

**IMPROVING LEARNERS PRACTICAL TRAINING AND SKILLS  
ACQUISITION IN PRODUCTION TECHNOLOGY AT THE  
DEPARTMENT OF MECHANICAL AND PRODUCTION  
ENGINEERING - KYAMBOGO UNIVERSITY**

**BOGERE MENY APAUL**

**14/U/12910 /GMVP/PE**

**A DISSERTATION SUBMITTED TO GRADUATE SCHOOL IN PARTIAL  
FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF  
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## APPROVAL

This dissertation entitled “Improving student practical training and skills acquisition in production technology” at the Department of Mechanical and Production Engineering Kyambogo University”, has been done under our supervision. It has been submitted to the Graduate School for examination with our approval as the student’s supervisors.

Signature .....  .....

Name: Dr. Muhwezi Lawrence

Date ..... 07/12/2016 .....

Signature .....  .....

Name: Dr. Baguwemu Ali

Date ..... 07/12/16 .....

## **DEDICATION**

I dedicate this dissertation to my beloved family. May the good Lord bless you abundantly!

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## LIST OF ABBREVIATIONS

|       |                                                     |
|-------|-----------------------------------------------------|
| DIT   | Directorate of Industrial Training                  |
| DMPE  | Department of Mechanical and Production Engineering |
| ELA   | Experiential Learning Approach                      |
| HDM   | Higher Diploma in Mechanical                        |
| HoD   | Head of Department                                  |
| ITEK  | Institute of Teacher Education Kyambogo             |
| KYU   | Kyambogo University                                 |
| LCA   | Learner Centred Approach                            |
| MVP   | Master of Vocational Pedagogy                       |
| TVET  | Technical Vocational Education and Training         |
| UNISE | Uganda National Institute of Special Education      |
| UPK   | Uganda Polytechnic Kyambogo                         |
| VET   | Vocation Education and Training                     |
| VIP   | Visual in Participation                             |
| WOW   | World of Work                                       |
| KLSI  | Kolb's Learning Styles Inventory                    |
| ELT   | Experiential Learning Theory                        |
| PAR   | Participatory Action Research                       |

## ABSTRACT

The main purpose of this study was to improve student practical training and skills acquisition in production technology in the department of mechanical and production engineering at Kyambogo University. The objectives of the study were to; establish the practical training methods that are used to teach production technology at the DMPE in Kyambogo University; identify the gaps in practical training methods on the level of skills acquisition of the learners at DMPE in Kyambogo University; provide suggestions for improving the practical training methods at DMPE so as to enhance skills acquisition of the learners at DMPE in Kyambogo University. The study was qualitative and used action research design. The study involved eleven students of Higher Diploma in Mechanical II class, four lecturers, four technicians and one head of department. Using Future Workshop, data was collected on practical training gaps hindering the enhancement of skills acquisition in production technology. The results from future workshop revealed existence of the following gaps: loss of interest by both learners and lecturers, lectures delivery methods needed improvement, inadequate coverage of content, little emphasis on practical training, inadequate training materials, irregular payments to lecturers, high number of part time lecturers, different training equipment in university compared to those in industry among others. Several interventions were proposed to address the identified gaps. The proposed interventions were that training should be participatory where by both lecturers and students are active participants, practical related lessons should be taught in laboratories and workshops to link theory to reality, Head of department of mechanical and production engineering should procure some training materials for student to practice, mode of delivery should be strengthened by use of modern teaching instruments like projectors and video clips. The study recommends that for effective practical training to take place, appropriate tools and equipment should be provided, learning should be participatory and mode of delivery should be improved through the use of modern instruction materials and learning aides. From the Research findings the researcher together with the participants concluded that learners practical training can be improved by encouraging Hands-on Demonstration, and Group work teaching methods.

## **CHAPTER ONE: INTRODUCTION**

### **1.0 Overview**

This chapter presents the introduction/, background, problem statement, purpose and objectives of the study, study scope significance, and definition of key terms in the study.

### **1.1 Background**

This study deals with the skills and knowledge required to effectively undertake interactive practical work at the training place and applies to all individuals participating in practical learning or working in the foundry, metal workshop and any type of engineering industry. Workshops are important components of manufacturing technology and hence they require appropriate skills and knowledge in handling several materials used in the manufacturing process.

Manufacturing technology, in its comprehensive sense, is the process of converting raw materials into products. Manufacturing also involves activities in which the manufactured product itself, is used to make other products. Examples could include large presses to shape sheet metal for appliances and car bodies, machinery to make fasteners, such as bolts and nuts, and sewing machines to make clothing. A nation's level of manufacturing activity is related directly to its economic health. Generally, the higher the level of manufacturing activity in a country the higher the standard of living of its people (Rosa and Feisel, 2005). Manufacturing and production technologies include workshop and laboratory experience found in machining, welding and casting.

Production Technology is a practical course. According to Rosa and Feisel (2005), applying skills to everyday life requires both theory and hands on work experience. While theory is classroom learning hands on is practiced in the workshop. Production technology is the foundation of engineering materials and joining processes. For anyone to train as an effective technician, one needs to observe and understand the skills required to work in a workshop and with different equipment. In situations

where appropriate skills are not imparted in learners, various accidents happen in the process of handling and operating equipment.

Kyambogo University has been in existence for over a decade and many young people have and are still being trained as technicians and engineers in different fields of specialisation. In the Department of Mechanical and Production Engineering (DMPE), training includes the following course units: Welding and Fabrication, Machine shop practice and Foundry Technology. Graduates of this department to a large extent do not have the required competencies to demonstrate what they learnt when they were learners at the department. According to the situation analysis carried in the Department of Mechanical and Production Engineering, it was observed that if skills training in the DMPE is not improved, graduates will be less competitive on the current job market at both national and international levels and may not be able to create their own jobs in their trades. The situational analysis report indicated that if learners acquire relevant experiences in handling equipment, they will be able to enter industry with problem solving skills in planning, design production, material handling, quality control, inspection and programming with computer-aided controls. The student, upon the successful completion of program, will have a job-entry skill. To further understand the need for appropriate skills and training acquisition, the researcher sampled foundry competences from world of work using a job process analysis from two selected companies about the required graduate employability skills. The researcher looked at the job work process analysis of a Foundry technician from two companies namely; John Lugendo and company foundry workshop in Ndeeba and Nakawa vocational training institute in Nakawa, and gathered information about the competences required of a foundry technician in world of work. The findings from the two workshops revealed that whereas it is important to appropriate skills as a technician, DMPE workshop at Kyambogo was lacking most of the essential requirements for the proper acquisition of skills and practical knowledge for an effective technician.

## **1.2 Personal and Professional Background of Researcher**

The researcher is a holder of Bachelor of Education in Technological studies (Mechanical option); He also holds a Post Graduate Diploma in Vocational Pedagogy. His other qualifications include:-Diploma in Education Secondary (DES) and

Mechanical Engineering Crafts Part II (MECP II) and blacksmith welding. His present job title is a Senior Technician in DMPE and he is currently pursuing a Master's Degree in Vocational Pedagogy (MVP) at Kyambogo University.

He is a senior technician in the Department of Mechanical and Production Engineering where he has served for over 27 years. The researcher performs his tasks at work diligently with the purpose of acquiring up to date competences and improving the training of learners. The learners he teaches include; first and second year undergraduates and higher diploma learners offering course units in welding and fabrication skills, metal forming techniques, sheet metal technology and foundry technology. He also supervises group projects. During the same period he had an opportunity to work with skilling Uganda Training of Trainers. During the course of execution of his duties, he noticed that learning depends a lot on how the teacher executes his/her teaching/demonstration processes. When he tested the vocational didactical approach of teaching/learning, he found out that it gave the learners more chances to learn than the traditional methods of teaching.

### **1.3 Work Process Analysis**

Through interaction with foundry technicians in labour market, the researcher noted that the foundry technician should be hospitable to clients, carry out job planning and costing, prepare moulding sand by washing it clean and drying it, grade sand by sieving to get fine sand for facing and coarse for barking, mix the moulding sand by adding water to make it soft for bonding, develop allowance on the pattern to be used for machining purposes, carry out moulding process, have knowledge in mould baking process to reduce moisture content, sort scrap material to be melted according to the type of material, melt scrap by heating it in a furnace and cast the molten metal in prepared moulds, break the casted mould, clean the casting (product after solidification), finish the product by grinding or machining, improve on the metal property by carrying out heat treatment and repair the furnace by removing slag (solidified impurities).

### **1.3. 1 Application of Future Workshop to Identify Challenges in the DMPE**

Future workshop is a method that enables a group of people to develop new ideas or solutions when working together for instance with social problems. A future workshop is a method which is participatory and democratic process to reach decisions for problem solving.

### **1.3.2 Outcomes of Future Workshop**

The critical areas of concern in the Department of mechanical and production engineering Kyambogo University. How the problem was identified and objectives generated from the situational analysis in Competencies of a Foundry Technician.



**Figure 1.1: Stakeholders' Consultative Meeting**

**Source: Field data (2016)**

At the Future workshop meeting as seen in figure 1.1, members identified the following as being the causes of inadequate skills acquisition: loss of interest by both learners and lecturers, lecture method of delivery need improvement, inadequate coverage of content, poor emphasis of practical training, inadequate training materials, lack of technicians interacting with learners leaving them to do lectures theory, part time lecturers don't get regular payments, most lecturers are part timers, different training equipment in university compared to those in industry, change from theory to practical, research on changing technologies and environment, wild animals, blocked sewages and over grown trees, little time for practical, linkages between theory and practical, lecturer s participation in practical is poor and lack of chairs, toilets and class rooms.

### **1.3.3 Visualized Challenges**

Participants fantasised and reached the realisation phase from the above challenges and came up with the following tasks to be handled in the DMPE. These included: setting standard assessment for practical exercises, using relevant methods of content delivery, preparing applicable practical exercises, performing continuous research and going for refresher courses and integrate theory with practical.

### **1.3.4 Action Plan**

The researcher together with the participants were assigned to carry out the following;

- i) Set standard assessment for practical exercises.
- ii) Use relevant methods of content delivery.
- iii) Prepare applicable practical exercises.
- iv) Perform continuous research and go for refresher courses.
- v) Integrate theory with practical.
- vi) Conduct practical exercises as a team and learners were required to attend practical training.

The HOD was to procure training materials. The researcher was to supervise the process to ensure change in practical training is achieved in the DMPE.

