet usage, computer-related designs and file management to remain employable in the changing industry.

In Summary, the definition of the specific skills detailed above applies to all the other workers in the press room although the most essential/basic skills for the different workers are slightly different.

According to HRSDC (2010), the most important **Essential Skills** for

- o **Printing Press Operators** are: Numeracy, Decision Making and Critical Thinking.

- o **Prepress technicians and workers** are: Document Use, Oral Communication and Decision Making.

- o **Binding and Finishing Machine Operators** are: Numeracy, Oral Communication and Job task planning and organizing.

- The **Core skills** to be assessed in the research are: teamwork, health and safety, printing process, workflow process and control and quality assurance.

- The **Operating skills** to be assessed are for printing press operators includes preparing ink and inking systems, preparing cylinders, monitoring colour quality and performing wash-up, preventive maintenance of machines.
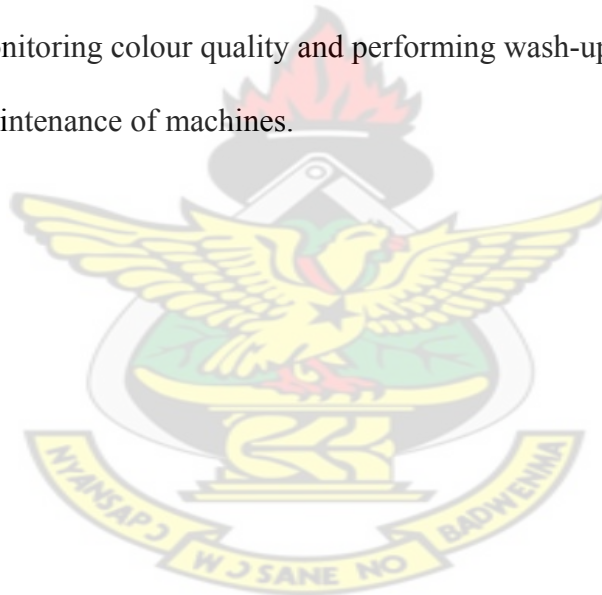
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CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter deals with the procedures used in conducting this research. The chapter is organized as follows: Scope of Study, Sampling Technique and Sample Size, Data Collection Method, and Mode of Analysis.

3.2 Scope of study

The population of the study is printing presses in Kumasi - mostly concentrated in Adum, Asafo, Afull Nkwanta, Amakom, and Kejetia and are members of the Ghana Printers and Paper Converters Association (GPPCA). According to Basha and Harter (1980) "a population is any set of persons or objects that possesses at least one common characteristic." The population is 38 registered Printing press. The llist obtained from GPPCA helped minimized any biases with choosing the sample size and prevented any complexities with getting the exact population of presses in Kumasi giving rise to unreliable sampling.

3.3 Sampling technique and sample size

Sampling entails gathering information from only a fraction of the population or phenomenon under study (Walliman, 2002). The researcher employed simple

random sampling technique to draw twelve (12) printing presses from the
population(38).

Simple random sampling technique ensures that samples are drawn so that
each element has an equal chance of being drawn during each selection round. The
chosen representative sample elements ensure that the result could be generalised to
a large extent (Opoku-Amankwa, 2002). This technique has the advantage of
reducing bias and enables the researcher to estimate sampling errors and the
precision of the estimates derived through statistical calculations (FCDSMHS, 2003).
It therefore avoids any complexities that may give rise to unreliable sampling.

See the breakdown of the 45 respondents from the eight (8) printing presses below.

Table 3.1: The printing press and the number of respondents

Name of Press	NO. of Personnel Sampled
Freeman Printing Press	7
Bobsco Printing Press	7
Universal Printing Press	8
University Printing Press (UPK)	8
Print Kraft	5
Payless Publishing	4
Nut Printing Press	5
Annosco Press	1
Total	**45**

Since the sample size, n>30, the researcher would use the outcome of the research to make a generalization about training needs assessment of the printing presses in Kumasi.

3.4 Data collection method

Data collection method can either be qualitative or quantitative. According to Saunders et al (2007), qualitative data refers to all non-numeric data that have not been quantified. Data is in the form of words rather than numbers and perspectives (Ary et al, 2002). Quantitative method on the other hand inquiries use of numerical and statistical processes to answer specific questions (Wholey et al, 2004); it is based on the idea that social phenomena can be quantified, measured and expressed in numerical terms that can be analysed by statistical methods. Due to the nature of the study, the researcher employed both quantitative and qualitative methods where numbers and descriptions were used in analyzing the data.

3.5 Data gathering tools

For the purpose of this study, secondary and primary sources were used in the collection of data. Secondary sources refer to the works of others in form of books, articles from journals and newspapers, in addition to the use of information from the internet. The factors that influenced the sources of data the researcher used were the amount of time the researcher had to do the study, the level of accuracy required, the accessibility of the data source, and the fact that it is just one researcher involved with the study.

Primary source of data involves first-hand information from the field of study. Questionnaires were administered to the respondents (sample in appendix 8). The questions were both closed and open-ended for prepress, press or post-press section respondents. The questionnaires were administered person-to-person and like a structured interview the questions were explained and the researcher asked for further clarifications to ensure uniform information and assure comparability of data.

According to Opoku-Amankwa (2002) interviews have the advantages of being useful for collecting in-depth information; questions can be explained to make ensure it is not misunderstood; interview have a wide application and more so in-cases where a machine operator may have problem with sitting to answer a questionnaire; information can be supplemented with what the researcher observes in the course of the interview.

The questionnaires were divided into two main parts—educational and personal data part, and skills, knowledge and attitude (KSA) assessment part. The KSA assessment part is further divided into three part—Essential (Basic), Core and Attitudes, and Operational Skills. The skills assessment part has a list of skills which must be scored from a scale of 1 to 10 under the headings, "I do this", "Difficulty", "Importance", and "Frequency". See details in appendix 9.

3.6 Mode of analysis

The data collected was analyzed both qualitatively and quantitatively. Statistical tools in Microsoft Excel—columns, tables, and charts—were used in presenting the findings in numerical terms, and were discussed in a descriptive manner.

3.7 Limitations

The respondents' availability for the interview affected the speed of work. This limited the number of presses the researcher could study within the scheduled time from 12 to 8. The four presses could not make time for structured interviews neither were questionnaires returned. Job description documents, organizations operational and strategic plans, and employee appraisal documents were not made available to be analysed therefore the hypothesis chosen by the researcher could not be factually proven although by implication the hypothesis 2 and 3 are proved.

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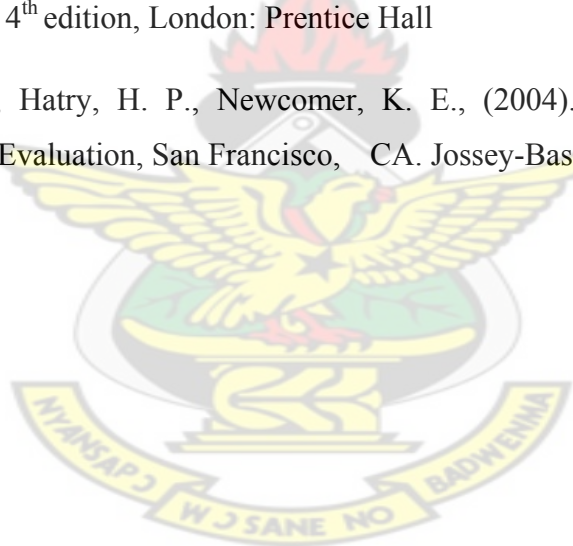
CHAPTER FOUR
RESULTS AND DISCUSSIONS

4.1   Introduction

Data gathered by the researcher is compiled and interpreted to help assess the training needs in the printing industry in Kumasi. The relationships, measurements and comparisons of the data gathered are of relevance in drawing conclusions.

The researcher analysed and discussed the data gathered from the selected printing presses in Kumasi in relation to the objectives of the study.

4.2   Training needs assessment of selected printing presses

This section assesses the existing basic, core and operating skills as well as the attitudes and knowledge levels of the respondents based on the collected data. To analysis the gaps existing and assess the training needs according to the objectives of the thesis is the data compared with the standards specified in the literature review.

4.2.1   Educational background and personal data of respondents

From Fig. 4.1 below, 8 (17.78%) of the respondents are Junior High School (JHS) graduates, 14 (31.11%) are Senior High School (SHS) graduates, 11 (24.44%) are Vocational and Technical school graduates who all did General Printing at National Vocational and Technical Institutes (NVTI), 3 (6.67%) are Certificate and Diploma holders (1 with Diploma in Office Management and 2 with Certificate in computer software applications), 2 (4.44%) are Graphic Design HND holders, and 1 (2.22%) with BA. Publishing Studies (Design and Illustration Option), while the remaining, 7 (15.56%) represent other educational qualifications (namely O and A levels, Middle School Leavers Certificate, Form 4, etc).

Fig 4.1: Educational level of respondents

	JHS	SHS	Voc. & Tech.	Cert. & Diploma	HND	Degree	Others
Number of Respondents	8	14	11	3	2	1	7
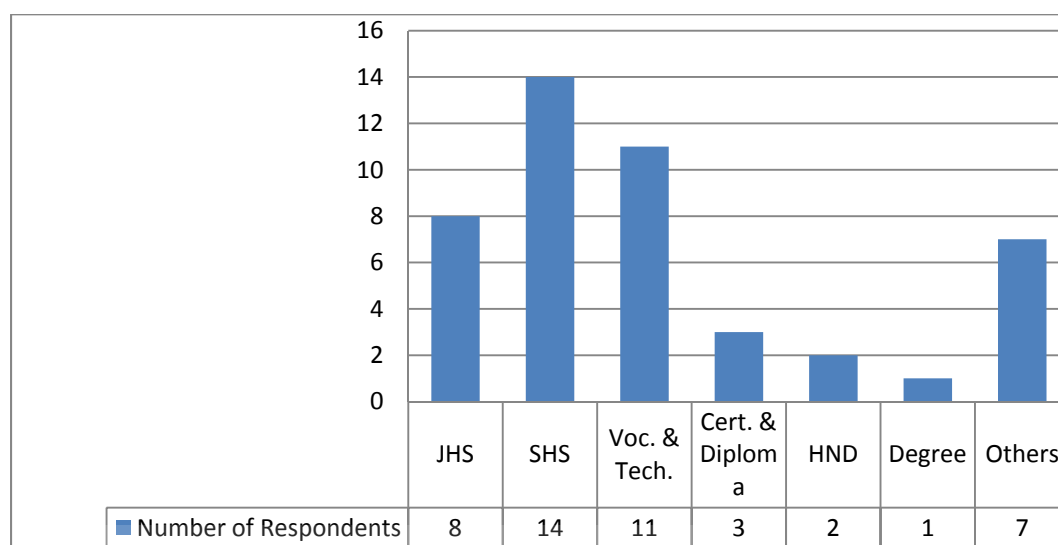
From the data, only 14 (31.11%) of the respondents had some academic knowledge in printing. This means 31 (68.89%) being the JHS, SHS, 3 certificates and diploma holders and 7 other certificate holders have no academic knowledge in printing. Apart from the HND and degree holders (a total of 3 (6.66%)), with degree holders being the least number employed, the remaining 93.34% have not obtained knowledge in printing at the tertiary level.

