

Strategies for Planning, Teaching and Evaluating Practical Projects in Vocational and Technology Education Programmes

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ABSTRACT

The study introduces the concept of practical project evaluation, and identifies the strategies for its planning and teaching; which deals with rudimentary preparation prior to proper presentation, method of teaching and actual presentation of practical project lesson. It also elaborates the four stages of evaluating practical project with their various indicators which includes; planning evaluation, process evaluation, product evaluation and workshop attitude evaluation. Numerical scoring performance pattern was outlined, followed by its grading system. It is concluded that the construction of practical project incorporated all the aspect of educational objectives, cognitive, affective and psychomotor, which directly indicates the application of what is learnt in the class and workshop or laboratory to solve a particular problem in society. This is done by carrying out a practical project to provide a product that will solve some problems beneficial to the community. It is therefore recommended among others that the teacher should make provision for the students to work in groups because leadership roles of certain students will stimulate others to greater efforts to maintain good standing in group.

Keywords: *Practical project, planning, teaching, proper presentation*

INTRODUCTION

A project is a plan or a problem oriented idea to be carried out in a real life situation by a learner, a class or school, under the supervision and guidance of a teacher. The aim of the project is to produce a useful item or to carry out some specific tasks. The value of practical projects in education and training are as follows (Enemali, 2010). Develop learners' ability to think logically, enhance the learners' abilities to manipulate tools, equipment and materials. Originality, creativity, dependability and responsibility are developed in the learner. Assist the learner to plan and organized their expression as they find answers to real problems. Learners learn to persevere, to respect the opinion of others and, to cooperate. Arouse the learners' interest and help them develop positive attitude to work and bring real activity to school work and learners can see the progress they are making. In order to effectively use projects in assessing the learner's performance, the teachers should consider instructional objectives and decide on the projects to be carried out by the learners; spell

out the objective of the project in clear terms. Prepare written instructions or direction for executing the projects. Break down the project into smaller operations. List the knowledge, attitude and skills (KAS) involved in each operation. Develop a checklist to be used in rating learners on each of the (KAS) as they carry out each operation. Determine the extent to which the learners are developing in the desired way. Evaluation is the appraisal of the worth or value of a thing or action and the making of appropriate decision on the bases of such appraisal. Human beings are always faced with evaluation decision. When people choose between alternative lines of action, they do so on the bases of an evaluation of data and the data to assess the effectiveness of the programme, product, or performance.

Evaluation in industrial terms refers to the process of determining and deciding how good a particular finished product is, and how well a student/learner has done his work, considering all factors that enhance the standardization of practical project. The goodness and the efficiency are anchored on the quality of the planning done. Planning is the ability to initiate in the present what is to be done in the future. In relation to project, it is the ability to plan the practical learning activities as essential duties and function of teachers irrespective of method/techniques of instructions. The process of planning practical project should begin with; Selection, Organization, Adaptation and Articulation of activities and content as the major parts of planning practical project. Ogwo and Oranu (2006) also identify some areas of consideration in planning practical project which involve: Materials, Activities and Method. This must be planned to a large measure in advance of classroom application. Vividly the plan has to be flexible in order to cope with situational and individual differences.

Teaching Practical Project

Prior to the teaching of practical project construction, the teacher must observe through planning and some preliminary preparations and guidelines.

Encourage the Desire to Learn: In preparing to teach a practical construction, the teacher has three distinct elements to consider

- i. Prepare the learners to receive instruction (set induction)
- ii. Prepare the materials,
- iii) Prepare the method.

After these preparations the teacher makes clear to the students what they could gain from the practical lesson and should ascertain the aspirations and interest of the students and ask students to state their interest so that the teaching can be more effective and efficient, the teachers preparation and focus on the objectives of practical lesson, level of the students, needs, and interest (Leighbody and Kidd, 1966).

Developing Learners/Trainees Interest: The trainees' interest is secured by how the lesson is presented and organized; in order to do this, a teacher has to do a number of things, such as proper practical lesson method delivery, timing, opportunity for mastery, practical application, constructive criticism and learning exercise (Ogwo and Oranu, 2006).