## **1.4 Motivation for the Study**

Having acquired a post graduate diploma in vocational pedagogy and having applied its methodology of approach to teach, the researcher noted a lot of improvement in learners' work due to their high interest and motivation as a result of their participation in learning process. Masters' programme introduced him to vocational training pedagogy and vocational didactics (training by participation at place of work or workshops). According to Brunette (2006), technology subjects must include practical attachment. The researcher as a technician concurs with him because translating theory to practice provides the practical experience necessary in the world of work; it is more motivating and interesting hence learning outcome is improved. When the researcher completed his post graduate diploma, there was a missing gap of

research on practical teaching methods which made his work expectation and execution incomplete as a vocationalist warranting him to go for research in Vocational Education and Training (VET) where holistic learning is emphasised. His area of interest was to improve practical training in Production Technology through work process analysis. He looked at a foundry technician's world of work job analysis's case study which is among the courses he teaches under production technology.

### **1.5 Problem Statement**

Appropriate practical training and skills acquisition are paramount for any successful technician, it should enable the technician to be competitive in the world of work and build a technician's confidence to handle tasks. Technicians trained at the Department of Mechanical and Production Engineering of Kyambogo University lack most of the qualities of an effective technician. The technicians trained at Kyambogo University in the Department of Mechanical and Production Engineering quite often find a problem to be integrated in the world of work. This results into many future students to turn change their mind from training as technicians. The study therefore analysed the causes of the scenario so as to offer appropriate interventions to address the situation.

### **1.6 Purpose of the Study**

The purpose of the study was to identify interventions to improve learners' practical training and skills acquisition in production technology in the department of mechanical and production engineering at Kyambogo University.

### **1.7 Specific Objectives of the Study**

The specific objectives were:

- i. To establish the practical training methods that are used to teach production technology at the DMPE in Kyambogo University;
- ii. To identify the gaps in practical training and skills acquisition methods at DMPE in Kyambogo University;

- iii. To suggest interventions of improving the practical training and skills acquisition methods at DMPE in Kyambogo University.

### **1.8 Research Questions**

- i) What are the practical methods being used in the teaching of production technology at the DMPE Kyambogo University?
- ii) What are the gaps in the training methods in production technology at the DMPE Kyambogo University?
- iii) What should be done to improve practical training methods so as to enhance skills acquisition in DMPE Kyambogo University?

### **1.9 Justification of Study**

Preliminary investigations conducted in the world of work by the researcher indicated that graduates don't meet job market demands and are unable to create their own employment which causes an effect on the national development. Therefore, long life skills should be emphasized and the findings of this study will address this gap.

### **1.10 Significance of the study**

The findings of this study will enhance student practical training and skills acquisition to the extent that graduates in DMPE will be employable and create their own employment thereby being self-sustaining and also contribute to the national development of the country.

The outcomes of this study will be used in other course units in the DMPE and later the faculty of Engineering. It is expected that the recommendations arising from this study will also be used to solve medium and long term challenges in the department

The finding of this study will help to improve on the practical training methods thus achieving the national vision of skilling Uganda and it will also be made available to National Board for Technical Education who is the coordinating ministry for tertiary institutions.

## **1. 11 Scope of the Study**

The scope embraced three aspects that is to say geographical scope, content scope and time frame.

### **1.11.1 Geographical Scope**

The research was carried out at Kyambogo University in Nakawa Division 8km from Kampala District. Kyambogo University is off road 2km from the Kampala-Jinja highway. It is accessible through Banda trading centre and Kyambogo “T” junction. There is also an access route through Ntinda–Kiwatule Road.

### **1.11.2 Content Scope**

The study targeted learners who are offering production technology at the Department of Mechanical and Production Engineering in Kyambogo University. It investigated employable requirements that learners should have in order to meet the market demands. This study also looked into the appropriate strategies required to ensure that practical acquisition is achieved. The researcher aimed at establishing appropriate student practical training models that enhance skills acquisition in production technology for learners and also establish appropriate strategies for adopting the models as a training method for both lecturers and technicians in order to improve practical training in the DMPE according to Future workshop findings at Kyambogo University.

### **1.11.3 Time frame**

This research was done in eight months; started in November 2015 and ended in June 2016

## **1.12 Definition of Terms**

**Practical training:** Practical training means studying which takes place in a company or business, offering the student the opportunity to adapt what she or he has learned in practice and develop professionally.

**Skill acquisition** is the ability to be trained on a particular task or function and become expert in it. It is a pity that there is “huge” parading of unemployment in many parts of the world today especially in Uganda.

**Production Technology:** Production technology is a system for scheduling the manufacture of products and managing stock inventory that aims to optimize costs, minimize inventory and maintain a steady work flow.

**Foundry Technology:** Foundry Technology is a process that brings together basic metal casting phenomena, production technology techniques and product characteristics in a single work reference.

**Casting:** Casting may be defined as a “metal object obtained by allowing molten metal to solidify in a mould,” the shape of the object being determined by the shape the mould cavity.

**Welding Technology:** Welding Technology is a process of permanent joining two materials (usually metals) through localized coalescence resulting from a suitable combination of temperature, pressure and metallurgical conditions.

**Machine Shop Practice:** This is a process through which a student is well equipped with safe working environment in which he/she can design and manufacture his/her project for engineering activities, research and manage machine operations to produce desired products.

**Vocational:** Relating to the special skills, training, that you need for a particular job or occupation

**Pedagogy:** The art or science of teaching; education; instructional methods.

**Competencies:** The ability to do something well to accepted quality.

**Experiential Learning Theory:** This is the process of learning through experience, and is more specifically defined as "learning through reflection on doing"

**Experiential Learning Theory:** This is the process of learning through experience, and is more specifically defined as "learning through reflection on doing"

**Skills:** Skill is the level of competency to carry out a task with pre-determined results often within a given amount of time, energy or both

**Participatory Action Research (PAR)** is an approach to research in communities that emphasizes participation and action. It seeks to understand the world by trying to change it, collaboratively and following reflection as seen in figure 1.2 below. This action research approach was adopted because action researchers are co-producers of knowledge with social actors based on free agreement to participate (Nielsen and Suesson, 2006). Since the research aimed at improving practical training in production it was necessary to involve the stake holders to identify strategies for implementation.



**Figure 1.2: Participatory Action Research (PAR)**

**Source: Adopted from Robert (1970)**

**Future Workshop** is a futures technique developed by Robert (1970). It enables a group of people to develop new ideas or solutions of social problems. A future workshop is particularly suitable for participants who have little experience with processes of creative decision making.

The **World of Work** describes paid work and the pursuit of a career in all its social aspects, to distinguish it from home life and academic study.

**Action research** is variously termed as a dynamic educative process or a social investigation process, aiming to address a problem or to engage in socio-political action (Selener, 1997).

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Overview**

This chapter discusses works of other scholars on the subject matters to be used in future work within the research as prescribed conditions or ideas for successive chapters.

### **2.1 Introduction**

Teaching and training is only effective if it promotes learning (Killen, 2007). As instructors we are expected not only be skilled in our areas of speciality but also to have knowledge about how learning takes place in learners. It is the only way to shift away from traditional teaching that provides subject knowledge to student centered learning (Killen, 2007). In this study the researcher reviewed studies of other scholars so as to provide the rationale for this research topic. The researcher aimed at giving an overview of the current student practical training in production technology in the DMPE. It was to identify gaps in training that research should address and this was important because it showed why this action research topic was important. Through literature review relevant methodologies were identified which guided the researcher in conducting this study. This literature review was based on three specific objectives as follows:

- i) To establish practical training methods being used in teaching production technology at the DMPE.
- ii) To identify gaps in those training methods.
- iii) To propose suggestions to improve practical training methods used in teaching production technology at the DMPE.

### **2.2 Theoretical Background**

The theories of learning that I have been exposed to in this Master's Degree programme have made me understand that learners learn better when they are actively involved in their own learning for they know better what and why they should learn. Teaching is not about helping learners to accumulate knowledge that is passed onto

them by the teacher but rather about helping them to make sense of the new information (Felder and Brent 2003).

I have learnt that as a teacher, my role is to guide, counsel and mentor learners so that they can learn but not to act as a pool of knowledge which is inspired by the constructivist theory of learning. The researcher appreciated the idea that learners can construct their own knowledge from their own experiences and thus should be given a chance to do it in order to derive meaning from whatever experience they undergo. As noted by Mjelde (1993, p. 19), learning should not be seen as anything that happens inside a student's head when he/she listens to a teacher or reads a book but should be known to be fundamentally interactive process where both the learner and the teacher are playing active roles but with more emphasis put on the learner since it is whom the learning is intended. Felder and Brent (2003) point out that the only way a skill is developed is through critical thinking and, writing, technical skill is through practice. It involves trying out something, seeing how well or poorly it works, reflecting on how to do it differently, and then try it again to see whether it works better.

The theoretical framework for the study is based on Kolb's Learning Styles such as Inventory (KLSI) model and Experiential Learning Theory (ELT) as defined by Armstrong (2008) in relation to Kolb's experiential learning theory. It states that learning involves the acquisition of abstract concepts that can be applied flexibly in a range of situations providing a holistic model of the learning process and a multi-linear model of adult development, both of which are consistent with what we know about how people learn, grow, and develop. This study views Kolb's model as relevant since it aims at capturing the nature of learning through action. Hence, the theoretical framework chosen for this study is relevant because the study is based on the integration of theory to practical knowledge in the production technology course. Kolb's learning theory sets out four distinct learning styles, which are based on a four-stage learning cycle (that might also be interpreted as a 'training cycle'). The four-stage learning cycle consists of; Concrete Experience (CE); Reflective Observation (RO); Abstract. Conceptualization (AC), and Active Experimentation (AE). Concrete Experience occurs when learners experience active participation in the Production Technology practical workshop, i.e. learners first see the project they are supposed to do in the workshop. Reflective Observation is the stage when learners produce their own explanations from the drawing.