With 45 respondents from 8 printing presses the average number of respondents per press is 6. With 6 employers per press and 68.89% having no academic knowledge in printing, it implies averagely 4 out of the 6 employers have no academic knowledge in printing. From this analysis, the researcher is of the view and as supported by reviewed literature that lack of personnel with adequate academic knowledge is a gap that contribute to poor products quality standards in Kumasi.

Fig. 4.2: Gender of respondents

	JHS	SHS	Voc. & Tech.	Cert. & Diploma	HND	Degree	Others	Total
■ Male	8	8	3	3	2	1	6	31
■ Female	0	5	8	0	0	0	1	14
■ Total	8	13	11	3	2	1	7	45
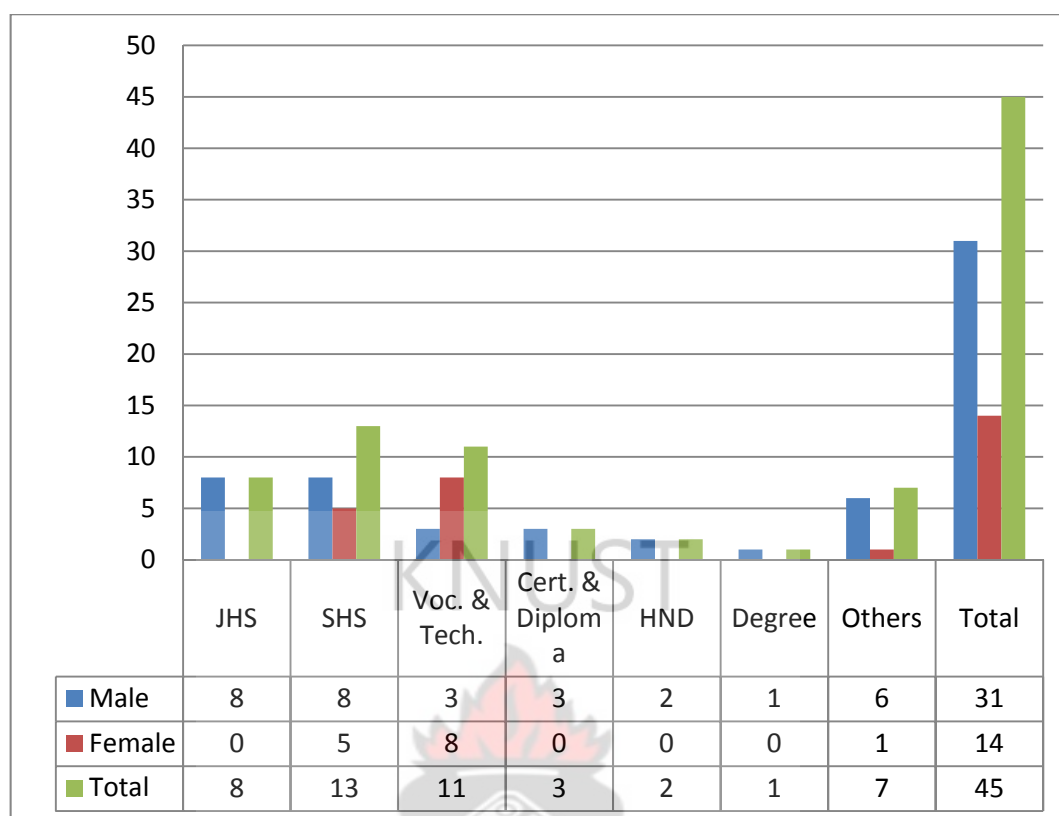
From Fig. 4.2 above, 31 (68.89%) out of the total respondents are male and the remaining 14 (31.11%) are female. The 8 (100%) JHS respondents are males; of the 13 SHS respondents, 8 (61.54%) are males and 5 (38.46%) are females. 3 (27.27%) out of the 11 Vocational and Certificate holders are males, 8 (72.73%) females. The 2 (100%) HND respondents are males; 6 (85.71%) out of the 7 respondents with other educational levels (such as O and A levels, MSLC, Form 4) are males and 1 (14.29%) is a female.

Males dominated in most printing houses in Kumasi, making the male respondents about three quarters of the total respondents. 61.54% of the Vocational and Technical graduates were however females. The printing industry is generally more attractive to the males because it demands a lot of physical strength and even the female respondents were all working in either the prepress or post-press.

Details of the chart are in Appendix 1.

Fig. 4.3: Areas of operations

	JHS	SHS	Voc. & Tech.	Cert. & Diploma	HND	Degree	Others	Total
■ Prepress	0	5	1	2	2	1	1	12
■ press	7	6	3	1	0	0	3	20
■ Post press	1	3	7	0	0	0	2	13
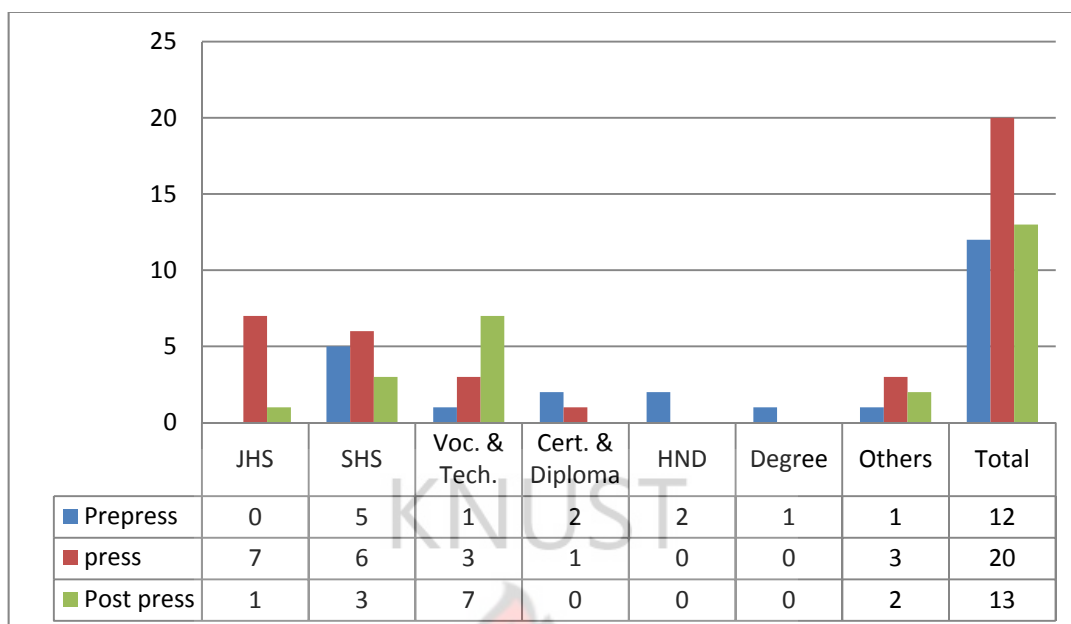
From Fig. 4.3 above, 12 (26.67%) out of the total 45 respondents work in the prepress section, 20 (44.44%) in press section, and 13 (28.89%) in the post press section. The 2 (100%) HND holders and the only degree holder, all work in the prepress section. In contrast 7 (87.5%) of the 8 JHS and 6 (42.86%) of the 14 SHS graduates work in press section, 1 (12.5%) works in the post press section. 3 (50.0%) of the 6 other certificate holders work in the press section and 2 (33.33%) work in the post press section.

Personnel with higher educational levels (HND and degree holders) are employed in the prepress section whereas all (100%) of the personnel in the press and post press sections have neither obtained a higher national diploma nor a degree. The HND and degree holders are employed based on both their computer skill (in Adobe Photoshop, Illustrator, Corel Draw, Pagemaker and typing skills mainly) and educational level to make the required critical decisions in design and layout.

The pie chart below shows, in summary, the percentages of respondents who work in the various sections.

Fig. 4.4: Areas of operations
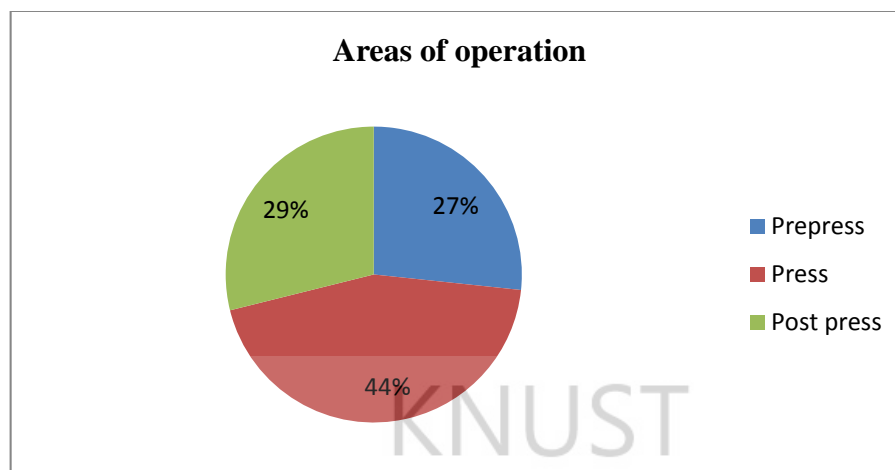
4.2.2 Training acquired

The charts below examine the kind of training programmes and the knowledge acquired by the respondents during their employment, their working experiences, areas of training, years of apprenticeship, and years of training. The analysis will assist the researcher to identify gaps and the need for specific training programmes.

Fig 4.5: Period of apprenticeship

	JHS	SHS	Voc. & Tech.	Cert. & Diploma	HND	Degree	Others	Total
1-6mths	1	2	0	0	0	0	1	4
7mths-1yr	3	3	0	1	0	0	0	7
2yrs-3yrs	4	4	1	1	0	0	2	12
4yrs-5yrs	0	0	0	0	0	0	3	3
Total	8	9	1	2	0	0	6	26
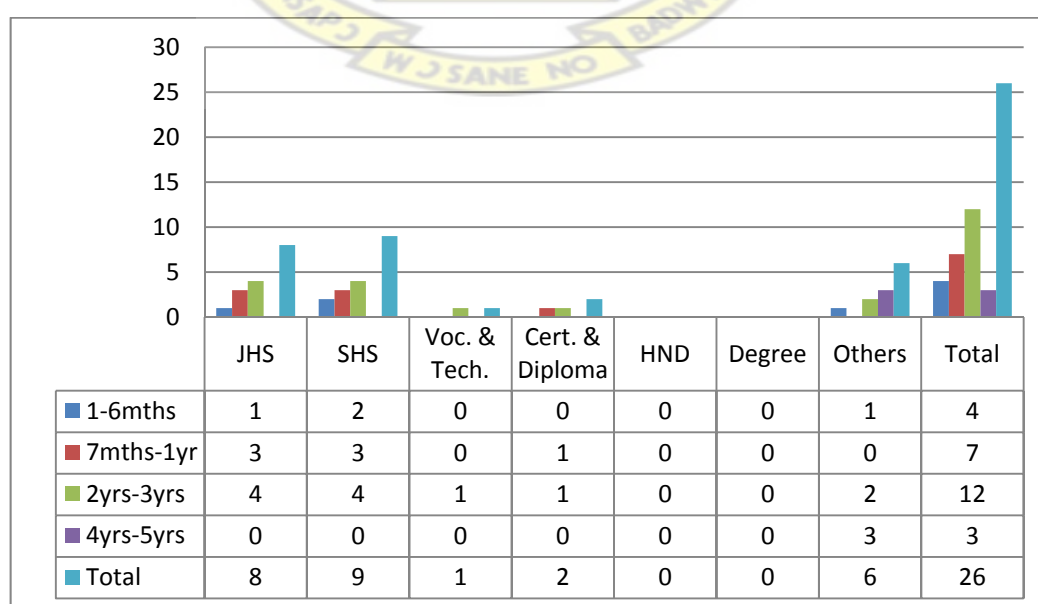
Out of the total 45 respondents, 26 (57.78%) of the respondents learnt the job through apprenticeship (On-the-job training). The other 19 (42.22%) respondents had acquired academic knowledge in printing before being employed. 7 (26.92%) out of the 26 personnel learnt their apprenticeship between 7 months to one year, 12 (26.67%) between two to three years, and the remaining 3 (11.54%) between four to five years. Also, 8 (30.77%) of the 26 were JHS graduates and 9 (34.62%) were SHS graduates.