- i. ***Timing:*** Allocate to each and every step of the practical activities
- ii. ***Opportunity Master:*** By the end of the lesson the student should feel that the

time spent is worth the while considering the difficulty level of the practical activities and proper time allocation.

- iii. *Practical Application:* The teacher helps the learner to see the practical application of the new skills or ideas.
- iv. *Constructive Criticism:* The teacher should be careful in criticizing the work of students do not create an impression that student cannot achieve or improve.
- v. *Learning Exercise:* Exercise that will give students familiarity with the lesson and reduce their inertia.

Securing the learners/Trainees attention: To serve the students attention largely depends on the way the lesson is introduced. Nevertheless, there are many other things that could be done in various stages of the practical project lesson development of secure attention which include; questing, display, discussion, use of visual materials need for knowledge and personal experience.

Methods of Teaching Practical Project

Demonstration is the basic method of introducing new skills to the learner as there is no effective way to learn a skill than to practice it, so also there is no better way to teach a skill than to demonstrate it (Veine, 1970). Demonstration is any planned performance by vocational/technical teachers on an occupational skill/information, aimed at explaining the steps, facts of an operation and principles. It aims at explaining the step/facts of an operation/principles. It aims at showing how a process, procedure or experiment is to be carried out. It shows the students what to do and it is done that way practically, everything in any vocational and technology workshop, including laboratory challenges, the teachers provide effective demonstration to facilitate students understanding. Imogie (1988) classifies teachers according to teaching techniques adopted:

- i) The medicine teacher tells.
- ii) The good teacher explains.
- iii) The superior teacher demonstrates.
- iv) The great teacher inspires.

Bird (1972) observes that demonstration is one of the most effective teaching method used in technical and vocational course and it shows to students exactly what is to be done, why it is done in a certain way, how to do it, and how to apply the skill or procedure that is essential to complete a given tasks. Before the actual presentation of the lesson the instructor should plan the following:

- i. Clarify his/her mind on objectives of the practical. This will help in determining what to demonstrate and how to demonstrate it.
- ii. Plan the sequence of presenting the element of demonstration.
- iii. All machines, tools, and working materials should be kept handy and properly arranged before the demonstration. Rehearse or run through the entire demonstration procedure to ensure that it is technically corrected and that all machines and tools are in good working condition.

Presentation of Practical Project Lesson: During presentation the teacher should:

- 1. Be relaxed and confident and put up a friendly manner.

2. Ensure physical comfort of the students/trainees which include: (i) seating/standing arrangement, (ii) illumination and (iii) free from distraction.
3. Ensure that every member of the class group sees and hears clearly around the students should be arranged according to their height around the stationary machines and equipment.
4. Explain to the students before the commencement of the demonstration what he/she is about to demonstrate.
5. Follow his/her lesson plan step by step and perform the demonstration gradually.
6. Use the correct method of performing operation and should avoid unnecessary changing of method.
7. Give essential technical information along with demonstration.
8. Ensure that the demonstration is not too long but between 10 - 25 minutes.
9. Ask questions for each major step of demonstration.
10. Adopt safety procedure along other technical information during demonstration.
11. Give room for students to apply what has been taught (the follow up), give assignment and supervise them.
12. Give room for the students to ask questions on areas they have difficulties for further clarification and understanding.

Evaluation of Practical Project in a Workshop/Laboratory

Evaluation of practical project aims at determining and deciding how good a particular finished product is, and how well a student trainer has done his work. Odo, Adenle and Ikwor (2012) provide the four stages where the evaluation of practical project will cover, thus (1) planning evaluation, (2) process evaluation, (3) product evaluation and (4) workshop attitudes evaluation. The example of the content of each area to be evaluated and their rating are as follows but each items in the scale is to be rated on the basis of:

4	=	point for outstanding quality,
3	=	point for better than average,
2	=	point for average.
1	=	point for inferior,
0	=	point for unsatisfactory.

Decide on the appropriate number to indicate your rating by circling the number.

Grading system

140 - 160 = A, 120 - 139 = B, 80 - 119 = C, 60 - 79 = D, 40 - 59 = E, 0 - 39 = F,

Numerical Score of Performance: The following points will be useful to the examiners in rating the performance of the students in a project.