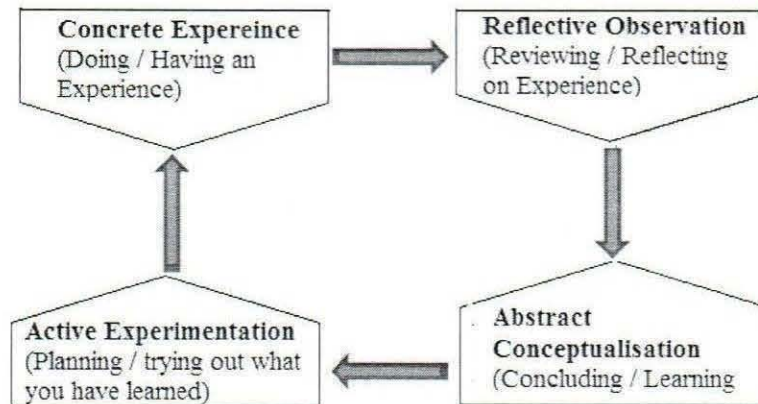


**Figure 2.1: Kolb's Experiential Cycle**

**Source: Adopted from Kolb's experiential learning curve (Kolb, 1984)**

Action Conceptualisation is when learners conceptualize the principle relating to how the final product would look like from the drawing. Active Experimentation is a doing or performance stage, where learners are expected to manipulate equipment, materials and tools while taking safety issues into consideration (Figure 2. 1). In relation to this study, Kolb's four learning styles involve the process which leads learners to understand, design and make the final practical model in the workshop. To be able to do this, learners are expected to conceptualize and put the project to be made in drawing form or, most importantly, to be able to interpret the project drawn on paper. In this study the researcher views learning as an integrated process with each stage being mutually supportive of and feeding into the next. It is possible to enter the cycle at any stage and follow it through its logical sequence. However effective learning only occurs when a learner is able to execute all four stages of the model. Therefore no one stage of the cycle is effective as a learning procedure on its own (Figure 2. 2).

Like a chapter in a good textbook, a lecture is an efficient way to deliver course content. However, delivering course content is not always the same thing as fostering actual learning. According to Eric Mazur (1997), studies have shown that during a typical lecture, learners usually capture only a small portion of the content that an instructor conveys verbally, and they remember even less of it.

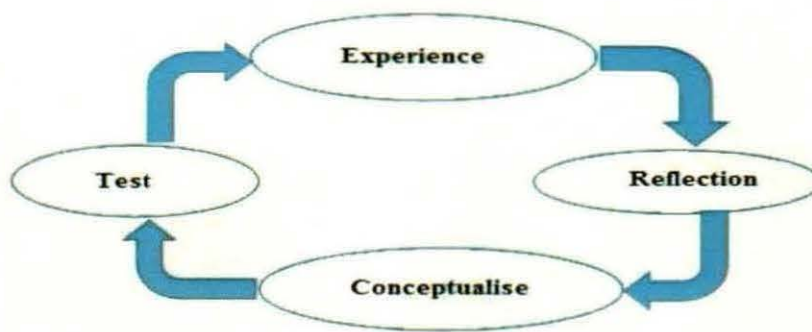


**Figure 2.2: Model for Testing Hypothesis in Future Situations.**

**Source: Adopted from Kolb's experiential learning curve (1984)**

Yet despite these limitations, lectures continue to be a dominant pedagogical mode in many universities, probably for three reasons:-Firstly, instructors tend to teach the way that they themselves were taught. If the courses you took as an undergraduate were lecture-based, then that's probably how you began teaching your undergraduates. We tend to re-enact what is familiar. Moreover, lectures have a venerable history. For centuries prior to about 1850 when textbooks came to be mass produced lectures were the only feasible way for scholars to share content with learners.

Secondly, it's easy for an instructor especially one who is teaching a course that is prerequisite to another course to become focused on covering "content" rather than on ensuring that learners are actually learning. Thirdly, many instructors point out that large class sizes make it difficult to do anything other than lecture during class. The researcher views these points as genuine challenges in higher institutions of learning where student teacher ratio is not considered though there are also some ways to mitigate it like forming smaller groups.

Teaching methods affect retention and if you cannot remember what you learned, the time you spent learning is wasted (Eric, 1996). He goes further to indicate the learning pyramid as shown in figure 2.3

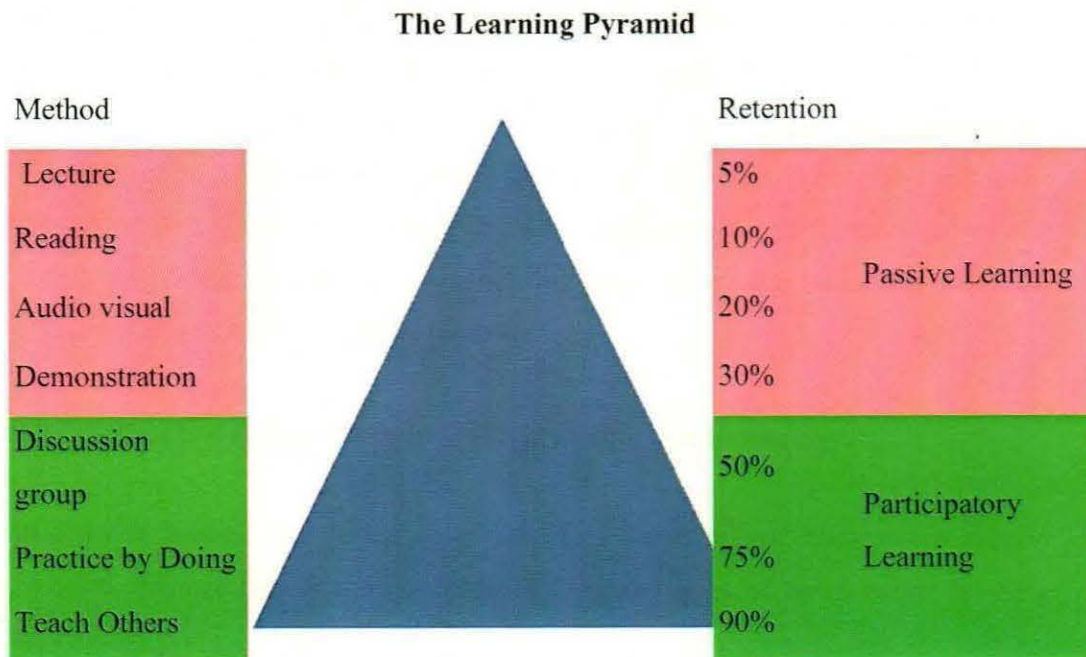


**Figure 2.3: The learning pyramid**

**Source: Adopted from Eric (1996)**

In figure 2.3, the first four (lecture, reading, audio visual and demonstration) are passive learning methods. In contrast, the bottom three (discussion group, practice by doing and teach others) are participatory (active) learning methods. Arguably, the difference in retention between passive and participatory (active) methods is due to the extent of reflection and deep cognitive processing. Learning in small groups increases chances to participate in working together and increase retention in learners.

In 1997, Mazur published a book on the subject called *Peer Instruction: A User's Manual*. Others later supported the seemingly commonsensical idea that student engagement worked, such as Richard Hake in his 1998 report entitled *Interactive-engagement versus traditional methods: Research which concluded that*: "the conceptual and problem-solving test results strongly suggest that the classroom use of Interactive-Engagement methods can increase mechanics-course effectiveness well beyond that obtained in traditional practice." To many people, the approach Mazur advocates may hardly seem new or controversial. After all, many instructors work hard today to make their classes more interactive. However, the main challenge is trainers not to unlearn from the traditional habits they were brought up and adapt new changes to match new situations for quality education in learners today. "Mazur

thought he was a good teacher” not until he discovered his learners were just memorizing information rather than learning to understand the material,” said Mazur. “Who was to blame? The student or the material”. In his presentation entitled “Confessions of a Converted Lecturer,” (Mazur, 2009) explained how he came to the conclusion that “It was his teaching that caused learners to fail. The researcher also conquers with him because many times during our job execution we improvise a lot to bridge the in adequacy of training materials.

### **2.3 Practical training methods in teaching production technology**

In order to address this objective of the study some related literature to support practical training methods were considered by the help of these major teaching approaches;

- a) Experiential Learning Approach (ELA) and
- b) Learner Centred Approach (LCA).

#### **2.3.1 Experiential learning approach**

Learners learn best through interaction with the environment, Peer groups or from experts according to (Vygotsky, 1962). This study will try to build learning from the known knowledge so that learners are given chance to participate actively. Experiential learning is man’s natural learning environment that challenges our limits while producing a feeling of achievement (Bob, 2005). It is based on discovery and experience and this inspires learners to learn more about the world they live in because discovery is a highly motivating force. Experiential learning does not consider learners as gifted or as learning disability due to the fact that each person experience things differently. Experiential learning reflects the perspective of learning as a person’s knowledge development rather than knowledge acquisition and therefore focuses a learner as an active subject and learning as a process (Bjerknes, 2002). The basic values underpinning experiential learning are that both the teacher and the learner are subjects in the learning situation and their relationship is characterized by equality and dialogue. Their roles are both symmetrical and asymmetrical as noted by Bjerknes. Although we can simulate the real world in the classroom and laboratory, authentic experiential learning creates an invaluable opportunity to prepare learners

for a profession or career, learn the craft of a fine artist, or discover how the discipline creates evidence to contribute to its body of knowledge. Thus, Sullivan and Rosin (2008) argue that the mission for higher education should be to bridge the gap between theory and practice and Bass (2012) suggests that to do this, the educational environment needs to intentionally create rich connections between the formal and experiential learning. Particularly at a research university, we have a responsibility to create situations where learners benefit from the abundance of research that is taking place. Experiential learning provides one approach to ameliorating this criticism and mining the richness of the research taking place at the university.

Experiential learning motivates learners and provides the conditions for optimally supporting student learning. When learners are engaged in learning experiences that they see relevance in, they have increased motivation to learn. Learners are also motivated when they are provided opportunities for practice and feedback. Experiential learning meets these criteria (Ambrose, 2010). Through experiential learning, learners are confronted with unfamiliar situations and tasks in a real-world context which creates self-directed learning. To complete these tasks; learners need to figure out what they know, what they do not know and how to learn it.

This requires learners to reflect on their prior knowledge and deepen it through reflection; transfer their previous learning to new contexts; master new concepts, principles, and skills; and be able to articulate how they developed this mastery (Linn, 2004). Ultimately, these skills create learners who become self-directed, life-long learners.