The above facts affirms that apprenticeship is the key means of training personnel in the Printing Industry and most personnel 23 (88.46%) of 26 had a maximum of 2 to 3 years period of apprenticeship. None of the degree and the HND holders had had any form of apprenticeship.

The frequency distribution table below gives a summary of the number of years of apprenticeship of respondents. The table is extracted from Fig. 4.5.

Table 4.1: The number of years of apprenticeship

Class limits	Class boundaries	Frequency (f)	Midpoints (x)	f*x
1-6mnths	0.1yrs-0.5yrs	4	0.3	1.2
7mnths-1yr	0.5yrs-1.5yrs	7	1	7
2yrs-3yrs	1.5yrs-3.5yrs	12	2.5	30
4yrs-5yrs	3.5yrs-5.5yrs	3	4.5	13.5
		n = 26		Total = 51.7

Midpoints = Lower class boundary + Higher class boundary
                              2

Mean (average) = sum of f*x
                            n

Mean (average) = 50.7/26 = 1.988 ≈ 1.10years

Hence, the average number of years of apprenticeship of respondents is 1year, 10 months. The question is whether this average time period of training is sufficient for such an industry which is technically demanding and technologically under constant change internationally and even in recent years in Ghana also. Averagely, it would have been learnt for 3 years in a technical school, so comparing there is a knowledge gap of 1 year, 2 months that the researcher sees that through various forms of training knowledge, skills and abilities levels could be upgraded in the industry to supplement those who learnt through apprenticeship.

Fig 4.6: Working experience

	JHS	SHS	Voc. & Tech.	Cert. & Diploma	HND	Degree	Others	Total
1yr-2yrs	2	3	1	0	0	0	0	6
3yrs-4yrs	0	4	3	1	1	0	0	9
5yrs-6yrs	3	2	2	0	0	1	0	8
7yrs-8yrs	1	3	3	0	0	0	0	7
9yrs-10yrs	1	1	1	0	0	0	2	5
11yrs & above	1	0	1	2	1	0	5	10
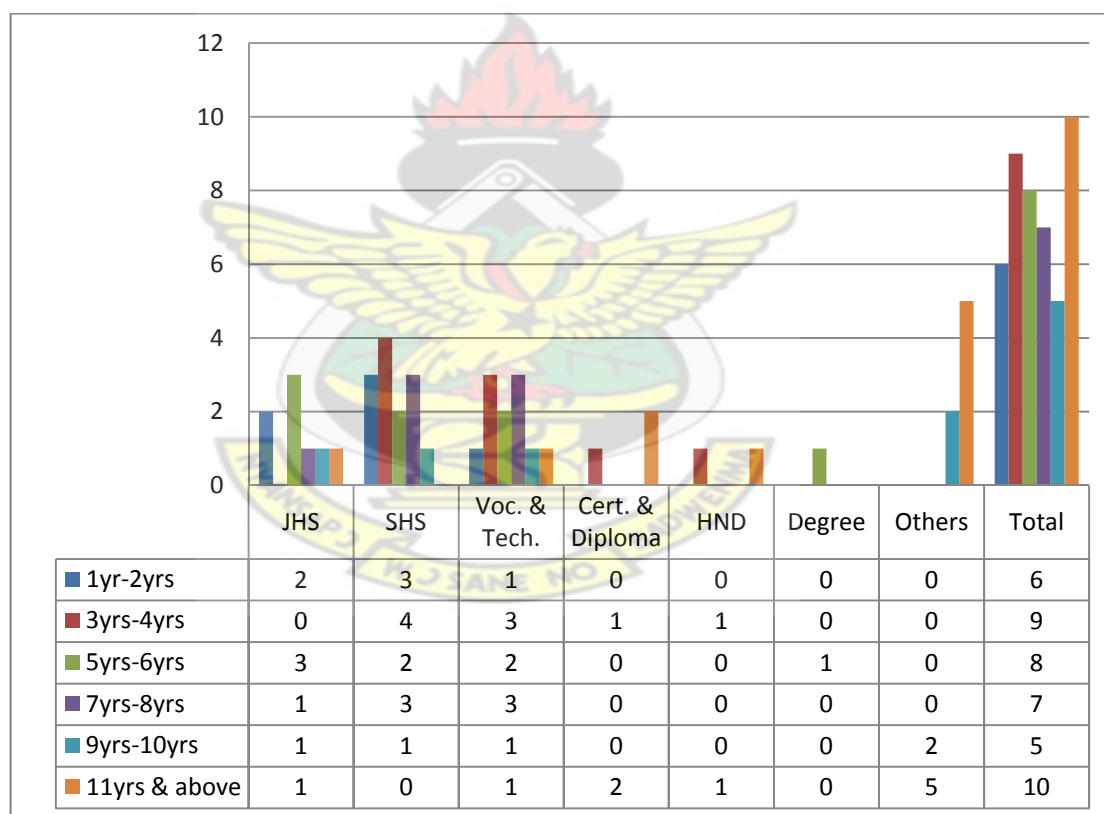
Out of the total 45 respondents, 6 (13.33%) have had working experience between one to 2 years, 9 (20%) between three to four years, 8 (17.78%) between five to six years, 7 (15.56%) between seven to eight years, 5 (11.11%) between nine to ten years, and 10 (22.22%) eleven years and above.

From Fig. 4.6 above majority of the SHS, Certificate and Diploma graduates, and HND holders have their working experiences between 3 years to 4 years whereas those with other qualifications (Form 4, MSLC, etc) had theirs between 11 years and above. This means those with other qualifications are those who have been in the printing industry for a very long time and for that matter have long working experiences, with HND and degree holders being the educational levels with the least working experiences. This suggests that until recently, the printing industry recruited more personnel with other educational qualifications, who obtained their knowledge through on-the-job training (apprenticeship). Details of the chart are in Appendix 2.

Fig. 4.7: Areas of training

	JHS	SHS	Voc. & Tech.	Cert. & Diploma	HND	Degree	Others	Total
Prepress	0	2	2	0	0	1	0	5
Press	2	1	1	1	0	0	2	7
Post press	4	4	1	1	0	0	1	11
Total	6	7	4	2	0	1	3	23
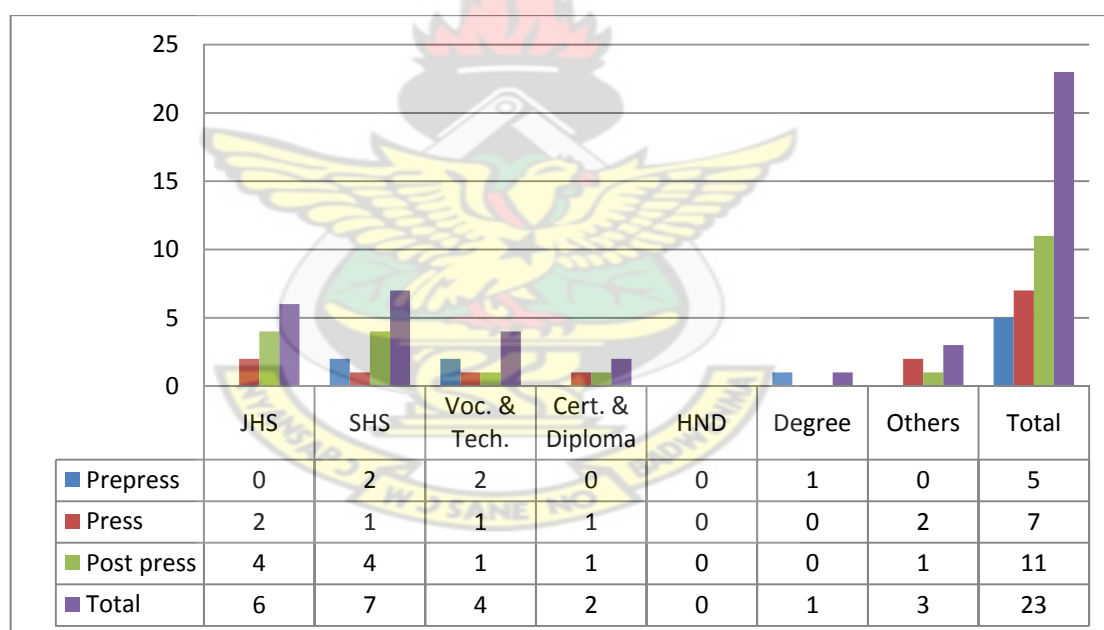
This chart depicts the analysis of respondents in relation to the areas where they have had training. From the chart, 23 (51.11%) of the respondents have undergone different forms of training—prepress, press, and post press: 5 (21.74%) in prepress, 7 (30.43%) in press, and 11 (47.83%) in post press. 6 (26.09%) of the 23 were JHS graduates, (30.43%) were SHS graduates, 4 (17.39%) were Vocational and

Technical school graduates, 2 (8.70%) were certificates and diploma holders, 1 (4.35%) degree holder, and 3 (13.04%) were with other qualification.

During the data gathering, it was discovered that some respondents had their training in a different area but they worked in a different area demanding different skills.

For instance personnel in the prepress and press sections were required to assist personnel in the post-press section whenever there was more work. This was often the case in the post-press section. It means personnel are employed not only to work in their specialized areas but are suppose to work in other sections where more hands are needed whenever the needs arises. This explains why, to some extent, the principle of specialization is not at work at the printing presses in Kumasi based on the data collected.

