

Review Article

Roles of Occupational Analysis towards Effective Teaching and Learning in Technical Vocational Education and Training (TVET) Institutions

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Abstract: In order to achieve efficient and effective teaching in Technical Vocational Education and Training (TVET) institutions it is essential to give due consideration to the process of Occupational Analysis. The paper discussed the concept of TVET and occupational analysis which is the act of coming up with complete lists of what an individual should perform in a given job. It also discussed the concepts of job, occupation, trade, skill, technical information and course content which are essential in the process of occupational analysis. The paper states the roles of occupational analysis and what all the stakeholders should see to it that are included in the process. The methodology adopted for the study was survey of literature. And finally conclusion was drawn for the study.

Keywords: Role, TVET, Occupational Analysis, Teaching and Learning.

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INTRODUCTION

Technical Vocational Education and Training (TVET) equips individual with relevant skills and expertise for the labor market. (TVET) is an education, training and learning activity which provides knowledge, skills and attitude relevant for employment. TVET is describes as all kinds of formal, non-formal and informal training and learning which may occur in school, training centers or in the workshops. According to United Nation Educational, Scientific and Cultural Organization (UNESCO, 2006), TVET is used as a comprehensive term referring to these aspects of educational processes involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupational skills in various sector of economic and social life. TVET involve aspect of learning and preparation for responsible citizenship. Many institutions are involving in offering TVET courses. However, these institutions are Universities, Polytechnics, Colleges of Education (Technical) and Technical Colleges.

To achieve effective teaching and learning in TVET institutions the teacher is expected to have knowledge in the analysis of various occupations and

course constructions. According to Ede, E. O. (2001), occupational analysis is a process which deals with the analysis of jobs and trades in an occupational course to determine the skills and related technical information necessary in order to determine the content of a course of study. Occupational analysis can be seen as the act of coming up with complete lists of what an individual should perform in a given job while the concept analysis can be defined as the process of resolving or breaking up any problem or situation with its components, elements or parts. It is a procedure of breaking down a trade or occupation to determine the teachable contents in terms of operating tools, processes and technical information to be organized into a course of study and arranged in a sequence of difficulty. It is a scientific and systematic method which produces consistently good results with a reasonable effort. Any occupation is based on information (facts, concepts, ideas) which individual must know as well as the skills (operations, procedures, techniques) they must be able to perform with an acceptable degree of proficiency. The identification and organization of these skills and knowledge elements in such a way that they can be taught progressively is known as analysis. Ranka J, (2021) opined that analysis is an analysis of how well a person performs steps of occupation, the time taken and

level of mastery demonstrated. The act of analysis is actually a technique of making an inventory of all learning activities that are associated with a specific instructional area. However, to make efficient and effective occupational analysis and course construction a teacher should have clear knowledge of such concepts as job, occupation, trade, skill, technical information and course content.

In TVET the concept job refers to an assignment or work piece performed by a student in order to develop skills or tryout the application of principle. According to Meriam Webster Dictionary, (2021) an occupation implies work in which one engages regularly especially as a result of training. While, National Academy of Science (NAS), (2021) defined job as a set of tasks and duties executed, or meant to be executed, by one person. In this context, it is a unit of trade or occupation consisting of two or more operations. While in the opinion of Osuala EC (2004), job is specifically assigned and developed skills for an occupation. In other word, an occupation is what one engages his greatest part of time and energy especially as a means of earning a living. When there are much branches of occupation in a certain occupation, there is said to be occupation cluster in such occupation. For example, in Metalwork Technology, there exists trades/ occupations like fitting, machining, casting, welding, forging and so on. An occupation is also known as trade or profession. According to Ede [2] occupation is a trade, a business, a profession, an activity or a career through which one earn a living.

A trade is an occupation or way of making a living especially a hand craft. According Bollinger and Weaven in Ede, E. O. (2001), a trade is an industrial occupation requiring a high degree of manipulative skill and technical knowledge, usually encompassing a wide range of related activities, which are secured through a combination of job instruction, trade instruction, and work experience. National Extension Water Outreach Education (NEWOE) (2021) states that, skills refer to a wide range of cognitive (mental), physical and emotional skills including science processes, critical thinking, problem solving, decision making, communication, research, mathematical, psychomotor and interpersonal relations. Examples of skill are dexterity in handling tools, expertness in the use of tools and machines and that of production of an object with speed and accuracy.