Through expeditions the following were noted; the instructor gave instructions and the learners are considered taught. This is based on the premise that the instructor knew everything and the learners know nothing. In effect the instructor did the thinking and the learners were thought about. Similarly, in Kyambogo University, in the mechanical Department, the lecturers and technicians talk and the learners listen meekly. The lecturers and technicians discipline and the learners are disciplined. The lecturers and technicians choose and enforce their choices and the learners comply. The lecturers and technicians act and the learners have the illusion of acting through their actions. The lecturers and technicians choose the programme content, and the learners who were not consulted adapt to it. The lecturers and technicians confuse the authority of knowledge with their own professional authority, which they set in

opposition to the freedom of the learners. The lecturers and technicians are the subject of the learning processes, while the learners are mere objects. Today, the student-centered learning models are advocated for in Vocational Education and Training (VET). This is because the model is ideal and supports a range of didactics in the different course units in an academic program. Also, the learner centered models enable the learners document their learning by compiling and presenting their work throughout their academic careers in the form of portfolios.

### **2.3.2 Learners Centred Approach**

Learner centred instruction is when the planning, teaching and assessment revolve around the needs and abilities of the learner (Brown, 2008). This model is ideal for acquisition of long life practical skills and abilities.

Learner-centred approaches to teaching have emerged from changes in understanding of learning and knowledge creation and more particularly their origin is deeply rooted in the body of learning theory known as constructivism (both cognitive and social constructivism). In broadest terms, constructivist learning is based on the understanding that learners construct knowledge for themselves. The cognitive constructivism is based on Piaget's model which emphasizes the interaction of an individual with his environment in the construction of meaningful knowledge. The social constructivism is based on the works of Vigotsky (1962), who emphasizes the importance of learners learning through interactions with the teacher and other learners. The principal implication of constructivist understanding of how knowledge is created is that learners are the key initiators and architects of their own learning and knowledge creation rather than being passive vessels who receive the transmission of knowledge from expert teachers (Barraket, 2005). Therefore learner-centred teaching strategies emphasize that knowledge is constructed and that teaching should focus on the learners' understanding rather than memorization of information in form of facts (Killen, 2007).

Gibbs (1995) defines learner-centred learning as a process by which learners are given greater autonomy and control over the choice of the subject matter, the pace of learning and the methods used whereas Nanny cited in (Barraket, 2005) defines it as a broad approach that ultimately holds the student responsible for their own educational

advances. From these two definitions it can be seen that the focus of teaching in learner centred approaches is on the learner, the relationship between the student and the teacher and the learning process rather than the teacher and the content.

The researcher also draw some understanding of learner centred approaches to teaching on Weimer's thinking who is concerned with learner-centred teaching as an exercise in changing teaching practice(Weimer, 2002). Weimer identifies learner-centred teaching as comprising five changes in teaching practice which are:

- Balance of class power between the teacher and the student
- Designing content as a means to building knowledge rather than a knowledge end itself
- Positioning a teacher as a facilitator and contributor other than a director and source of knowledge
- Shifting responsibility for learning from teacher to learners and
- Promoting learning through effective assessment.

As seen from Weimer's five changes, making a shift towards learner centered learning and teaching requires changes in the learning environment, changes in the nature and communication of the learning content and changes in the assessment of learning outcomes. This puts a teacher on a task or in a position of a researcher to find out the best possible ways of bringing about the necessary changes for effective implementation of learner centered approaches.

Hativa (2000) identifies that learner centered instructional methods include among others discussion, group work/learning, experiential learning, role playing; Work Based Learning and case-method teaching. This implies that there are a variety of options or methods that are learner centered from which a teacher can choose whenever it is deemed necessary to employ them in her/his teaching. Roy Killen also observes that learner centered approaches (sometimes called "discovery learning, inductive learning or inquiry learning) place a stronger emphasis on learners' role in the learning process. However, this does not mean that all the learning responsibility and power is rendered to the learner. The teacher still has a professional responsibility of guiding the learners in their learning process and has to set the learning agenda but of course with much less direct control on what and how learners learn (Killen, 2007).

It only means that the teacher is no longer a filter through which all the information to the learner must pass- some of the things that learners will learn will come from their individual and group investigations.

**i) Discovery Learning**

Discovery Learning Approach is where the instructor provides instructional materials for a student to try on his own according to Ajewole (1990) I intend to list all necessary procedures to achieve results of the given task on paper and allow learners to work on their own.

**ii) Work Based Learning**

Work Based Learning, at construction sites according to Sannerude (2002) the more the learner participates directly with the real materials the faster the learner acquires the skill.

Learner-centred approaches and teacher-centred approaches differ in many ways which include; what the teachers does, the way the lessons are organized, how much the learners are engaged actively in the learning activities and how much learners control their learning process, however, in either approach the teacher has a central role as both the planner and a facilitator of learning.

The teacher has to establish the outcomes the learners are to achieve in the learning process and help learners to learn. The real difference is on how the teacher structures and mediates the learning (Killen, 2006). This kind of learning is supported by Thomas and Noel (2003) where they argue that the reason why teachers teach is to enable learners to learn. Thus, teachers should by all means possible try to facilitate, guide, counsel and to mentor their learners so that they can learn and understand what they learn through methods that will encourage their active learning to take place.

Student engagement through learner centred approaches leads to desirable learning outcomes in a sense that it increases motivation for learning and greater satisfaction with school (Blumberg, 2009). Blumberg (2009) asserts that learners in learner centred programmes differ from those in teacher centred programmes.

## **2.4 Practical Training Methods Currently Used at the DMPE**

Practical training methods currently used at the DMPE and mode of delivery at Kyambogo University is mainly teacher centred and is not participatory and work

targeted. The public is clamouring for an education that teaches learners the competencies they need for real-world success. The current practical training methods being used at the Department are well explained in details 2. 5. 1 to 2. 5.4.

#### **2.4.1 Demonstration Method**

The demonstration method is a technique of teaching usually associated with demonstrating a practical skill. It often introduces the skill and; its point of application and importance. The skill is demonstrated after which the learners practice that skill.

The demonstration method of teaching is used in the practical situations:

- To introduce a new skill to a group of learners:-
- To rectify faults with individual learners:-

E.g. Filing a square material; grooving to fit; cutting squarely.

Guidelines on how to carry out a Demonstration:

When preparing a demonstration lesson one must bear in mind the following:

- i) Identify key points.
- ii) Relate theoretical underpinning to key points.
- iii) Rehearse to ensure all equipment is working and that you can use it.
- iv) Ensure that all learners can see even small equipment and process.
- v) Time your demonstration. If it is more than say 10 minutes, consider subdividing into a series of demonstrations.
- vi) Consider how to emphasize safe working practices.

One must bear in mind the following when he/she is going to present a lesson involving demonstration;

- i) There must be a clear introduction of what is to be demonstrated,
- ii) The presenter must be familiar with the names of tools/equipment,
- iii) One must check the entry / gathering behaviour of learners for the demonstration.
- iv) The presenter should not show how not to complete the skill.
- v) The presenter should stress key points and show links between them
- vi) The presenter must stress safety aspects.
- vii) The presenter must check learner understanding.

The advantages of demonstration Method of teaching are;

- i. When carried out well the demonstration method of teaching can be highly motivating to learners – better than verbal description.
- ii. Theory and practice can be linked in the demonstration teaching approach.
- iii. The pace of conducting a demonstration can be varied.
- iv. Learners usually enjoy actively doing things the demonstration approach of teaching offers them this.
- v. Expert demonstrations may be available via the video and teacher's activity becomes to clarify at some points.
- vi. Key points can be stressed and repeated.
- vii. Demonstration method is three dimensional i.e. the person sees what is taking place as it is supposed to be. On top of that he can use the sense of smell and even hear what is taking place.
- viii. Learners see the sequence of conducting the demonstration and build it to the level of them internalizing it.
- ix. Demonstration method may allow learners to ask questions.

The demonstration method of teaching may have the following disadvantages:

- i. A poor demonstration can be frustrating for the learners.
- ii. The method can be too fast or too slow for the learners.
- iii. The method leaves no permanent record.
- iv. The demonstration may be too difficult to see.
- v. May be too long leading to loss of concentration.
- vi. Learners may learn bad habits / techniques.
- vii. Can be very expensive in terms of material costs.
- viii. The teacher needs to rehearse to be sure of what he is to do.

#### **2.4.2 Brainstorming Method of Teaching**

Brainstorming as a method of teaching means; a problem solving technique used to generate a number of ideas (solutions) in a short time e.g. 5 to 15 minutes.

The brain storming method of teaching is normally used when a problem, real or manufactured, exists and learners are invited to generate possible solutions.

This method of teaching is often used in management courses or with problem solving where the learner is asked some questions and is allowed to think.

The guidelines that must be followed if a teacher is to use a brainstorming method of teaching are:

- i. The 'problem' should be stated as "In how many ways can we ...." Restatements can be suggested by learners to ensure that they understand the problem.
- ii. The learners are encouraged to shout out key words.
- iii. All the shouted words are written down without criticism or censure.
- iv. If the participants dry up, there can be an enforced two minutes silence. Then the brainstorm continues.
- v. The key words are then categorized and discussed.
- vi. Possible solutions are then identified.

The gains of using the Brainstorming method in teaching are:

- i. Unusual solutions may be identified.
- ii. All can participate
- iii. Needs few resources
- iv. Seems to be part of the creative process.
- v. Uses learners experiences
- vi. Encourages teamwork.
- vii. No – one looks foolish.

The disadvantages if one chooses to use the brainstorming method of teaching are:

- i. Group needs to learn and obey rules.
- ii. Warm-up sessions may be needed
- iii. Can be demanding and can only be used for short periods.
- iv. Some learners can opt out

How can one summarize the Brainstorming method of learning? - It is a challenging and active learning situation.

### **2.4.3 Explanation**

The most common form of teaching in engineering classes in Kyambogo University is undoubtedly lecturing, and for many lecturers lecturing is synonymous with teaching.

Lecturing can be an effective, efficient, and satisfying method for both lecturers and learners. Yet many lectures do not satisfy learning principles and are not conducive to student learning.

One of the fundamental principles of engineering is to attack the critical problem which can make the most difference. In engineering education, improving lecturing is arguably the critical problem; and the first focus on improving engineering education at all schools should be on improving lecturing.

Lecturing is a two-sided coin. An aspect of lecturing which is advantageous for an excellent lecturer can be a disadvantage for a poor lecturer. However, practically every disadvantage can be overcome if the lecturers make an effort to overcome the problems. The following advantages and disadvantages are gleaned from experiences from Alexander and Davis(1977).To them lecture method is good for teaching large classes however it does not make learners creative since it does not give attention to an individual slow learners.