Fig. 4.8: Period of training

	JHS	SHS	Voc. & Tech.	Cert. & Diploma	HND	Degree	Others	Total
less than a month	1	1	2	1	0	1	2	8
1-6mnth	4	2	1	1	0	0	0	8
7mnths -1yr	1	3	1	0	0	0	1	6
2-3yrs	0	3	0	0	0	0	1	4
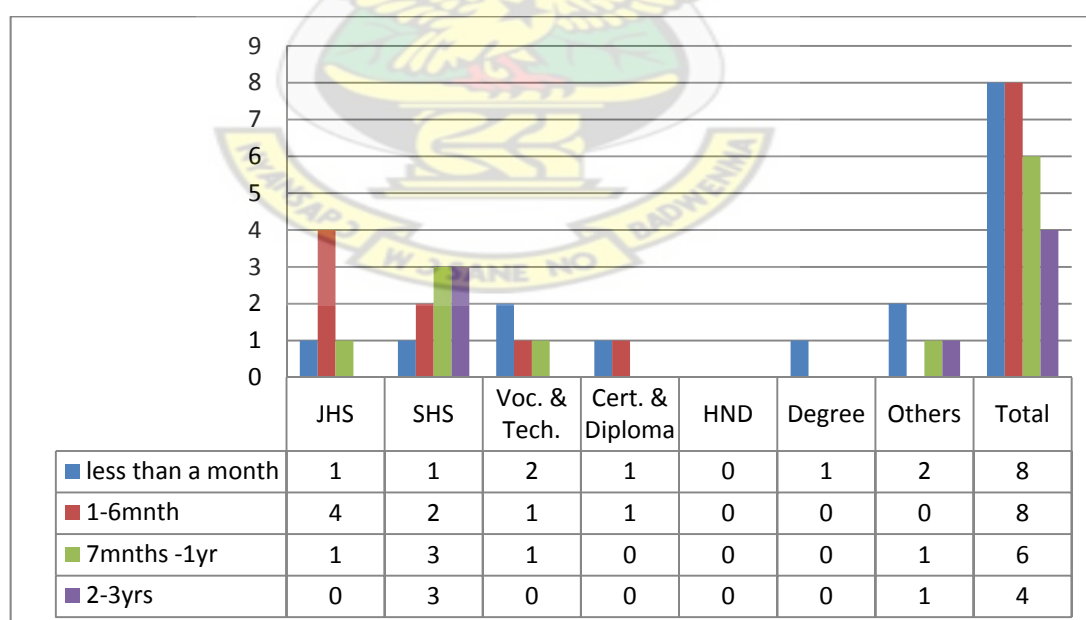
From the chart above, out of 26, 8 (30.77%) respondents had their training either less than a month or between 1 to 6 months, 6 (23.08%) between 7 months to 1

year and 4 (15.38%) between 2 years to 3 years. This explains that even though 51.11% of the respondents (from Fig. 4.7) have undergone different forms of training in the area of prepress, press, or post press, yet the training was short-term training courses (either less than a month or between 1 to 6 months). Further details and the areas respondent received training are in Appendix 2.

4.2.3.1 Basic (Essential) skills

The basic skills are indispensable to all work types, and should be possessed by all workers irrespective of the area of operation—either prepress, press or post press section.

Fig. 4.9: Basic (Essential) skills of respondents
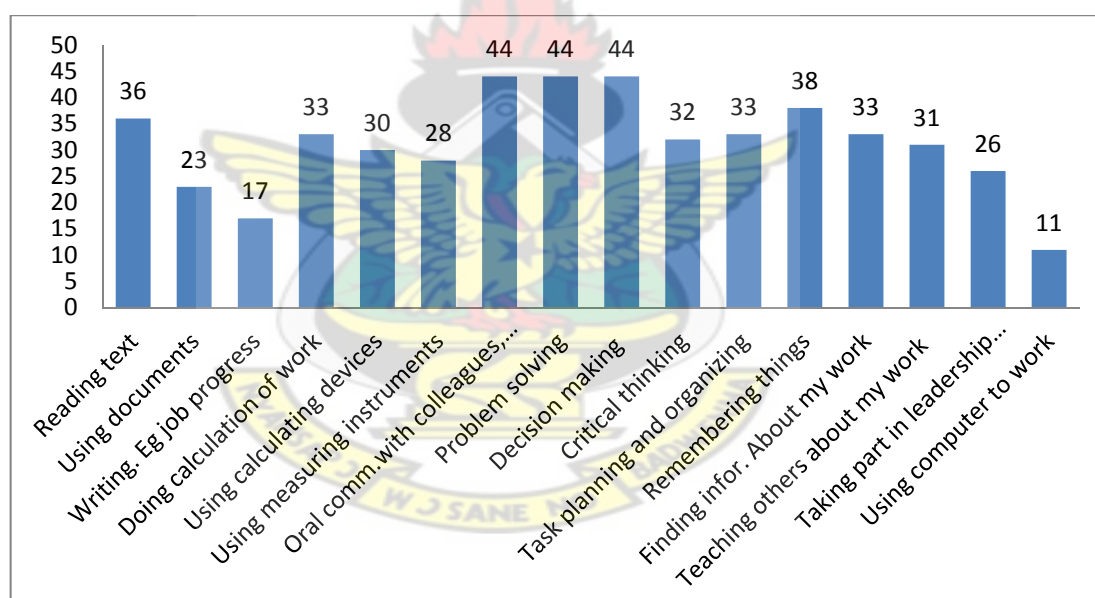
The above chart illustrates the analysis of the respondents who possess the basic or essential skills in their areas of operations in comparison with standards. Details of the chart and standards on basic (essential) skills are in Appendix 3.

From the chart, 36 (80%) of the respondents read text from manuals, brochures, customers' works, etc; Out of the 36, 20 (55.56%) consider reading to be

less difficult, 32 (88.89%) regard reading to be an important part of their work, 18 (50%) frequently read text.

According to CPISC (2009) standards on basic (essential) skills, employees are required to read simple and brief work-related materials to perform routine tasks such as reading safety procedures, read notes from co-workers or supervisors on previous shifts and from staff in other departments about jobs status, equipment faults and specification changes among others. The percentage (80%) suggests *20% gap*. The standard should 100% reading as a basic skill for each employer. To meet international competition a short training courses for the industry would be helpful.

Twenty-three, representing 51.11% of the respondents use documents such as job docket; Out of the 23, 20 (86.96%) consider using documents to be less difficult, 22 (95.65%) regard using documents to be an important part of their work, and 14 (60.87%) frequently use documents such as manuals, customers' works, etc.

Seventeen, representing 37.78% of the respondents write, e.g. writing job progress, problems noticed while working, new techniques learnt, etc; Out of the 17, 12 (70.59%) consider writing to be less difficult, 14 (82.35%) regard writing to be an important part of their work, and 11 (64.71%) write frequently.

Writing skills standards require employees to communicate in writing to ensure information and messages are clear and easy to understand; writing short notes (e.g., comments, memos); applying basic rules of spelling, grammar and punctuation; completing company forms (e.g., inventory records, labels, order forms, work instructions, dockets, invoices, production forms [CPISC, 2009]). With only 37.78% writing there is a huge gap of 62.22% that requires upgrading to standard.

Thirty-three, representing 73.33% of the respondents do calculations of work such as paper, plate, time, etc; Out of the 33, 21 (63.64%) consider calculations of

work to be less difficult, 31 (93.94%) regard calculations of work to be an important part of their work, and 26 (78.79%) frequently do calculations of work.

Mathematical or calculation standard skills require employees to complete basic calculations such as additions, subtraction, multiplication, and divisions using whole numbers and decimals (e.g., to determine quantity of materials); Calculating percentages (e.g. percentage of overs); Convert units of measurement (e.g., metric to imperial) in production process (CPISC, 2009). The study reveals that over 70% of the employees have this skill, which is better in comparison to reading, and writing skills.

Thirty, representing 66.67%, of the respondents use calculating devices such as calculator, paper and pen; Out of the 30, 22 (73.33%) consider using calculating devices to be less difficult, 27 (60 %) regard using calculating devices to be an important part of their work, and 20 (44.44%) frequently use calculating devices.

Twenty-eight, representing 62.22% of the respondents use measuring instruments such as units, charts, rulers, etc.; Out of the 28, 21 (75%) consider using measuring instruments to be less difficult, 26 (92.86%) regard measuring instruments to be an important part of their work, and 19 (67.86%) frequently use measuring instruments.

Forty-four (97.78%) of the respondents communicate orally with colleagues and management; Out of the 44, 30 (68.18%) consider oral communication to be less difficult, 42 (95.45%) regard oral communication to be an important part of their work, and 39 (88.64%) frequently use oral communication.

According to CPISC (2009), employees are expected to follow verbal instructions; listen without interruption; ask questions to seek clarification; present information in a clear manner; use standard trade terms and work-related

terminology. Communication skills are one of the top basic skills that are possessed by the employees. There is no significant difference from the data, quantitatively, between the standard communication skills and the actual communication skills.

Forty-four, representing 97.78% of the respondents solve problems; 19 (43.18%) of the 44 consider problem solving to be less difficult, 43 (97.73%) regard problem solving to be an important part of their work, and 18 (40.91%) averagely solve problems frequently.

The standard problem solving skills require employees to identify and solve basic problems using available information to assess situations, identifies the problem based on a limited number of basic factors; select solutions to basic problems, considering predefined options and using clear procedures; identifying straightforward and practical solutions when predefined solutions are not applicable (CPISC, 2009). It is clear that problem solving skills in such a technical industry needs to be upgraded since problem solving is difficult for 56.82%.

Forty-four, representing 97.78% of the respondents involved themselves in the decision making process; Out of the 44, 20 (45.45%) consider decision making to be averagely difficult, 41 (93.18%) regard decision making to be an important part of their work, and 27 (61.36%) on the average frequently involved in decision making.

Making decisions involve varied levels of risk and ambiguity. The standard decision making skills require that employees make decisions in a timely manner; apply guidelines and procedures in making decisions (CPISC (2009). Employees are not deficient with these skills as portrayed by the percentage (97.78%).

Thirty-two, representing 71.11% of the respondents do critical thinking; Out of the 32, 18 (56.25%) consider critical thinking not to be a difficult task, 27

(84.38%) regard critical thinking to be an important part of their work, and 16 (50 %) frequently do critical thinking.

Thirty-three, representing 73.33% of the respondents do task planning and organizing; Out of the 33, 25 (75.76%) consider task planning and organizing not to be a difficult task, 27 (81.8%) regard task planning and organizing to be an important part of their work, and 23 (69.70%) frequently do task planning and organizing.

The standards require employees to develop, set and adjust plans and priorities to achieve maximum productivity. Employees are expected to Organize work area to ensure optimal efficiency; meet deadlines; produce work plans and work schedules; take appropriate action to ensure adequate supplies and materials are available (CPISC, 2009). From the analysis, about 30% of the employees do not plan and organize their work which affects the optimal productivity level of the printing presses. This 30% gap can be addressed through some form of training.

Thirty-three, representing 73.33% of the respondents find information about their work; Out of the 33, 16 (24.24%) consider finding information about their work to be a less difficult task, 30 (90.91%) regard finding information about their work to be an important part of their work, and 17 (51.52%) averagely find information about their work.

Thirty-one, representing 68.89% of the respondents teach others about their work and learning new ways about their work; Out of the 31, 19 (61.29%) consider that to be a less difficult task, 29 (93.55%) regard that as important part of their work, and 17 (54.84%) less frequently teach others and learn new ways about their work.

Twenty-six, representing 57.78% of the respondents take part in leadership activities; 12 (46.15%) of them consider it as averagely difficult to do, 25 (96.15%)

regard finds it important part of their work, and 14 (53.85%) frequently take part in leadership activities.

Eleven, representing 24.44% of the respondents use computers to work; 8 (72.73%) of them consider using computers to work to be a less difficult task, all 11 (100%) regard that an important part of their work, and they frequently use computers to work.

In accordance with CPISC (2009) standards on computer literacy, employees should be able to use computer software and computerized equipment to routinely perform basic production tasks electronically; enter basic information in databases; retrieve information from databases or internal systems; communicate electronically; search the internet for product, industry or client information.