Technical information means materials which help student form correct judgment and make proper decisions in performing jobs or operations. It is concern with specifications of materials, fabrication procedures, tools and machines. Good examples of technical information in some technical education subjects are: types and sizes of sheet metal, solders and fluxes, types of soldering iron, types of manufactured board,

generation and distribution of electricity, concrete and concreting. A list or outline of areas of information and skills included in a course of study is known as course content. A course of study is the organization and arrangement of the teachable material or subject matter obtained through the trade analysis so that teaching job will be well done in the shortest possible time, with the least amount of confusion and the least amount of student effort. It is a document written by the teacher for specific course to explain the philosophy, the aims, content, methods and plans for evaluation.

The process of occupational analysis is an avenue to assist course graduates to function effectively more especially on graduation. It is required that they reflect the present and future needs of the occupational area and provide graduates with principles and problem solving procedures which will allow them to participate in the changing occurring in their occupational area in the work world. Dippo D. (2021), opined that occupational analysis can be used to help redefine the aims and purposes of work education in such a way to provide students with the kinds of really useful knowledge that will enable them to participate more fully in the social and economic changes which characterize the temporary work world. Therefore, the roles of occupational analysis towards effective teaching in TVET will not be over emphasis. And this is clear putting into consideration the caliber to TVET graduates expected to be produced. Hence, the study is aimed at portraying the roles of occupational analysis, method of identification, selection and arrangement of related information and analysis of operations and related information in teaching of TVET courses.

ROLES OF OCCUPATIONAL ANALYSIS

Occupational Analysis plays a vital role in the training of TVET students. The process gives TVET teacher the training to produce exhaustive listings of what a person should do in the job. It examines personal characteristics, capabilities or skills that are supposed to be transferred from one situation to another. Through this process students are trains on roles, largely consisting of inter-relationships among people at work whether formally or in formally negotiated. It helps to equip students with the basic skills, personal attributes and technical required for obtaining jobs and performing them satisfactory. Therefore, Occupational Analysis is essential in teaching of TVET especially in the present era of technological and organizational changes which are being implemented to improve productivity and competitiveness at the same time having profound effects on the social relations and materials conditions of the work world Dippo D. (2021).

IDENTIFICATION, SELECTION & ARRANGEMENT OF RELATED INFORMATION

It is imperative to have a clear understanding of the concept related information before a teacher identify, select and arrange related information for

effective teaching and learning of TVET courses. The term related information is the information or knowledge that a workman should have and which must be taught by the teacher to the learner in a given occupation. The teacher should consider the characteristics of related information such as sequence and simplicity. And this should be the guiding principles in analyzing any occupation for teaching purposes. Likewise, unnecessary classifications should be avoided in this situation. For unnecessary informational details frequently result in disagreement and confusion in identification of assignment for related subject, that is, among teachers, technologists or technicians in the shop.

Related information is divided into two types, technical information and general information. Technical information is the information that the worker must know in order to form judgment in doing his work. According Ede, E. O. (2001), technical information applies to judgment that will help the worker in forming judgment whether the information is direct or indirect in its use. Technical information is to be listed separately and taught in advance of other topics. On the other hand, general information has to do with the social, economic, and indirect scientific aspects of the occupation. This is desirable and good for the worker to know, but which is not necessarily essential in the proper execution of his work. It is often called socio-economic information and is nice to know but not essential when time is limited in carrying out a project. Ede E. O. (2001), gives examples of technical information and general information in different trades under technical education as follows:

Examples of technical information

1. Machine shop trade:
 - i. The lesson on reading drawings
 - ii. Another on cutting speeds and feeds
 - iii. Calculation of the part of tapers
 - iv. Abrasives and coolants
 - v. The selection of correct data for cutting metric thread in lathe machine
 - vi. Places to loose and tight so as to set the compound slide at 60° in cutting angle 60° in lathe machine
2. Radio service trade
 - i. Radio symbols and schematics
 - ii. Common oscillator troubles
 - iii. A-C power supply
 - iv. Hork antenna troubles
 - v. D-C power supply battery
 - vi. Electric circuits
 - vii. Types of amplifiers
 - viii. Types of Oscillators
 - ix. Color code for resistors
 - x. Color code for capacitors
3. Building construction trade
 - i. Types of mould for block moulding

- ii. Measuring tools/instruments
- iii. Meaning and types of foundation
- iv. Depth of foundation trenches and type of structure
- v. Mixing and placement of concrete
- vi. Types of soil
- vii. Timbering in foundation
- viii. D.P.C. materials
- ix. Meaning and types of aggregate
- x. Site and site preparation

Examples of general information are:

1. Machine shop trade
 - i. History of drilling
 - ii. Development of lathe machines
 - iii. Shaper in the tool and die industry
 - iv. Development of milling machines
 - v. Constituents of grinding wheel.
2. Electrical Installation/ Wiring Trade:
 - i. History of electricity
 - ii. Concept of energy
 - iii. Cable manufacturing processes
 - iv. Development of wiring system
 - v. History of transformers

Relate information should be differentiated from related subjects. Related information is what the teacher teaches as the essential part of the course. While related subjects are separate courses organized by teacher such as drawing, shop mathematics, shop science and so on. Related information should not be mistaken for knowledge that is closely integrated with teaching the operation. Such knowledge is referred to as auxiliary knowledge which involves brief instruction on why a tool used in a certain way, or why a step in an operation is performed in a particular manner or safety precautions to be observed while performing the operation, and other similar information which must be taught as the operation is demonstrated. Discussion on such a subject is usually short, covering only those details necessary to give meaning to the operation being demonstrated E. O. (2001).

Related information is not incidental instructional material, but should carry the same status in a course as the operations. Having got their own entity, related information topics should be taught as separate lessons. Some of the information topics must of necessity be taught before the operations are demonstrated. When topics cannot be tied in with any definite operation, they can be taught at any convenient time during the course E. O. (2001).

Related information should never be taught along with the demonstration since as a rule, the operations being demonstrated are difficult enough for the students to learn, and introducing factual material at this stage only complicates the learning process E. O. (2001).

SELECTION OF RELATED INFORMATION TOPICS

The main criteria in the selection of information topics are the appropriateness of the material for the course and the length of time available for teaching the course. In each case, the question to be asked include is this information valuable? Does it enhance the course? Does it achieve some desirable objectives? Include only those related information topics that significantly contribute to the attainment of some definite aspect of the work. In selecting information topics, concentrate on one category of information and then go to the next. For example, make a list of all the general information, and then do the same for the technical information and so on. Employ the use of cards one card for each topic. There need not be an information topic for each operation. Some course, because of the amount of information required will have many more information topics than others. After listing the topics, analyze each to be sure it is appropriate to the topic E. O. (2001).

ARRANGEMENT OF RELATED INFORMATION TOPICS

Organize the information topics in some logical instructional order. Spread out the operation cards in their sequential teaching order. Then place the technical information cards alongside those operation cards that have a close relationship. Arrange the remaining information cards in any position which seems appropriate for effective teaching. Since the general, socio-economic, safety and occupational topics are not allied with any particular operation, their location in an instructional order is largely a matter of personal judgment. To simplify the procedure later, when the entire course of study is assembled number the information topics so as to record their position Ranka, J. (OT) (2021).

ANALYSIS OF OPERATIONS AND RELATED INFORMATION

The material which a teacher selects for a single presentation to students is referred to as a lesson. The material may deal with the teaching of a skill or an information topic. A skill lesson is one involving demonstration of an operation. An information lesson is the one dealing with teaching of related information.

To present a lesson effectively, one must outline carefully the materials to be taught. The operation to be demonstrated must be analyzed to make certain that no part of the operation is omitted and that all the steps to be presented are in logical order. The same rule applies to the information lesson; the materials must be carefully analyzed so as to include all the pertinent facts. In preparing a course of study one may wish to include a complete analysis of each operation and information topics. Many teachers prefer to identify the operations and information topics only in

the course of study, and record the analysis on separate cards. The advantage of having such material on cards is that these cards may be conveniently used as lesson plans. When prepared in this manner they can be easily pulled out of the card file and used whenever the lesson is to be presented Ranka, J. (OT) (2021).

An operation to be demonstrated properly must follow a certain sequential order. In other words, the teacher must show what is to be done step by step, each step being demonstrated in its natural order of performance. The steps are commonly referred to as performance steps. There are two types of performance steps: The doing steps, and those involving auxiliary knowledge. Auxiliary knowledge is that information which explains “why” or “how” a step is performed, or the care of tools, or a safety precaution. It is a type of information which can be presented quickly in a few words disrupting the continuity of the doing steps. The listing of the performing steps should be done in telegraphic form, that is, complete sentences are unnecessary. Only sufficient words are needed to remind the teacher of the correct order of the steps Mager, R.F. & Beach, K.M. (1967).

CONCLUSION

It is very imperative for TVET teachers to employ the process of Occupational Analysis and Course Construction to ensure efficient and effective teaching-learning takes place. The process will enable them to carry out lesson delivery at ease and also students will learn easily. This will serve to increase students’ motivation, high quality learning experiences and transfer of learning from school to work environment. Hence, it should be a duty upon all TVET institutions to ensure that all teachers conduct lessons based on the principles of Occupational Analysis and Course Construction.

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