#### **2.4.4 Group work method**

It is a method which helps an individual to learn about a subject through interpersonal exchange of information and ideas in a group situation, whereby ten or twelve persons participate. The method involves the group in active thinking process, which stimulates critical thinking amongst the members of the group.

Advantages of group work:

- a) Different members come up with different ideas and methods of learning hence quality work
- b) It spreads responsibility, encourages creativity, deepens friendships among learners
- c) Work burden is reduced

Disadvantages of group work:

- a) Most active learners tend to dominate the learning process and others do little participation.
- b) Poor attitude of learners to learn new knowledge in a group
- c) Lack of learners training materials

These limitations can, however, be overcome by reducing the size of the group or conducting the group discussion through buzz session. In any case the usefulness of group discussion is only when it is conducted in a guided manner and when the group leader ensures that the discussions do not deviate from the major theme.

## 2. 5 Gaps in Practical Training methods

The researcher employed knowledge from related literature to illustrate how practical training methods are applied by both lecturers and technicians.

**Table 2. 1: Gaps in the practical training methods**

| Method        | Gaps                                                                                                                                                                                                       |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Demonstration | (a) Large number of learners<br>(b) Lack enough time to prepare Practical<br>(c) Lack competent trainers to handle the tasks<br>(d) Lack of training facilities<br>(e) Lack of learners training materials |
| Group work    | (a) Most active learners tend to dominate the learning process and others do little participation.<br>(b) Lack of attitude to learn to learn new knowledge<br>(c) Lack of learners training materials      |
| Explanation   | Requires the instructor to have effective writing and speaking skills<br>Hinders learning<br>Hinders the lecturer from learning the problems of learners                                                   |
| Brainstorming | Brings hindrance which reduces on an individual's creativity                                                                                                                                               |

Source: Adopted from Wehrli (2003)

## **2.6 Traditional Approach in Practical Training**

Broadly speaking training as a concept is generally perceived as a learning process. However, traditionally the process refers to the transfer of knowledge from trainer to the trainee. The trainer in the traditional system generally decides on such issues as:

- i) Who are the persons to be trained?
- ii) On what aspects is the training to be imparted?
- iii) What methodology has to be followed for the training?
- iv) What is the expected benefit of the training?

From the traditional point of view, the trainer was the dominant actor and the trainee the silent receiver of the message. The trainer-trainee relationship under the system was characterized by unquestionable 'instructor' and obedient learner. In this process no consideration was made for the training needs and the whole training activity was dominated by the sole decision making role of the trainer.

This approach was quite similar to the one adopted for formal schooling. Traditional approach of training methodology was based on certain preconceived notions like automatic transfer of knowledge from its 'owner' – the trainer, to the 'receiver' - the trainee. The effectiveness of any training activity largely depends on the capacity of the trainer to 'instruct' or 'teach', while the corresponding capacity of the learner depends on how to 'learn' or to 'perceive'.

## **2.7 Thrust on User Need Basis on Participatory Approach**

The difference between the traditional approaches, in the process of training, to participatory approach is that in participatory, the thrust is on the transfer of knowledge/expertise from trainer to learner; this forms the modern approach to training and is characterized by a thrust on change and growth. The emphasis of training in the new approach is not so much on transfer of knowledge but as on the process of growth, which aims at the desirable change of knowledge, attitude and practices. Here the process is characterized by promoting trainees' critical consciousness and value judgment. The process starts with 'in freezing' the set notions, and the process of 'de-learning to re-learning'. There is more realism in this type of training as this is a user need based learning process, whereby the structure

and strategies of the training are designed in the light of a Training Needs Assessment (TNA).

The rationale of this guiding principle enables trainees to be more responsive and receptive to such training. The undercurrent is an ongoing process of learning, where by both the trainer and the trainees participate as learners. This training generates a sense of self-confidence.

The concept of participatory training has been evolved in the light of the new approach of training, where the trainees participate actively in the learning process. It has been found to be an effective instrument in economic progress and ecological development programmes. Table 2.2 illustrates some of the characteristics that go with the above approaches.

**Table 2.2: Training Approaches**

| <b>Traditional Approach</b>       | <b>Participatory Approach</b>                       |
|-----------------------------------|-----------------------------------------------------|
| Learning as a product             | Learning as a process                               |
| Teacher controlled                | Learner centred                                     |
| Transfer of knowledge             | Discovery of principles                             |
| Trainer is the expert             | Trainer is the facilitator, resource                |
| Learner knows nothing             | Learner is full of capacities, knowledge of reality |
| Learner is passive                | Learner is active, discovering and receptive.       |
| Encourages conforming and, coping | Stimulates Independent thought, creative            |

**Source: Adopted from Singh (1992)**

Learning occurs through interactive teamwork and is influenced by a shared, practical environment. Peer-assisted learning and team building were positive in the learning process.

## **2.8 Improve Practical Training Methods**

Related Literature to support improving practical training according to future workshop in DMPE will adopt a learner centred training which increases motivation in learning and cultivates greater satisfaction with learning process. These outcomes

lead to greater achievement of knowledge and skills, higher rates of student retention and have better-prepared graduates for world of work.

However, there are disadvantages like; more time is required and ready materials for interaction. But the Head of Department who is also the participant, promised to do whatever it takes to see improvement in learners training at DMPE.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.0 Overview**

This chapter presents information on aspects of methodology that were used in his study. These include the research design, sample size and sampling techniques, instruments/tools for data collection and analysis techniques.

### **3.1 The Research Design**

This study was qualitative-descriptive in nature because we were concerned with answering questions such as what, how, which, when and why. This procedural plan was adopted to answer questions validly, objectively, accurately and economically to present accurate answers to the research questions (Kumar, 2005).

### **3.2 Study Population and Sample Selection Criteria**

The sample size was determined by the staff members in the staff members teaching production technology and second year students of higher diploma mechanical and manufacturing engineering.

#### **3.2.1 Study Participants**

The participants of this study included the Head of department, lecturers and technicians in the department of Mechanical & Production Engineering who are the stakeholders in the teaching process. This is in agreement with Billet (2001) who stressed that, engagement of stakeholders in problem solving ensures implementation of the suggested solutions by all stakeholders.

#### **3.2.2 Sample Selection**

The categories of participants in the study are shown in Table 3.1. Sampling techniques includes purposive, census, voluntary and random. Participants for this research were selected either by purposive technique or census technique.

According to Onen (2009) purposive sampling is where a researcher decides who to include in the sample based on their typicality. The technique was selected because it selects typical, useful respondents, and considered four (4) Lecturers, four (4) Technicians those who teach production technology.

Census technique is where all the participants are involved mostly for smaller groups. This technique was used to bring HOD and 11Learners of Higher Diploma offering Mechanical who are former graduates of Kyambogo University and did an ordinary diploma in mechanical engineering where production technology was among the courses they took and head of Mechanical department as the overall supervisor.

**Table 3.1: Accessible Population and Sample Size for the Study**

| NO.   | Population Category | Total Population | Target Sample | Sampling Method |
|-------|---------------------|------------------|---------------|-----------------|
| 1.    | HDM II Learners     | 11               | 11            | Census          |
| 2.    | Lecturers           | 17               | 4             | Purposive       |
| 3.    | Technicians         | 8                | 4             | Purposive       |
| 4.    | HOD                 | 1                | 1             | Census          |
| TOTAL |                     | 37               | 20            |                 |

**Source: Field data (2015)**

### **3.3 Methods of Data Collection**

The researcher collected data through observations and interviews from two places of World of Work (WOW) where competencies of a foundry technician were used to conduct a future workshop at the department.

#### **3.3.1 Primary Sources of Data Collection**

The researcher used primary data from situation analysis at WOW in the study and carried out a future workshop on the competencies of a foundry technician in the DMPE.

### **3.3.2 Secondary Sources of Data Collection**

The researcher visited the library to conduct archival survey for secondary source of data collection. According to Wangusa (2007) library and archival survey method of data collection enhances the analysis of the findings in relation to the objectives of the study as well as the relationship of the extension strategies used by the developed countries. In the library and archival survey, the researcher examined documents such as reports, journals, and textbooks with content related to the study.

### **3.3.3 Research Instruments**

The research instruments used in this study included: questionnaires, interview schedules, observations and focus group discussion (FGD) guides.

### **3.4 Work Process Analysis**

In order to improve the student's practical training at the department, we referred to competences from world of work to ensure that our graduates meet market demand. This was to ensure that job process analysis of a foundry technician as discussed by Porter (1992) and Kleiveland (1994) procedures were followed. In addition we examined the course content of production technology, background of lecturers and technicians teaching production technology, tools and materials, time allocation documentary analysis, qualitative interviews, group discussions, photography and participatory observation.

### **3.5 Future Workshop**

Future Workshop as an action research method is used to solve questions or problems perspective of the future. It was originally developed for citizen groups with limited resources who wanted a say in the decision making process. It is meant to shed light on a common problematic situation, to generate visions about the future, and to discuss how these visions can be realised. It was developed by Robert Jungk and Norbert Mullert in the 1970's (Apel, 2004).

This method involves the participants of a project in the process of working out solutions according to the existing situation. The method is an intuitive and analytic way to highlight problems and look for suggestions to solve them. The Future Workshop can be transferred to situations of educating and learning. In this study, the Future Workshop was used to find ways of improving student's practical training in production technology and is made up five phases.

### **Planning Phase**

Participants in the department including lecturers, technicians, learners and head of department were invited by HOD in the staffroom after giving them prior notice.

### **Critique Phase**

The researcher introduced the topic to be discussed in the workshop titled "what are the challenges hindering student practical skills acquisition in the course of production Technology?" Through brainstorming challenges were listed down. These included:

- Loss of interest in the course by both learners and lecturers
- Lecture method of content delivery,
- Inadequate coverage of content,
- Poor emphasis of practical training,
- Inadequate training materials,
- Part time lecturers don't get regular payments,
- Different training equipment in university compared to those in industry,
- Blocked sewages and over grown trees
- Little time for practical,
- Poor linkages between theory and practicals,
- Lack of chairs, toilets and class rooms.

## **Visualised Challenges**

Participants fantasised and reached the realisation phase from the above challenges and came up with the following tasks to be handled in the DMPE. These included: setting standard assessment for practical exercises, using relevant methods of content delivery, preparing applicable practical exercises, and performing continuous research.