4.2.3.2 Discussion on the basic skills

From the analysis and discussions above, it is obvious that almost all of the respondents acknowledge the basic (essential) skills as important part of their work, but do not possess and/or implement them in their work. The least basic skills possess by the respondents are the computer, writing, and using document in that order. The trend of low record-keeping style of operating, makes new workers repeat similar or the same errors and/or problems during work operations in the case that the predecessor is not available? Academia can ponder over these with all stakeholders in the industry.

Writing daily experiences encountered during working hours, such as writing progress of work, problems noticed, new techniques learnt, and using documents such as job records, job docket, estimation sheets for keeping customers' records and for references are not fully put into practice. It's time to address this gap.

More than half (56.82%) of respondent consider problem solving difficult, and yes it is, although almost all consider possessing that skill as an important part of their work. Surely, this gap needs to be bridged as the research points out clearly.

In the printing presses, apprenticeship is a very common way of equipping new workers for the industry. So equipping the workers to gain KSA in finding new information about the work and impacting that knowledge with some easiness would help them enjoy doing that and eventually help them equip more future stakeholders in the industry. Also, half (50%) of even those who consider reading an important part of their work do not read those texts frequently and the researcher sees that as a call for concern.

Critical thinking is skilled and active interpretation and evaluation of observations and communications, information and argumentation (Fisher and Scriven, 1997). In other words critical thinking is identifying an idea, analysing and evaluating it and coming into the best strategic conclusion on it. In managing and solving crisis situations the industry cannot advance without innovation and invention to solve problems. It is rather unfortunate that out of 45 respondents, only 27 (60%) sees it as important part of their work. There is a clear gap of 18 (40%) that needs to be helped.

The frequency distribution table below summarises averagely, the basic (essential) skills possess by the respondents.

Table 4.2: The basic (essential) skills possess by the respondents

Number of Basic Skills	Basic (Essential) Skills	No. of Respondents possessing it
1	Reading text	36
2	Using documents	23
3	Writing. E.g. job progress	17
4	Doing calculation of work	33
5	Using calculating devices	30
6	Using measuring instruments	28
7	Oral communication with colleagues Management	44
8	Problem solving	44
9	Decision making	44
10	Critical thinking	32
11	Task planning and organizing	33
12	Remembering things	38
13	Finding information about my work	33
14	Teaching others about my work	31
15	Taking part in leadership activities	26
16	Using computer to work	11
		Total = 503

Mean (average) = sum of values of basic skills of respondents

total number of basic skills

Mean (average) = 503/16 = 31.4375 ≈ 31 respondents

The interpretation of the average is that, out of the 45 respondents, 31 (68.89%) have the basic skills. This means that about 70% of the personnel in the printing presses in Kumasi have these basic skills, even though they all acknowledge the significance of these skills in their work. This is contrary to the standard skills developed by HRSDC and CPISC which expect every personnel in the printing industry to possess these skills irrespective of their areas of operations. That is a gap.

4.2.4 Core skills and attitudes

Core skills are those that constitute a broad knowledge of the industry. Some may be more relevant to a particular process though. They include: teamwork, health and safety, printing process, workflow process and control, quality assurance and customer service. All employees require them as the foundational skills in relation to their areas of operation.

Fig. 4.10: Core skills and attitudes
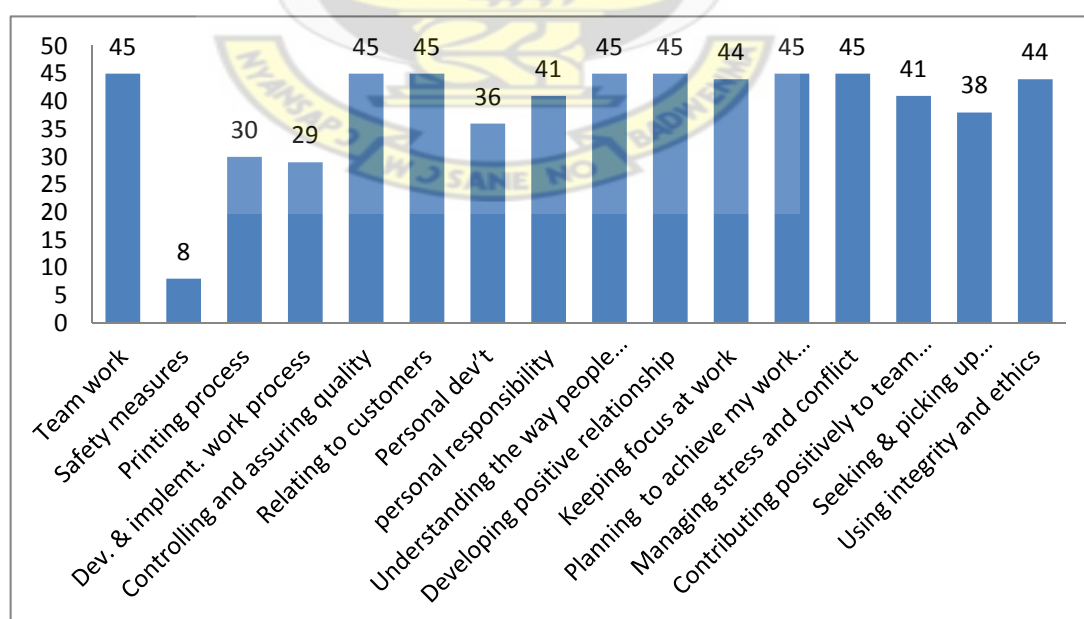
The chart above shows the breakdown of the respondents who possess the core skills and attitudes in their areas of operations. Details of the chart are in Appendix 4.

From the chart, all (100%) of the respondents involve themselves in a team work in achieving their work goals; Out of the 45, 30 (66.67%) consider team work to be less difficult, 40 (88.89%) as an important part of their work, and 25 (55.56%) frequently involve themselves in team work.

CPISC (2009) standards on teamwork require employees to work collaboratively with others to achieve organizational goals. Employees are expected to deal honestly and fairly with others, respect for individual differences; share all relevant information with others; collaborate with others from other functional areas; consult team members when inconsistencies or errors are found; handle conflicts in an effective manner; support the development of others through on-the-job training. Although generally, all of the respondents involve themselves in team work, 55.56% frequently involve themselves in team work.

Eight, representing 17.78% of the respondents follow health and safety measures; Out of the 8, 6 (75%) regard following health and safety measures is not difficult, 7 (87.5%) regard following health and safety measures as an important part of their work, 5 (62.5%) frequently follow health and safety measures.

CPISC (2009) standards on health and safety measures expect employees to maintain a healthy and safe working environment to prevent injury and/or losses (e.g., remove waste, clean tools, and prevent spills); adhere to health and safety and environmental standards, regulations and policies. Employees are expected to maintain tools and equipment in safe working conditions; wear personal protective equipment to prevent injury. The analysis reveals that health and safety measure standards are least followed in all the printing presses in Kumasi. Only 17.78% of all

the respondents actually follow health and safety measure standards and 62.5% frequently follow health and safety measures. The gap requires redress.

Thirty, representing 66.67% of the respondents have knowledge about the printing processes work; Out of the 30, 13 (43.33%) believe that the printing processes are less difficult to understand, all (100%) regard the understanding of the printing processes as an important part of their work, 26 (86.67%) frequently apply the printing processes.

The standard requires employees to have a basic understanding of the printing industry; demonstrate basic understanding of the steps involved in the printing processes; identify the basic pre-press, press, and post-press operations; demonstrate in-depth knowledge of the printing industry; educate others in the operations of the printing company among others (CPISC, 2009). Only 66.67% have certain level of understanding and knowledge about the printing processes and the industry as a whole although standards say all should. Their understanding and knowledge, from the data gathering, were only limited to their areas of their operations.

Twenty-nine, representing 64.44% of the respondents have develop and implement work process; 12 (41.38%) of the 29 believe that developing and implementing work process is not difficult, 22 (75.86%) regard it as an important part of their work, 18 (62.07%) frequently develop and implement work process.

All 45 (100%) of the respondents control and assure quality of work; 26 (57.78%) regard it as not difficult, 43 (95.56%) regard it as an important part of their work, 18 (40 %) frequently control & assure quality of work.

The quality assurance and control standards require employees to verify accuracy and quality of work to ensure that products meet expectation; materials and

consumables meet requirements; check product sample continuously to ensure that it meets initial specifications; report when equipment is not operating correctly and is producing inferior quality work; perform basic preventive and corrective maintenance on equipment (CPISC, 2009). Analysing, all of the respondents (100%) control and assure quality of work and 95.56% see controlling and assuring quality of work as an important part of their work. That means 4.44% of respondents do not see the importance of quality assurance and control of work, and therefore practice quality assurance out of compulsion. This is the reason why only 40% of the respondents frequently control and assure quality of work. The 60% is a gap that needs to be trained.

All 45 (100%) of the respondents relate to customers one way or the other; 22 (48.89%) regard it as not difficult, 43 (75.86%) regard that as an important part of their work, 21 (46.67%) frequently relate to customers.

Thirty-six, representing 80% of the respondents strive for personal development; 14 (38.89%) regard that as difficult, 35 (97.22%) regard that as an important part of their work, 17 (47.22%) frequently strive for personal development.

Forty-one, representing 91.11% of the respondents take personal responsibility to resolve problems; 17 (41.46%) finds that averagely difficult, 38 (92.68%) regard that as an important part of their work, 17 (41.46%) frequently practice that. A gap of 58.54% of the respondent does not practice that frequently and needs upgrade.

All 45 (100%) of the respondents plan how to achieve their work and personal goals; 18 (40%) believe doing it is less difficult, 40 (88.89 %) regard it as an important part of their work, and 19 (42.22%) frequently do that.

All 45 (100%) of the respondents are able to manage stress and conflict; 20 (44.44%) finds that difficult, 39 (86.67%) regard that as an important part of their work, 17 (37.78 %) sometimes manage stress and conflict.

Forty-one, representing 91.11% of the respondents contribute positively to team work and company morale and spirit; Out of the 41, 21 (51.22 %) believe that is less difficult, 39 (95.12 %) regard contributing that as an important part of their work, 26 (63.42 %) frequently contribute positively to team work and company morale and spirit.

Thirty-eight, representing 84.44% of the respondents seeks and picks up responsibility; 22 (57.89 %) regard that as less difficult, 36 (94.74%) regard that as an important part of their work, 18 (47.37%) frequently seek and pick up responsibility.

4.2.5 Further discussions

The breakdowns show although the respondents fairly possess other core skills, the least possessed core skill is "health and safety measures". Only 17.78% of the respondents follow health and safety measures during working hours. Considering the health hazards in printing, an urgent redress is needed.

One-third of the respondents do not have knowledge about the printing processes. The researcher finds this worrisome for an industry competing with foreign competitors who produce quality at cheaper prizes. Each worker must have the basic knowledge of all the processes in order to function effectively and efficiently as a team member and a complement for each other.

It is alarming that over 40% (19 out of 45) of the respondents find controlling and assuring quality of work difficult and only 40% does it. There is a huge gap here.