- i. Prepare the work station (workshop/laboratory) prior to the student's commencement of the practical project.
- ii. Ensure that the assessment sheet is ready carrying all possible indicators to evaluate performance in practical project.
- iii. Ensure that all materials needed for the practical project are orderly placed.
- iv. Instruct the students to study the direction carefully, ask appropriate questions to make sure they understand what they are to do.

- v. Direct students to begin the work and record the time started and later time when the job was completed, record the time they completed major phases of the performance.

Planning Evaluation

1. The details of the design	0	1	2	3	4
2. Details dimension of the working drawing	0	1	2	3	4
3. Identification of materials	0	1	2	3	4
4. Appropriate selection of materials	0	1	2	3	4
5. Identification of tools/ equipment	0	1	2	3	4
6. Appropriate selection of tools & equipment.	0	1	2	3	4
7. Relatedness of tools, materials and operations	0	1	2	3	4
8. Specification of operation	0	1	2	3	4
9. Accuracy of part list	0	1	2	3	4
10. Preparation of work piece/component	0	1	2	3	4

Total Points

Process Evaluation

1. Observing safety precautions	0	1	2	3	4
2. Accuracy and speed of the work	0	1	2	3	4
3. Logical arrangement in carrying out of operations	0	1	2	3	4
4. Appropriate use of tools and equipment	0	1	2	3	4
5. Appropriate use of materials	0	1	2	3	4
6. Skills exhibited in carrying out operation	0	1	2	3	4
7. Ability to minimize waste of materials	0	1	2	3	4
8. Students independent of teacher during the practical project	0	1	2	3	4
9. Extent to which joints were properly made	0	1	2	3	4
10. Extent to which time is utilize	0	1	2	3	4

Total Points

Product Evaluation

1. Quality of the finished product	0	1	2	3	4
2. Appearance in relations to the desired shape	0	1	2	3	4
3. Relationship of the design in relation to the finished product.	0	1	2	3	4
4. Appropriate edge formation/ Strongness of joints	0	1	2	3	4
5. Surface smoothness/roughness	0	1	2	3	4
6. Usability of the finished project	0	1	2	3	4
7. Ease of operation of the finished project	0	1	2	3	4
8. Ease of maintenance of the finished project	0	1	2	3	4
9. Portability and transferability of the finished project	0	1	2	3	4
10. Safety of the users of the finished project	0	1	2	3	4

Total Points

Workshop attitude evaluation

1. Interest/readiness	0	1	2	3	4
2. Cooperation	0	1	2	3	4
3. Confidence	0	1	2	3	4
4. Self-control	0	1	2	3	4
5. Patience/Endurance	0	1	2	3	4
6. Care of tools and equipment	0	1	2	3	4
7. Abiding by the workshop rules and regulation	0	1	2	3	4
8. Neatness	0	1	2	3	4
9. Creativity	0	1	2	3	4
10. Punctuality	0	1	2	3	4

Total Points

CONCLUSION AND RECOMMENDATIONS

The construction of practical project incorporated all the aspect of educational objectives, cognitive, affective and psychomotor, which directly indicates the application of what is learnt in the class and workshop or laboratory to solve a particular problem in society. This is done by carrying out a practical project to provide a product that will solve some problems beneficial to the community. Thus its evaluation project must be wide enough to include so many indicators, so that, the project will be a source of happiness, contentment, socio-economic development, sustenance and comfortable living for the providers (constructors/students) the users and the modern society in general. The following recommendations are suggested for the prospective technical/vocational education teachers/trainer in practical project evaluation.

- i. In assigning the practical project to students consider what they can perform with a good chance of success by using short term goal to the objective. Success boost students ego.
- ii. Planning of work by the students should attain satisfactory stages of completion within a reasonably short time.
- iii. Provide means of checking and comparing result with accepted standard of workmanship.
- iv. Make provision for the students to work in groups because leadership roles of certain students will stimulate others to greater efforts to maintain good standing in group.
- v. Permit individuals to vary their practical projects according to interest, provided that critical elements of instructions are not neglected.
- vi. Reward students judiciously for correct performance by praising or giving special jobs to them.
- vii. Students practical projects should evolve from the lessons presented to them.

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