## **Fantasy Phase**

At the beginning of the fantasy phase the researcher asked the participants to discuss the solutions that would solve the challenges hindering student practical skills acquisition in the course of production Technology without referring to any limitations such as money, time and expertise. The fantasy phase generated a list of possible factors as presented below:

- Setting standard assessment for practical exercises
- Using relevant methods of content delivery.
- Preparing applicable practical exercises.
- Performing continuous research
- Going for refresher courses
- Integrating theory with practical.

## **Implementation Phase**

This is the reality phase where realistic and practical solutions were listed down and the best suited solution was chosen. The solutions were as seen below:-

- Lecturers and technicians were assigned the following; Set standard assessment for practical exercises, Prepare applicable practical exercises, Perform continuous research and go for refresher courses, Integrate theory with practical and Conduct practical exercises as a team.
- Learners were required to attend classes and practical training and avoid strikes
- The head of department was to procure training materials
- The researcher was given to look into the relevant methods of content delivery

The implementation phase of future workshop allowed the participants to draw action plan so as to implement the implementable solutions as shown in Table 3.2.

**Table 3.2: Action Plan**

| Activity                                               | Responsible person                      | Duration (months) | Remarks |
|--------------------------------------------------------|-----------------------------------------|-------------------|---------|
| Conduct practical exercises as a team.                 | All lecturers and technicians           | 4                 | Done    |
| Attend classes and practical training                  | All learners, lecturers and technicians | 4                 | Done    |
| Integrate theory with practice                         | All learners, lecturers and technicians | 4                 | Done    |
| Establish and improve methods of content delivery used | The researcher and all the stakeholders | 6                 | Used    |

**Source: Field data (2015)**

### 3.6 Documentary Analysis

Documentary analysis is the method that involves deriving information by carefully studying written document, or visual information from sources called documents (Mertens, 2005). Here the researcher used: textbooks, newspapers, journals, learners portfolios and articles.

### 3.7 Interviews

Interviewing is a theoretical approach to data collection, an engaging form of inquiry, and an appropriate method for collecting data regarding human experiences According to Reinhartz (1992), “interviewing offers researchers access to people’s ideas, thoughts, and memories in their own words, rather than the words of the researcher”.

### 3.8 Follow Up

This phase is also known as permanent workshop, where participants make a follow-up to assess the success or problems encountered while trying to solve the problem and find the way forward. The process of follow-up and reviewing techniques continued on and on in a spiral manner as illustrated in figure 3. 2.

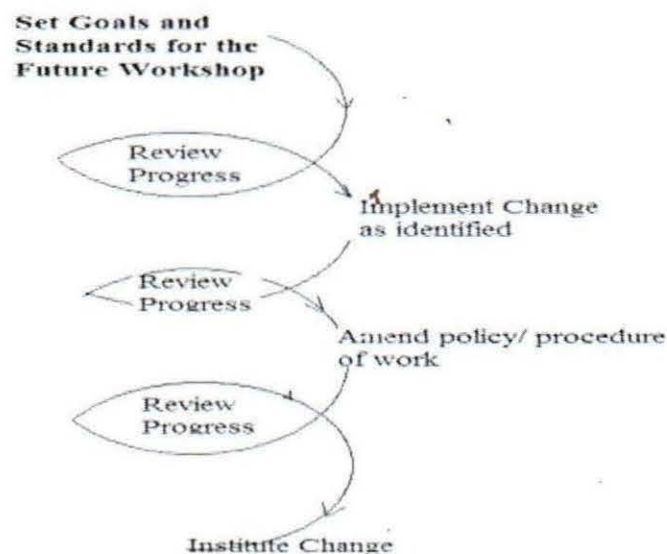


**Figure 3.1:** A spiral loop showing projection goals to be reviewed against the objectives

Source: Adopted from Pratt et al (2001)

### 3.9 Participant Observation

This provided the researcher with privileged access to research subjects in a social situation and captured the context of the social setting in which individuals functions were recorded subjectively and objectively. The researcher became part of the process being observed and immersed in the setting, hearing, seeing, and experiencing the reality of the social situation with the participants. Thus, the researcher as a participant-observer not only observed activities, participants, and physical aspects of the situation, but also engaged in activities appropriate to the social situation in agreement with Spradley (1980).

### **3.10 Photography**

Photography is defined as the process of producing images by the action of radiant energy and especially light on a sensitive surface (Donaldson, 2001). A number of photographs were taken during the future work shop and implementation phase because they enable the researcher to recall some vital aspects that transpired during the field study time. This is supported by Buchanan (2001), who argued that in some cases photos are used as a photographic record of the research process to supplement other kinds of data. A camera and a video recorder are the tools that were used during the demonstration process.

### **3.11 Focus Groups Discussions**

Focus groups are considered a socially orientated process and form of group discussions that capitalizes on communication between the researches participants in order to generate data (Kitzinger, 1995). A focus group generally consists of seven to twelve individuals who share certain characteristics relevant to the focus of the study (Marshall and Rossman, 2006). The focus group discussions were used especially during problem formulation, data collection and validation and report writing. This is due to the fact that participatory action research approach maintains that problems are not defined by experts but should be based on group discussions (Mikkelsen p. 36-37). This method helped me to understand participants responsibilities, interests, needs, availability for the research process and plans for improvement.

### **3.12 Data Analysis**

Data gathered was analysed qualitatively and a descriptive approach used. Data analysis is a process of inspecting, cleaning, transforming and modelling data with the goal of highlighting useful information, suggesting conclusions and supporting decision making. This understanding of the concept of data analysis is supported by (Ary et.al., 2010) where they assert that data analysis involves reducing and organising data, synthesizing, searching for significant patterns and discovering what is important for the study.

### **3.12.1 Transcription of Data**

This is the first step in the analysing qualitative data and (Ary et al., 2010) refer to it as familiarising and organising of data. In this step, the researcher logically documented data gathered from the future work shop and group dialogues with participants.

### **3.12.2 Coding and Categorization**

Mikkelsen (2005) argues that a useful way of organising qualitative data for analysis is coding where a researcher organises raw data into conceptual categories and creates themes or concepts that are used to analyse data. The data was analysed into immediate, medium term and long term. As participants we dealt with immediate challenges.

### **3.12.3 Presentation**

The researcher presented the results according to the objectives and outcomes as participants had performed.

### **3.13 Validity**

Validity is ordinarily used to refer to the truth, correctness and strength of a statement or knowledge claim. A valid argument is always sound, well grounded, justifiable, strong and convincing or the extent to which our observations indeed reflect the phenomena, situation or variables of the interest to us (Kvale and Brinkmann, 2009). For the purpose of this research, triangulation of methods was used to ensure validity. Triangulation is perceived as the use of different methods to obtain views on the same object of the study. This concept is supported by Diane Millar where she suggests that it is better for action researchers not to rely on only one source of information or on one method of data collection or on one tool of data collection tool (Millar, 2008). She argues that research is stronger if the information is collected in many ways and that triangulation helps in providing more meaningful data analysis. For purpose of this study, the researcher used different methods which include: participant observation,

interviews, focus group discussion, photography, document analysis, future workshop and work process analysis. Furthermore, different data collection tools which include the tutors' journal, camera and audio recorder were used with an intention that each method or tool supplements the results obtained using the other remained the same.

### **3.14 Limitations of the Study**

This study employed a paradigm that requires time to implement i.e. action research. The findings of this type of approach are valid only after observing change in behaviour of the sample trainees. In other words, the impact of action is only observed after a period of implementation of the desirable teaching methods by the trainers that is to say the student's performance should improve or otherwise. The current study was expected to be executed in phases to the extent that learners must be given time to demonstrate skills in the world of work and then be evaluated by both consumers and trainers. The research had some limitations with respect of the methodologies of action this being a relatively new research action in Uganda.

In addition, limited financial resources for facilitating scouts / agents and lack of cooperation from stakeholders who wanted to be facilitated for each consultative meeting were also another limitation.

### **3.15 Ethical Considerations**

The head of department, mechanical and production engineering, granted permission to conduct the meetings. Equal freedom to participation was accorded to each participant and confidentiality was promised to all.

## **CHAPTER FOUR: PRESENTATION, INTERPRETATION AND ANALYSIS OF DATA**

### **4.0 Overview**

This chapter introduces us to the data collected according to the three objectives:

- i) To establish the practical training methods that are used to teach production technology at the DMPE at Kyambogo University.
- ii) To identify the gaps of the above mentioned methods on the level of skill acquisition of the learners.
- iii) To provide suggestions for improving the practical training methods at DMPE so as to enhance skills acquisition of the learners.

### **4.1 Practical training methods used in teaching production technology at the DMPE**

From the concept of traditional approach versus participatory approaches in literature review, documentary analysis of the related literature, time table and course outline, was used to know what was to be taught and when it was taught. From the time table the researcher taught eleven higher diploma learners in production technology IV (foundry and advanced welding) 8.00am-10.00am and DME 425 group project 11.00am-5.00pm the same day.

To identify the training methods used, we employed a questionnaire as a tool which was responded to by the lecturers and the technicians teaching production technology and the students who were required to list at least four most used teaching methods (Appendix I). Table 4.1 shows the practical training methods that were being used:

**Table 4.1 Methods applied in teaching production technology at DMPE**

| Methods applied | Occurrence |
|-----------------|------------|
| Group work      | 6          |
| Demonstration   | 8          |
| Explanation     | 5          |
| Research work   | 4          |
| Brain storming  | 4          |

**Source: Field data (2016)**

The most applied methods listed were demonstration and group work these occurring eight times and six times respectively. Thus, it's the most appropriate teaching method for production technology. This is mainly because demonstration and group work give learners a chance to experience real tasks in life which are a motivating factor in learning process. Research work had the least occurrence. This was mainly attributed to the fact that research work mainly develops the learners' knowledge not the skills.

#### **4.2 Identified gaps in practical training methods used in teaching production technology at DMPE**

A number of gaps were identified in the different practical training methods that were being used in the training process.

##### **4.2.1 Demonstration**

A number of gaps were identified by the respondents in the respondents practical training method as shown in Table 4.3

**Table 4.2: Gaps identified in the demonstration method of teaching**

| Gaps                                            | Occurrence |
|-------------------------------------------------|------------|
| Large numbers of learners.                      | 1          |
| Lack of enough time to prepare practical.       | 2          |
| Lack of competent trainers to handle the tasks. | 2          |
| Lack of training facilities.                    | 3          |
| Lack of learning materials.                     | 3          |

**Source: Field data (2016)**

From the table 4.3 lack of training facilities and training materials are the main gaps in demonstration teaching method.