When respondents were asked whether they strive for personal development, 97.22% regard that as important but only 47.22% frequently strive to develop themselves personally. The initiative for self-upgrade in the KSA's is clearly not the attitude of many, they rely on the knowledge gained from long-term experiences.

Working with a working plan saves a lot of time and makes delivery more efficient but almost 60% of the respondents do not practice that at work. The researcher regards this to be an area needing training immediately.

The frequency distribution table below shows the average core skills and attitudes possessed by the respondents.

Table 4.3: The core skills and attitudes

No. of Core Skills And Attitudes	Core Skills and Attitudes	Frequency
1	Team work	45
2	Health &Safety measures	8
3	Printing process	30
4	Developing. & implementing work process	29
5	Controlling and assuring quality	45
6	Relating to customers	45
7	Personal development	36

8	personal responsibility	41
9	Understanding the way people feel	45
10	Developing positive relationship	45
11	Keeping focus at work	44
12	Planning to achieve my work and personal goals	45
13	Managing stress and conflict	45
14	Contributing positively to team work	41
15	Seeking & picking up responsibility	38
16	Using integrity and ethics	44
		Total = 626

Mean (average) = $\dfrac{\text{Sum of Values of Core Skills and Attitudes}}{\text{Total Number of Core Skills and Attitudes}}$

Mean (average) = 626/16 = 39.125 ≈ 39 respondents

This means that out of the 45 respondents, 39 (86.67%) of them have core skills and attitudes. Although the respondents fairly possess the core skills when compared with the basic or essential skills, it is still below the standard set by HRSDC and CPISC which expect all personnel in the industry to have all of them.

The above analyses show clear gap between the skills possessed and the standard skills expected of each employer. Developing a programme to equip the industry with these needed skills and motivating them to implement the skills more frequently would go a long way to advance the standard of work done and workers health and safety in the printing presses.

4.2.6 Operating skills

Operating skills are specialised skills that are expected to be possessed by personnel in the prepress, press, and post press sections. No matter the type of press, all press operators must acquire specific operating skills to perform their duties.

4.2.6.1 Prepress operation skills

Out of the 45 respondents, 12 (26.67%) work in the prepress section. See details in Appendix 5. The chart below shows that the least prepress operating skills possessed by respondents are developing plates, developing films, and proofing and preparing camera-ready version skills. None of the respondents has the skill of developing plates and only 5 (41.67%) possess the skill of developing films. During data gathering, it was observed that 4 (of the 8) presses did not have in-house imagesetter and plate-burning machine for developing films and plates, and therefore have to subcontract theses activities to other presses. In the other 4 presses, not all workers were available and/or accessible to the researcher.
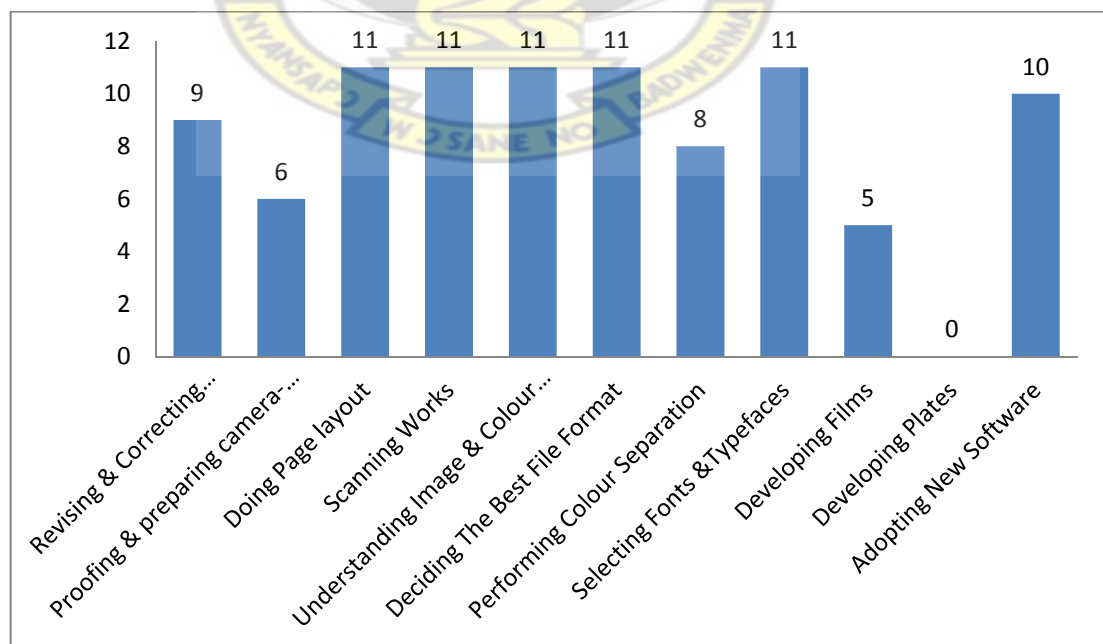
Fig. 4.11: Prepress operation skills

According to the frequency distribution table below, averagely 9 (75%) of the 12 respondents who work in the prepress section have all the prepress operational skills which lives a gap of 25% that needs redress through training.

Mean (average) = Sum of Values of Prepress Skills

Total Number of Values of Prepress Skills

Mean (average) = 93/11 = 8.4545455 ≈ 9 respondents

Table 4.4: The prepress skills of respondents

No. of Prepress Skills	Prepress Operational Skills	Frequency
1	Revising & Correcting Customers' Work	9
2	Proofing & preparing camera-ready version	6
3	Doing Page layout	11
4	Scanning Works	11
5	Understanding Image & Colour resolutions	11
6	Deciding The Best File Format	11
7	Performing Colour Separation	8
8	Selecting Fonts &Typefaces	11
9	Developing Films	5

10	Developing Plates	0
11	Adopting New Software	10
		Total = 93

4.2.6.2 Press operation skills

Press operating skills include such basic operations such as preparing ink and inking systems, monitoring colour quality and performing wash-up, as well as operating skills pertaining to a particular type of press such as lithographic sheet- and web-fed, flexographic or digital.

Out of the total respondents, 20 (44.44% [from Fig 4.3]) work in the press section. From the chart below, most of the personnel in the press section possess adequate press operating skills. The press operating skills that are least possessed are the ink preparation and washing up machine skills.

Fig. 4.12: Press operating skills
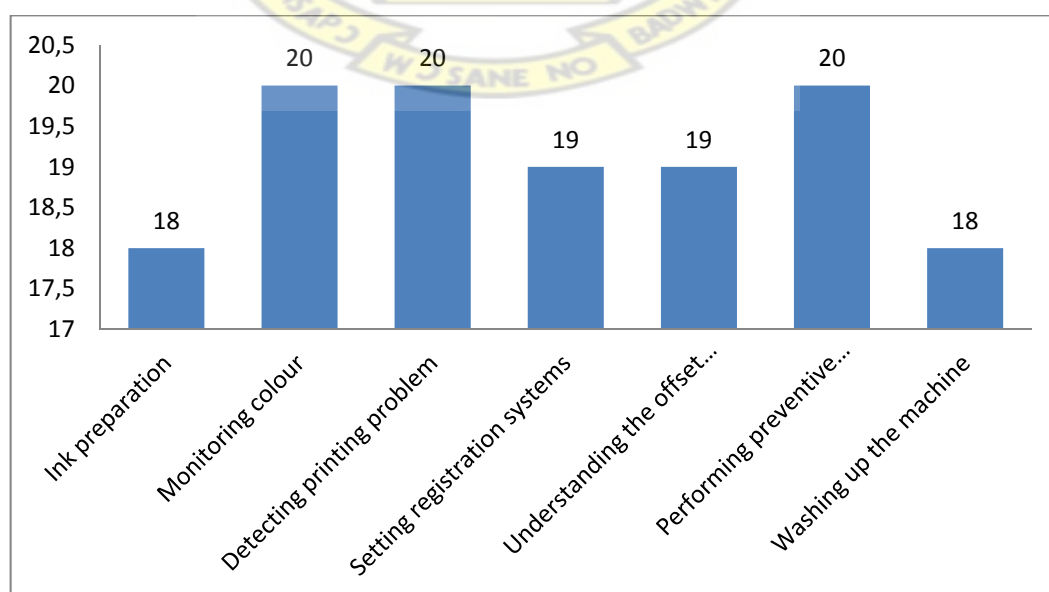
Understanding ink preparation implies having knowledge of: colour book matching, basic parts of the inking system and their functions, (e.g., ink fountains, fountain ball, etc.); Principles of four-colour printing, effects of alternative colour sequences on final product; conditions affecting accurate colour matching and overall quality (e.g., light source, colour quality, etc) (CPISC, 2009). It is clear that the actual understandings of ink preparation possessed by the respondents are low and is one of the reasons why most of the printed products quality is not up to standards. One of the key factors that affect the quality of print is ones knowledge in colour matching and the principle of inking system and their functions. It is clear that how well the machine is washed up to prepare to print a different colour also affected the final quality and 90% of the respondents possessed this skill and knowledge.

From the frequency distribution table below the average respondents possessing the prepress operating skills is:

Mean (average) = Sum of Values of Press Operating Skills
Total Number of Values of Press Operating Skills

Mean (average) = 134/7 = 19.142857 ≈ 19 respondents

Table 4.5: The prepress operating skills of the respondents

No. of Press Operating Skills	Press Operating Skills	Frequency
1	Ink preparation	18
2	Monitoring colour	20
3	Detecting printing problems	20
4	Setting registration systems	19
5	Understanding the offset process	19
6	Performing preventive	20

	maintenance	
7	Washing up the machine	18
		Total = 134

This average indicates that 19 (95%) of the 20 personnel in the press section have adequate press operating skills. Although the respondents claim that they have these skills, it was observed that these skills do not reflect the quality of work they produce; the quality of work produced by most presses in Kumasi, by observation, do not meet the quality standard in the industry.

4.2.6.3 Post-press operating skills

All operators must have or acquire specific operating skills to perform their duties. Operating skills for basic operations such as folding, die-cutting/embossing, perforating, stitching, collating, cutting, and laminating are required.

Fig. 4.13: Post-press operating skills
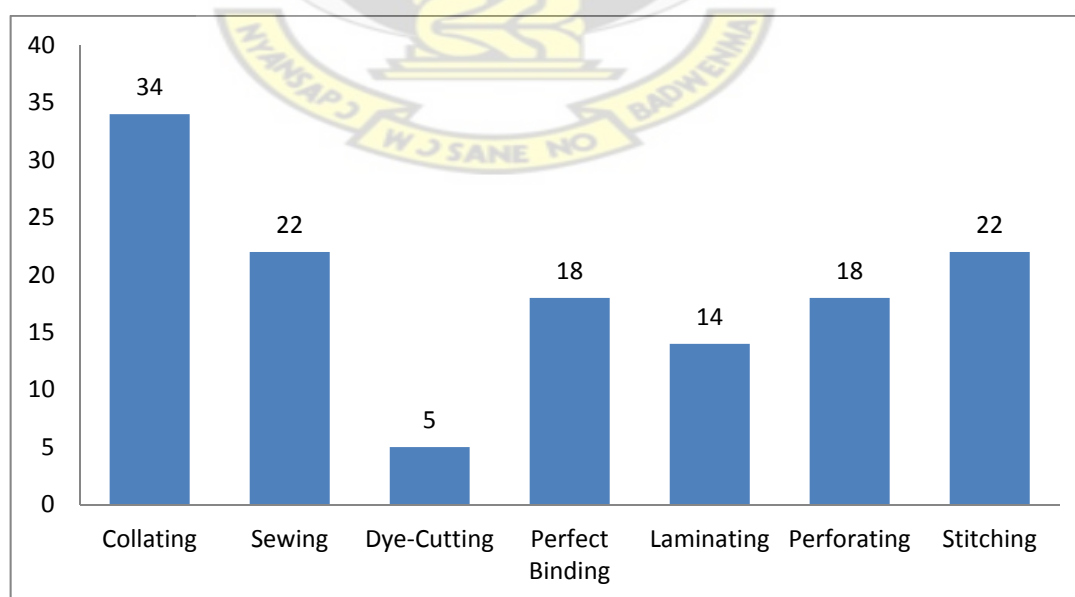
Although (from Fig. 4.4) only 13 (28.89%) of the total respondents work in the post press section, personnel from the other sections possessed post-press

operating skills which account for 34(75.56%) collating or 22 (48:89) personnel stitching. The least post-press skill possessed by the personnel is dye-cutting skill. This is because most printing presses in Kumasi do not have dye-cutting machine.