#### **4.2.2 Group work**

**Table 4.3 Gaps identified in the group work method of teaching**

| Gaps                              | Occurrence |
|-----------------------------------|------------|
| Partly participation of learners. | 1          |
| Poor attitude towards the method  | 1          |
| Lack of training facilities       | 3          |
| Lack of learning materials.       | 6          |
| Inadequate time.                  | 2          |

**Source: Field data (2016)**

From the table 4.4 lack of learning materials is the main gap in group work teaching method.

#### **4.2.3 Explanations**

**Table 4.4 Gaps identified in the Explanation method of teaching**

| Gaps                                            | Occurrence |
|-------------------------------------------------|------------|
| Lack of competent trainers to handle the tasks. | 4          |
| Lack of teaching aids.                          | 3          |
| Inadequate time.                                | 1          |
| Inadequate motivation.                          | 3          |
| Partially participation of the learners.        | 2          |

**Source: Field data (2016)**

From the table 4.5 lack of competent trainers to handle tasks is the main gap in explanation teaching method.

#### 4.2.4 Brain storming

**Table 4.5 Gaps identified in the brainstorming method of teaching**

| Gaps                                   | Occurrence |
|----------------------------------------|------------|
| Lack of teaching aids.                 | 3          |
| Inadequate motivation.                 | 2          |
| Partial participation of the learners. | 2          |
| Inadequate time.                       | 1          |
| Lack of creativity and originality.    | 5          |

**Source: Field data (2016)**

From the table 4.6 lack of creativity and originality was the main gap in brainstorming teaching method

#### 4.2.5 Experimentation

**Table 4.6: Gaps identified in the explanation method of teaching**

| Gaps                                            | Occurrence |
|-------------------------------------------------|------------|
| Lack of learning materials.                     | 5          |
| Lack of competent trainers to handle the tasks. | 2          |
| Lack of training facilities.                    | 2          |
| Lack of training facilities                     | 3          |
| Large number of learners.                       | 1          |

**Source: Field data (2016)**

From the table 4.7 lack of learning materials was the main gap in experimentation teaching method.

#### **4.3 Suggestions for improving the practical training methods at DMPE so as to enhance skills acquisition of the learners**

- i. There must be enough training materials for learners to practice as the technician is demonstrating so that they move at the same pace to ensure that skills acquisition is achieved.
- ii. There should be enough training tools so that participatory learning is possible especially when the type of demonstration is stage by stage
- iii. There should be motivation in student learning process with a good number of teaching AIDS like video clips and simulations to ensure that student's curiosity to learn is not killed
- iv. Learners should be brought on board by finding out their past experiences and group them according to experience for better planning of learning exercises to keep them interested in the learning process.
- v. The Technician should have enough competence to demonstrate the task to learners and allocate them appropriate time to do the task.

For the trainer to achieve the effective method, two considerations are important and according to Michael (1997), these included:

- (1) Proper selection of personnel i.e. choosing the right person for the right training.
- (2) Human resources development-through training intervention, helping them to learn in order to bridge the performance gap, if any, and make them proficient. The component of development may also be added to this process. For example you may guide a trainee how to cut squarely a piece of metal if he is failing, in doing that his skill will be developed. Research findings identified many practical training methods used in teaching production technology at the department of mechanical and production engineering of Kyambogo University. Among those we looked at, the most effective method by Pugh matrix answered by a focus group which includes lecturers, technicians, higher diploma learners, and Head of DMPE came up with two

(3) methods being: demonstration, hands on and group discussion as the most effective but needed further improvement to enhance skills acquisition in learners.

## CHAPTER FIVE: CONCLUSION, DISCUSSION AND RECOMMENDATIONS

### 5.0 Overview

This chapter consisted of the conclusion, discussion and recommendations which were guided by the objectives of the study.

### 5.1: Introduction

The researcher conducted a practical exercise in foundry technology with higher Diploma learners who were part of the focus group using whole process demonstration method from the 1<sup>st</sup> activity of sand preparation to the final activity of casting a product. It is important for the reader to know how these methods are used;

**Group Work** means active and fairly independent interactive learning that is generally used to strengthen knowledge. The group processes information supplied and then comments, assesses and applied it. Group work is applicable as an activating element in all training and is especially useful if attempting to change attitudes.

**Group work method** according Singh (1999) is a method which helps an individual to learn about a subject through interpersonal exchange of information and ideas in a group situation, whereby ten or twelve persons participate. The method involves the group in active thinking process, which stimulates critical thinking amongst the members of the group. The limitations of this method are that it is a relatively slow moving process and there is always a likelihood of the process being dominated by the talkative and those opting for less talk and more thinking may be sidetracked. Also in a large group an opportunity to express gets diluted. These limitations can, however, be overcome by reducing the size of the group or conducting the group discussion through buzz session. In any case the usefulness of group discussion is only when it is conducted in a guided manner and when the group leader ensures that the discussions do not deviate from the major theme.

**Demonstration:** The demonstration is a method based on presentation that shows how to perform an act or use a procedure. It is often followed by the activity under the

guidance of the instructor. Sometimes this method is also used to demonstrate the impact of a new practice in contrast to the old one.

Demonstration involves showing by reason or proof, explaining or making clear by use of examples or experiments. In simple terms, demonstration means 'to clearly show'. Demonstrations often occur when learners have difficulties in translating theories to actual practice or when learners are unable to understand application of theories.

Teachers not only demonstrate specific learning concepts within the classroom, they can also participate in demonstration classrooms to help improve their own teaching strategies, which may or may not be demonstrative in nature. Although the literature is limited, studies show that the effects of demonstration classroom teachers includes a change of perspective in relating to learners, more reflection in the teachers' own classroom strategies, and more personal responsibility for student learning.

According to Chikuni (2003), there are two types of demonstrations namely;

1. Step by step demonstration

For Gwarinda (1993) the step by step demonstration is done stage by stage with teacher explaining each action as the operation proceeds. Chikuni (2003) also notes that the step by step demonstration takes place when the process is presented in stages that are inter- spaced.

2. Whole process demonstration

In the whole process demonstration, the teacher demonstrates the full process from the beginning to the end without interruption by learners' participation (Chikuni 2003). For instance, the teacher shows how to carry out moulding processes from sand mixing to pouring stage while learners are watching. Soroka, Hoagland and Mohale (1977) assert that the whole process demonstration enables the learners to have a clear view of the process.

However, the former type of demonstration is known as 'method demonstration' while the latter is known as 'result demonstration'. This method has the advantage of greater impact on the learner in terms of adding to his existing level of knowledge and skills. This method is known to be based on the principles of 'seeing is believing' and

'learning by doing'. Of course, result demonstration cannot be conducted in a classroom situation. During field trips or study tours the trainees can be given some idea about result demonstration. For example, the trainees can be shown a foundry workshop where modern practices have been adopted. The comparison between the success and failure models can be used as a method of result demonstration.

**Brainstorming:** The use of this method is generally made as a first step to generate initial interest and essential involvement of the trainees in the training activity. For this, the trainers ask the learners any question to generate ideas that can be discussed later for practical consideration. Sometimes 'unwanted' or seemingly ridiculous ideas lead to a more practical idea which would otherwise not have been considered. Much as brain storming is good at generating ideas although it does not develop the practical skills that are required of a learner.

**Explanation:** Explanation is the most used instructional method. It is often referred to as the lecture method. Presentation or chalk talk if used well it can facilitate effective learning by conveying key facts, concepts and principles this will provide a framework to guide the learners through atopic and stimulating interest in the subject.

- Attributes good explanation
- Effective explanation is characterised by the following:
- Clear statement and examples of relevance to the learners.
- Logical organisation of information with appropriate examples to illustrate concepts and principles.
- Linking of key topics, concepts and principles
- Clear engagement style of presentation.
- Opportunities for student involvement.

## **5.2 Conclusions**

None of the mentioned methods is singularly suitable or sufficiently effective for any training activity. Every method has its own advantage or disadvantage. It is from this angle of understanding that there is need to make proper selection of teaching methods quite carefully, taking into account a number of factors and going for the

most appropriate ones. However, each method can be used more effectively if the trainer is well versed with the related skills to be taught. Research findings identified Hands-on Demonstration, explanation and Group work as being the most effective but needed further improvement to enhance skills acquisition in learners.

Gaps identified in the present practical training methods in production technology at the DMPE like large number of learners, lack enough time to prepare practical, lack competent trainers to handle the tasks, lack of training facilities and lack of learners training materials can only be solved by intervention of the management.

This study found out that if the graduates of this program are to meet the challenges of the ever dynamic technology labour market and the ability to effectively perform, the present teaching methods must be broadened to accommodate the already emerging diverse innovations in production technology.

### **5.3 Current practical training methods**

#### **5.2.1 Demonstration**

There are various methods of teaching practical and the choice of teaching methods to use is affected by many factors such as content, time, and ability of learners to learn, group size as well as the teachers' personal preference (Andruszyn 1990). Mutasa and Wills (1995) propound that the demonstration method involves the teacher showing learners how to carry out a practical while they observe.

Learners practice will follow the teacher's demonstrations. According to Chamberlain and Kelly (1981) demonstrations are used to show procedures and to explain techniques. Thus, demonstration is a direct means of explaining things to the learners. Chikuni (2003) also states that demonstration is where the teacher shows how something is done by actually doing it. According to Child (1988), a child learns better through imitating. Kudu and Tutoo (2002) concur with Child when they state that Banduras bobo doll experiment showed that children learn through imitation. In support of this, Hendrik (1986) figured out that children learn vicariously through emulation. Therefore the demonstrations ought to be done correctly for learners to copy the correct ways of doing things. The researcher is in agreement with Gwarinda (1993), who said that demonstration method enhances translation of theory into

practice. Soroka, Hoagland and Mohale (1977) propound that the demonstration method should be used to impart skills. That is why this method is often opted in the teaching and learning of practical subjects.

Gwarinda (1993) concurs with Soroka, Hoagland and Mohale (1977) who affirm that demonstration involves teaching pupils how a specific skill is executed. This method is recommended for teaching a skill because it enables covering of all the necessary steps in a process (Petty 2000). Thus, the demonstration method gives learners the opportunity to see and hear the details related being taught. According to (Keachie, 1986) these details include the necessary background knowledge, steps or procedure and precautions.