The chart above gives a pictorial analysis that printing presses in Kumasi do not employ personnel with the requisite expertise to work in their post press sections, unlike personnel employed at their prepress and press sections, but mostly do on-the-job training. This can be attributed to the perception that post press activities do not require personnel with expertise to handle them. This is also the reason why personnel with low educational level are mostly employed in the post-press sections.

The table shows the average post-press operating skills. Details are in Appendix 7.

Mean (average) = Sum of Values of Post-press Operating Skills

Total Number of Values of Post-press Operating Skills

Mean (average) = 133/7 = 19 respondents

This means that the average respondents who possess the post-press operating skills are 19 (42.22%).

Table 4.6: The post-press operating skills

No. of Post Press Operating Skills	Post Press Operating Skills	Frequency
1	Collating	34
2	Sewing	22
3	Dye-Cutting	5
4	Perfect Binding	18
5	Laminating	14

6	Perforating	18
7	Stitching	22
		Total = 133

4.3 Effective training delivery methods for the printing industry

As made clear in the literature review the aim of the training delivery methods are to bridge the gap between the standard skills and the actual skills possessed by employees in the printing industry through different learning processes; the delivery methods are not results themselves but are means to achieve results. They are meant to build and develop skills capacity of employees.

The data obtained and the analysis made above helped established the actual skills, abilities, and knowledge levels possessed by employees and comparing each with the standard required skills that are relevant to prepress, press and post-press sections of the printing industry. On the researcher's objective to find out which training delivery methods are effective for the printing industry.

The researcher through interview with the managers of 10 of the 12 initially selected presses, 8 neither have any training policy document nor conduct training needs assessment. They also do not have any long-term policies for upgrading workers and/or to recruit skilled labour.

One press had a training policy document but it is not used. The document could not be traced neither could any specific details be obtained. According to the manager, he has plans of revising the document and put it to use. Nevertheless, the

presses neither conduct training needs assessment nor have long-term policies for upgrading workers and/or to recruit skilled labour.

One press, the University Press Kumasi, had no separate training policy document for the press, but training and recruitment were subject to the policy of the University under the Human Resource Department. The training policy, according to the manager, states that before either a junior or senior staff would be recommended for training, he/she should have served for a number of five or more years before granted permission to do so and must be approved by the Vice Chancellor. The only thing the press can do is to organize an in-house training for the workers but long-term training policies are undertaken by the university. He also said that the press does not undertake any training needs assessment.

Although, the printing presses do not have training policies and mainly used on-the-job training through apprenticeship with discussions and demonstration approach, the researcher would make recommendations of most effective delivery methods for the industry in the next chapter based on the literature review.

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CHAPTER FIVE
CONCLUSION AND RECOMMENDATIONS

5.1   Conclusion

The printing industry requires both technical skills and general skills. This skills needs to be upgraded to standard to reflect on the quality of production. Developing and strengthening the three main aspects of training: knowledge, skills and attitudes would help each individual worker to contribute effectively and efficiently to the printing press and the industry as a whole.

Most of the presses assessed are considered Small and Medium Scale Enterprises employing between 3 and 15 workers, and do not have job description and job analysis document and/or training policies to upgrade the skills, knowledge and attitudes of workers. It is clear that there is the need for various forms of training to be in place for upgrading knowledge, skills and abilities of employees in the industry.

The skill gaps identified are for prepress operating skills 25% of the workers working there, press operating skills 5% and post-press operating skills 51.78%. The specific KSA gaps identified are safety and healthy 37 (82.22%) out of 45, printing processes 15 (33.33%), difficulty in controlling and assuring quality 18 (40%); writing skills, document usage, computer skills, record keeping, finding information to solve problems and critical thinking all averaging 30% of the respondent; performing colour separation 4 (33.33%) out of 12 workers, and dye-cutting 11.11%

A combination of non-formal training models both on-the-job and off-the-job training methods would needs to be employed to fill the KSA gaps identified in the analysis of the research findings.

5.2 Recommendations

Ghana Printers and Paper Converters Association (GPPCA) in collaboration with Academia and labour agencies could be empowered to develop and promote standards that would regulate training programmes.

The Department of Publishing Studies could develop refresher courses for employees addressing the specific KSA gaps. Employers could also be educated to adopt the most effective training methods for their employees by analyzing their training needs and monitor the training at regular intervals.

In order to provide employees with broad understanding of the requisite skills within a department, job rotation training could be adopted since employees will move from one part of the organization to another, assuming specific assignments and job responsibilities at each location.

Employers and the Department of Publishing Studies could conduct regular TNA assessment in order to collect information that can be used to decide the type of training programmes that are relevant to employees in solving performance problems. Assessment enables organizational gaps to be identified and problems solved through training.

Employers could recruit personnel who have obtained knowledge in printing at the tertiary level, especially at the Department of Publishing Studies, based on both their knowledge level and skills.

Employers could ensure that apprentices are able to demonstrate mastery of all required skills and knowledge before they are allowed to graduate to a full employee status. This could be done through testing and certification processes.

Training providers could organize training on areas that are directly related to employees' areas of operation rather than on general areas.

For apprenticeship to provide progressive routes to higher-level skills and qualifications, Supervisors must be well trained and competent to supervise trainees. The researcher strongly recommends the development of a dual education system where Academia would partner with the printing presses that an apprentice comes to lectures and goes to the press for practical work whilst moving through the various sections of the press.

In addition to apprenticeship with lectures and job-rotation, demonstration, and discussion delivery methods are effective as proven by literature for the industry. The goal of job rotation is to provide employees with broad understanding of the relations among functions within a department (Hall & Goodale, 1986). Researchers Salas & Cannon-Bowers (2001); Tannenbaum & Yukl (1992) states that in recent years, organizations have turned towards simulations (or synthetic learning environments) in order to prepare personnel for work in complex and dynamic environments. These simulations have been designed to provide training with information, demonstration, practice and feedback on needed knowledge, skills, and attitudes.

Attitudes such as recording and writing, job planning, taking health and safety measures and ensuring quality at all levels of production can be effectively improved through structured discussions and demonstration with feedback in the view of the researcher.

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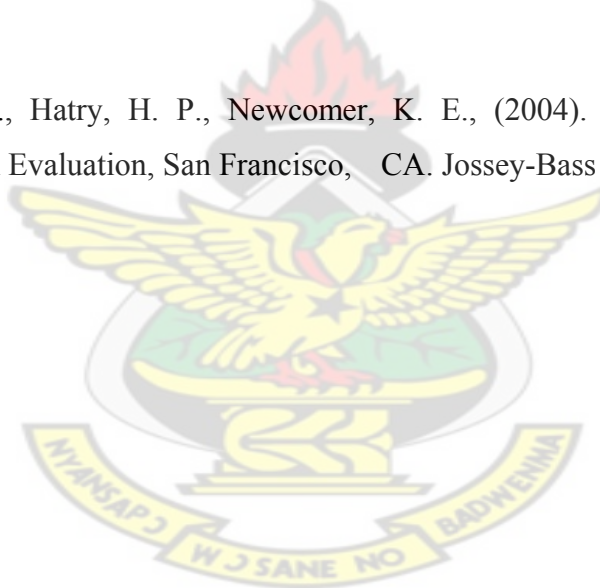
APPENDIX

Appendix 1: Educational Level of Respondent

Educational Level	Gender		Area Of Operation			Learning Method	Years Of Apprenticeship				Working Experience					
	M	F	prepress	press	Post press	Apprentice-ship	1-6mths	7mths-1yr	2yrs-3yrs	4yrs-5yrs	1-2yrs	3-4yrs	5-6yrs	7-8yrs	9-10yrs	11 & above
JHS	8	-	-	7	1	8	1	3	4	-	2	-	3	1	1	1
SHS	9	5	5	6	3	9	2	3	6	-	3	4	2	3	1	-
Vocational And technical	3	8	1	3	7	1	-	-	1	-	1	3	2	3	1	1
Certificate And diploma	3	-	2	1	-	2	-	1	1	-	-	1	-	-	-	2
HND	2	-	2	-	-	-	-	-	-	-	-	1	-	-	-	1
Degree	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-
Others (O and A levels, MSLC, Form 4, etc)	6	1	1	3	2	6	1	-	2	3	-	-	-	-	2	5
Total	32	13	12	20	13	26	4	7	12	3	6	9	8	7	5	10

Appendix 2a: Areas of Training

Educational Level	Gender		Further Training	Area of Training			Period of Training			
	M	F		prepress	press	Post press	Less than a month	1-6mths	7mths-1yr	2-3yrs
JHS			6	-	2	4	1	4	1	-
SHS			7	2	1	4	1	2	3	3
Vocational And technical			4	2	1	1	2	1	1	-
Certificate And diploma			2	-	1	1	1	1	-	-
HND			-	-	-	-	-	-	-	-
Degree			1	1	-	-	1	-	-	-
Others (O and A levels, MSLC, Form 4, etc)			3	-	2	1	2	-	1	1

Appendix 2b: Specific Areas of Training

Educational levels	No. of respondents	Programmes Of Study				
JHS	8	All are High School Certificate holders				
SHS	14	Business (4)	Science (4)	Gen. Arts (3)	Visual Art (1)	Home Economics (2)
Voc. & Tech.	11	All did General Printing at NVTI				
Cert. & Diploma	3	Diploma in Office Management (1)		Certificate in computer software (2)		
HND	2	All did Graphic Design				
Degree	1	Publishing Studies (Design and Illustration Option)				
Others (O and A Levels, MSLC)	7	Science (2)		Business (1)	Arts (4)	
Total	45					
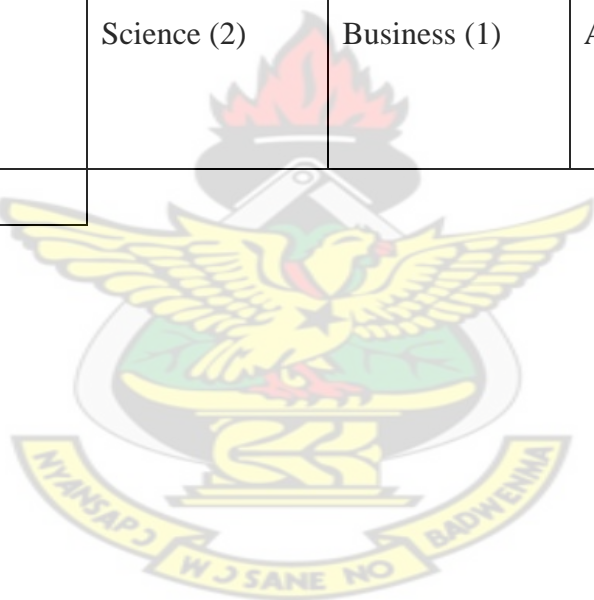
Appendix 3: Basic (Essential) Skills of Respondents