According to Smith (1998), demonstration must be used in a manner that suits the needs of the learner. It has been propounded by Chikuni (2003) that, there are two types of demonstrations, namely the step by step and the whole process demonstration. In the whole process demonstration, the teacher demonstrates the full process from the beginning to the end without interruption by learner's participation (Chikuni 2003).

For instance, in the 1<sup>st</sup> phase I demonstrated the whole process molding of a pulley showing how to prepare sand to the end until we melted and casted.



**Figure 5.1: Teacher demonstrating the moulding process to learners**

**Source: Field data (2016)**



**Figure 5.2: Casting after teacher demonstrating a whole process**

**Source: Field data (2016)**

The 2<sup>nd</sup> phase learners were given chance to mould following the processes by making their own mould ready for pouring and it collapsed on lifting it for pouring.



**Figure 5.3: Learners re- doing the Moulding process**

Source: Field data (2016)



**Figure 5.4: Learners sieving moulding sand**

Source: Field data (2016)

Soroka, Hoagland and Mohale (1977) assert that the whole process demonstration enables the learners to have a clear view of the process.

The 3<sup>rd</sup> phase learners were given chance to repeat the task after discussing the possible causes of the previous failure with the instructor and they got it right.



**Figure 5.5: Learners perceive added skills from the instructor**

**Source: Field data (2016)**

For Gwarinda (1993), the step by step demonstration is done stage by stage with teacher explaining each action as the operation proceeds. Chikuni (2003) also noted step by step demonstration takes place when the process is presented in stages that are inter-spaced by learner's participation. For example, when moulding a pulley, the researcher demonstrated how to prepare sand with the correct mixture content and learners also did the same. The researcher continued to the second stage of molding with the pattern and they also did that correctly. He closed the mould with the second half (cope) with its sprues and learners also did it correctly and they melted scrap and poured it into both moulds and got out their castings as expected.

### **5.3.2 Group work Method**

Group work means active and fairly independent interactive learning that is generally used to strengthen knowledge.

According to Singh (1999), Group work is a method which helps an individual to learn about a subject through interpersonal exchange of information and ideas in a group situation, whereby ten or twelve persons participate. The method involves the group in active thinking process, which stimulates critical thinking amongst the

members of the group. The limitations of this method are that it is a relatively slow moving process and there is always a likelihood of the process being dominated by the talkers and those opting for less talk and more thinking may be side-tracked. These limitations can, however, be overcome by reducing the size of the group or conducting the group discussion through buzz session. In any case the usefulness of group discussion is only when it is conducted in a guided manner and when the group leader ensures that the discussions do not deviate from the major theme.



**Figure 5.6: Learners in a discussion group**

**Source: Field data (2016)**

After group discussion with the instructor, a similar task was given to learners alone to carry out the molding process and it was also successful. Group work method works better with small number of learners according facilities; it requires very competent trainers to avoid errors, training materials should be in place and it requires more time to benefit learners.

The researcher concurs with the ten commandments below according to Singh (1999), that it has a lot to remind trainers on how to carryout training /learning process in order to achieve intended objectives:

- i. Share learning with the trainees, rather than imparting knowledge to them.
- ii. Be creative yourself and also encourage the trainees to be creative.

- iii. Supplement your talk by suitable illustrations with a view to make your presentations more interesting by using different types of visuals like video clips, drawings, models and samples.
- iv. Start the talk by inculcating in the trainees an interest in the subject matter being covered and end up by creating a curiosity to learn more about the topic in future.
- v. Make maximum use of two-way communication by inviting comments and queries from the trainees and sharing your views with them.
- vi. Remember, the job of training learners is not only to build a potential cadre of trainers for preparing functionaries for different development activities, but also inspire, encourage and enthuse them to be the facilitators of a self-sustaining growth process through participatory approach.
- vii. Assess the impact of your role as a committed and competent trainer and do it as objectively as you can. This can be done by constant monitoring of the extent to which the trainees have been receptive, responsive and reinforced by the information input provided to them.
- viii. Equip yourself with knowledge of recent developments in the materials and methods of training skills. This can be done by keeping yourself in touch with the latest literature and widening your knowledge by frequent interactions with those who have earned a 'status' of a successful professional in the field of training.
- ix. Inculcate a sense of ideal role performance while facilitating training. The success of such efforts can be judged in terms of someone of your trainees following your example while himself/herself practicing the same principle as a trainer.
- x. Finally, continue to think and act on developing new tools and techniques which may further enrich the exciting area of training.

By doing this you will not only share an experience of excitement and achievement, but also a feeling of pride and privilege.

Action taken from the future workshop given to various stake holders in the Department managed to do the following possible activities;

- a) Training is no longer taught in isolation but as a team both lecturers and technicians to avoid mismatch of content.
- b) Practical related lessons are now taught in laboratories and workshops for easy linkage theory to reality

- c) Learners attend practical regularly and have not made any strike so as to miss out any practical due for them.
- d) Head of Department for Mechanical and Production Engineering has procured some training materials for student to practice.
- e) Content delivery method is by use of soft copy like projectors and video clips and learners are given all the assignment for the semester ahead of time for them to read ahead so as to improve on time management.

#### **5.4 Gaps in teaching methods**

In Demonstration method the researcher and the participants identified the following gaps: Large number of learners; Lack enough time to prepare Practicals; Lack of training facilities; Lack of learners training materials. Also according to (Wehrli 2003) he emphasized that large number of learners; lack enough time to prepare Practicals; lack of training facilities and lack of learners' training materials were the main gaps faced during demonstration method of teaching practical.

In Group Work method, the gaps identified by the researcher and the participants were: most active learners tend to dominate the learning process and others did little participation, lack of attitude to learn new knowledge, lack of learners training materials. Nyquist (2003) said that most active learners tend to dominate the learning process and others do little participation, lack of attitude to learn new knowledge, lack of learners training materials are the challenges encountered during teaching using group work method.

#### **5.5 Improving practical training methods**

- i. There must be enough training materials for learners to practice as the technician is demonstrating so that they move at the same pace to ensure that skills acquisition is achieved.
- ii. There should be enough training tools so that participatory learning is possible especially when the type of demonstration is stage by stage

- iii. There should be motivation in student learning process with a good number of teaching AIDS like video clips and simulations to ensure that student's curiosity to learn is not killed
- iv. Learners should be brought on board by finding out their past experiences and group them according to experience for better planning of learning exercises to keep them interested in the learning process.
- v. The Technician should have enough competence to demonstrate the task to learners and allocate them appropriate time to re do the task.

## **5.6 Recommendations**

Kyambogo University and the Department of Mechanical and Production Engineering should recruit more technical staff in practical areas to be able to use the above identified methods effectively without which good methods alone cannot improve training that we are advocating for.

It is also important to note that good methods will be effective when the facilities to be used are in good working condition therefore repairs are immediately required for faulty machines.

For the large numbers of learners in the Department to benefit from these methods we need to have another shift so as to fulfill the conditions of these methods because they require a little more time than lecture method which can handle large numbers at once.

Institutions should foster closer ties with industries to enable learners acquire some of the skills since the institutions may not have all the needed facilities.

## **5.7 Suggestions for further studies**

Other areas for further research include studies on;

- i. Relationship between training facilities and production of self-sustaining graduates.
- ii. Relationship between the competence levels of instructors and production of self-sustaining graduates

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## **Appendix I: RESEARCH TOOLS USED**

To identify the training methods used we employed questionnaire as a tool to identify the training methods used in production technology.

**DEPARTMENT      MECHANICAL      AND      PRODUCTION      ENGINEERING**  
**KYAMBOGO UNIVERSITY**

**Tool for identifying student practical training methods used in production technology**

**1. Please mention four methods you apply when teaching Practicals in production technology.**

.....  
.....  
.....  
.....

**2. Which method do you think is most effective for training Practicals in production technology?**

.....

**3. Give reasons for the above method.**

  
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**Faculty of Vocational of Studies**

*Department of Art and Industrial Design*

**Masters in Vocational Pedagogy**

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30<sup>th</sup> May, 2016

*Deputy Principal training  
Nakawa Vocational training Institute*

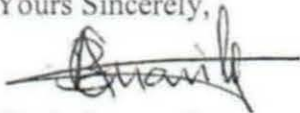
**RE: INTRODUCTION OF BOGERE PAUL**

This comes to introduce to you **BOGERE Paul** a student of Masters in Vocational Pedagogy (MVP) Programme at Kyambogo University. This student bears registration no. **14/U/12910/GMVP/PE** and in his final year. As a requirement for graduation, this student is expected to carry out Action Research through a collaborative process with World of Work.

Any support rendered to him is highly appreciated.

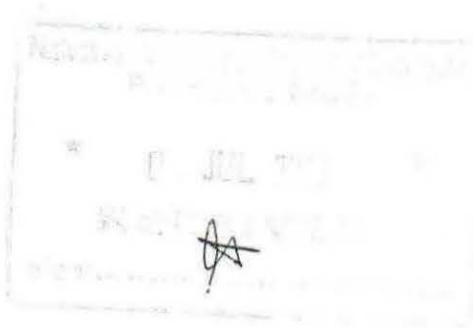
Looking forward to your usual support.

Yours Sincerely,



**Chris Serwaniko**

Project Coordinator, NORHED MVP Program  
Masters in Vocational Pedagogy Program



  
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P. O. Box 1 Kyambogo University Tel: 0414 287117

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30<sup>th</sup> May, 2016

MANAGER JOHN LUGENDO AND COMPANY  
Box 321 NDEERA - KAMPALA

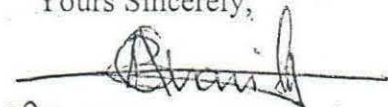
**RE: INTRODUCTION OF BOGERE PAUL**

This comes to introduce to you **BOGERE Paul** a student of Masters in Vocational Pedagogy (MVP) Programme at Kyambogo University. This student bears registration no. 14/U/12910/GMVP/PE and in his final year. As a requirement for graduation, this student is expected to carry out Action Research through a collaborative process with World of Work.

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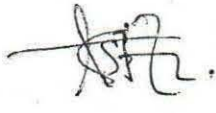
Looking forward to your usual support.

Yours Sincerely,



PS Chris Serwaniko  
Project Coordinator, NORHED MVP Program  
Masters in Vocational Pedagogy Program

Rec'd. 23<sup>rd</sup> / 06 / 2016.

SS. Richard.   
for John Lugendo & Co Ltd.

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