Basic Skills	Total number of respondents	Difficult			Importance			Frequency		
		Diff.	Less Diff.	Aver.	Imp.	Les s Imp.	Aver.	Freq.	Less Freq.	Aver.
Reading text.eg manuals, customers' work	36	7	20	9	32	1	3	18	8	10
Using documents: job docket	23	1	20	2	22	-	1	14	1	8
Writing. Eg job progress	17	-	12	5	14	-	3	3	3	11
Doing calculation of work, paper, plate, time, etc	33	8	21	4	31	-	2	26	3	4
Using calculating devices: calculators, paper and pen, etc	30	1	22	7	27	-	3	20	4	6
Using measuring instruments: units, conversion	28	2	21	5	26	-	2	19	1	8

charts, rulers, etc										
Oral communication with colleagues, mgt, etc	44	3	30	11	42	-	2	39	-	5
Problem solving	44	16	19	9	43	-	1	10	16	18
Decision making	44	6	18	20	41	-	2	13	4	27
Critical thinking	32	10	18	4	27	-	5	16	6	10
Task planning and organizing	33	4	25	4	27	-	6	23	1	9
Remembering things	38	4	27	7	34	1	3	23	5	10
Finding infor. About my work	33	2	16	15	30	-	3	7	9	17
Teaching others about my work and learning new ways about my work	31	9	17	15	29	-	2	8	17	16
Taking part in leadership activities	26	4	10	12	25	-	1	14	2	12
Using computer to work	11	1	8	2	11	-	-	11	-	-

Appendix 4: Core Skills and Attitudes

Core skills	I do this	difficult			Important			Frequent		
		Difficult	Less Difficult	Average	Important	Less Important	Average	Frequent	Less Frequent	Average
Team work	45	6	30	9	40	-	5	25	4	16
Following health	8	1	8	1	7	-	1	5	3	-
Printing process	30	5	13	12	30	-	-	26	-	4
Developing & implementation	29	6	12	11	22	-	7	18	3	8
Controlling & assuring quality	45	6	26	13	43	1	1	18	3	8
Relating to customers	45	4	22	9	43	-	2	21	5	9
Striving for personal dev't	36	14	9	13	35	-	1	17	10	13
Taking personal responsibility	41	7	17	17	38	-	3	17	10	14
Understanding the way personal feel	45	13	16	16	36	-	9	22	8	15
Developing positive relationship	45	4	30	11	39	-	6	32	1	12
Keeping focus	44	8	30	6	41	-	3	39	1	4

Planning how to achieve my work	45	9	18	10	40	1	4	19	2	14
Managing stress	45	20	13	12	39	-	6	12	16	17
Contributing positively	41	10	21	10	39	-	2	26	6	9
Seeking & picking up responsibility	38	10	22	6	36	1	1	18	3	17
Using integrity	44	3	27	14	39	-	5	38	1	5

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Appendix 5: Prepress Operation Skills

Prepress Activities	I do this	difficult			Important			Frequent		
		Difficult	Less Difficult	Average	Important	Important	Average	Frequent	Less Frequent	Average
Revising & Correcting Customers' Work	9	4	2	3	8	-	1	6	2	1
Proofing & Preparing	6	-	4	2	5	-	1	6	-	-
Doing Page layout	11	1	7	3	11	-	-	11	-	-
Scanning Works	11	1	6	4	11	-	-	7	3	1
Understanding Image & Colour	11	2	6	3	11	-	-	9	-	2
Deciding The	11	-	8	3	11	-	-	10	1	-

	I do this	Difficult	Less Difficult	Average	Important	Not Important	Average	Frequent	Less Frequent	Average
Best File Format										
Performing Colour Separation	8	1	6	1	7	-	1	6	-	2
Selecting Fonts &Typefaces	11	2	7	2	11	-	-	11	-	-
Developing Films	5	-	3	2	5	-	-	4	1	-
Developing Plates	-	-	-	-	-	-	-	-	-	-
Adopting New Software	10	-	4	6	8	-	2	8	1	1

Appendix 6: Press Operation Skills

press Activities	I do this	difficult			Important			Frequent		
		Difficult	Less Difficult	Average	Important	Important	Average	Frequent	Less Frequent	Average
Ink preparation	18	6	11	1	17	-	1	13	2	3
Monitoring colour	20	4	13	3	20	-	-	16	2	2
Detecting printing problem	20	7	10	3	21	-	-	15	2	4
Setting registration	19	4	8	7	18	1	-	16	3	-
Understanding the offset	19	2	11	6	19	-	-	15	4	4

	I do this	Difficult			Important			Frequent		
process										
Performing preventive maintenance	20	3	12	5	21	-	-	16	2	3
Washing up the machine	18	2	11	5	18	-	1	16	1	1

Appendix 7: Post-Press Operating Skills

Post press Activities	I do this	Difficult			Important			Frequent		
		Difficult	Less Difficult	Average	Important	Less Important	Average	Frequent	Less Frequent	Average
Collating	34	13	14	7	31	-	3	21	8	5
Sewing	22	5	10	7	18	-	4	5	10	7
Dye-Cutting	5	3	1	1	4	-	1	-	3	2
Perfect Binding	18	2	10	6	16	-	2	3	10	5
Laminating	14	-	11	3	12	-	2	2	9	3
Perforating	18	2	9	7	14	-	4	7	5	6
Stitching	22	4	11	7	20	-	2	12	3	7

Prepress Activities	I do this	difficult			Important			Frequent		
		Difficult	Less Difficult	Average	Important	Important	Average	Frequent	Less Frequent	Average
Revising & Correcting Customers' Work	9	4	2	3	8	-	1	6	2	1
Proofing & Preparing	6	-	4	2	5	-	1	6	-	-
Doing Page layout	11	1	7	3	11	-	-	11	-	-
Scanning Works	11	1	6	4	11	-	-	7	3	1
Understanding Image & Colour	11	2	6	3	11	-	-	9	-	2
Deciding The Best File Format	11	-	8	3	11	-	-	10	1	-
Performing Colour Separation	8	1	6	1	7	-	1	6	-	2
Selecting Fonts &Typefaces	11	2	7	2	11	-	-	11	-	-
Developing Films	5	-	3	2	5	-	-	4	1	-
Developing Plates	-	-	-	-	-	-	-	-	-	-

Adopting New Software	10	-	4	6	8	-	2	8	1	1

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Appendix 8: Questionnaires

Master's Thesis Research

This is a Masters Degree research assessing the gab between existing skills and the standard skills of each specific worker in the print industry. All information provided shall be treated confidential for that purpose only.

1. Personal Data

Gender. …………………………   Job Title: …………………………

2. Educational Data

Educational Level:

………………………………………………………………………………………………

Did you learn this work as an Apprentice? ……………………………..   If yes, for how long? ……………………………..

State any other training you have had in your work? …………………………………………

What did you learn [eg. How to change printing plate, or designing posters]? ……………

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………..

How long did the training take?

………………………………………………………………………………………………

For how long have you been doing this work?

………………………………………………………………………………………………..

What new skills and knowledge have you learnt within the past 2 years? ………………

………………………………………………………………………………………………

………………………………………………………………………………………………..

If you had to choose which of your skills to get additional training to improve, which would they be?

………………………………………………………………………………………………

………………………………………………………………………………………………..

3. Tools and Equipment

Please, state the machines or tools you use to work

……
……
……
……

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Skills, Knowledge and Attitudes Assessment

Job Title:

	Essential Skills		Score/10			
			I do this	Difficulty	Importance	Frequency
1	Reading text: from manuals, brochures, instructions, customers works, etc.					
2	Using documents: job records, job docket, estimation sheets, etc					
3	Writing: job progress records, problems noticed, difficulties with processes, new techniques learnt, etc					
4	Doing calculations of work, paper, plate, time needed, etc					
5	Using calculating devices: with calculators, paper and pen, etc.					
6	Using measuring instruments: Units conversions charts, rulers, densitometers, measuring cylinders, etc.					
7	Oral communication: with other workers, managements, apprentices, etc					
8	Problem solving: e.g. taking personal responsibility to resolve problems to finish by the time the customer want the job, solve unexpected machine problems.					
9	Decision making: e.g. decide whether to attempt difficult equipment adjustments during a run or a technician comes, what speed to run a job, etc.					
10	Critical thinking: eg. evaluate the quality of test copies to determine if press adjustments are needed.					
11	Task planning and organizing a job.					
12	Remembering things: how a customer always want his walk, how I solved a similar design problem, etc.					
13	Finding information about my work and learning new ways to do it.					
14	Teaching others about my work: apprentices, co-workers.					
15	Taking part in leadership activities: supervising others, management discusions, orient new employees.					
16	Using computer to work.					

		Score/10			
	Core Skills	I do this	Difficulty	Importance	Frequency
1	Team-working.				
2	Following health and safety measures always: using hand gloves, goggles, nose masks, etc.				
3	The printing process.				
4	Developing and implementing ways work processes should be done.				
5	Controlling and assuring quality for each work.				
6	Relating to customers: listening to their complains and suggestions, coming into agreement with them.				

	Attitudes		I do this	Difficulty	Importance	Frequency
1	Striving for personal development.					
2	Taking personal responsibility to resolve problems, even those not of my own making.					
3	Understanding the way people really feel.					
4	Developing positive relationships.					
5	Keeping focused and productive, reliable and dependable.					
6	Planning how to achieve my work and personal goals.					
7	Managing stress and conflict.					
8	Contributing positively to team/company morale and spirit.					
9	Seeking and picking up responsibility that I see waiting to be filled.					
10	Using integrity and ethics in my judgement about work and organisational issues.					

Post-press Operating Skills Please, name the Software you use:		I do this	Difficulty	Importance	Frequency
1	Collating and binding printed sheets.				
2	Sewing and gluing of work.				
3	Dye-cutting of products packages, etc.				
4	Perfecting binding procedures.				
5	Laminating.				
6	Perforating, and drilling.				
7	Stitching.				

Appendix 9: Skills Assessment

The skills assessment part has a list of skills which must be scored from a scale of 1 to 10 under the headings, "I do this", "Difficulty", "Importance", and "Frequency".

The Difficulty, Importance, and Frequency (DIF) approach was used to find out:

"**I do this**"—this is to check [x] where applicable to know which of the skills or the knowledge indicated is possessed by the worker.

"**Difficulty**"—assesses the skill or attitude that workers have difficulty with and the degree of the difficulty to them.

"**Importance**"—determines the importance workers see a particular skill or attitude in relation to their work.

"**Frequency**"—assesses the frequency and the degree a particular skill or attitude is used by a worker.