

Needs analysis in technology education programme: purposes and procedures in curriculum development in nigeria

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Abstract

The paper focus on needs analysis in technology education: Purposes and procedures in curriculum development in Nigeria. It examines the term technology education in Nigeria, needs analysis in curriculum development, the purposes of needs analysis in curriculum development, procedures for conducting needs analysis and needs analysis in technology education. The paper revealed that, needs analysis in technology education is faced with ethical challenge of not being fair and ethical about needs analysis approach used in data collection, the temptation of being partial by researchers and curriculum developers have ignored the use of systematic and comprehensive needs analysis and rely on their own recollections of the occupational area or recollections of panel of experts. The paper concluded that, needs analysis in technology education in Nigeria is faced with challenges both from researchers and curriculum developers ends. Therefore, the paper recommended among others that, researchers in technology education should be fair and ethical about needs analysis approach in data collection and curriculum developers in technology education should adhere to the use of systematic and comprehensive needs analysis in curriculum development processes.

Key Words: Needs, Analysis, Technology, Education, Purposes & Procedures

1. Introduction

The rapid advancement in technological innovation is affecting every sector especially that of education and the world of work. This advancement results to extremely rapid changes over recent decades. These changes have clear implications for education sectors, in particular those of technology education. The implications reflect the coherent interrelation between technology education and world of work. For the technology education sector, the changes require adjustments in learning and teaching. These adjustments have to synchronize what is taught in technology education institutions with what is actually performed at work places. For a broader perspective, the competence needs of the world of work have to matched the needs of learners within the technology education learning processes. The matching of these needs calls for needs analysis in technology education.

2. Technology Education

Technology education is the study of technology, in which students learn about the processes and knowledge related to technology. Marc *et al.* (2016) defined technology education as a field of study that covers the human ability to shape and change the physical world to meet needs by manipulating materials and tools with techniques. It addresses the disconnect between wide usage and the lack of knowledge about technical components of technologies used and how to fix them. Blandow and Dyrenfurth (2014) noted that, technology education seeks to contribute to the learners' overall scientific and technological literacy.

Technology education is a major component of vocational education which is obtainable at various institutes of learning that includes Technical Colleges, Polytechnics, Colleges of Education and Universities. Ekpenyong (2005) noted that, this type of education is designed to prepare individual to acquire practical skill, basic and scientific knowledge and attitude required as craftsmen, technicians, technologists and sub-professional level in automobile, building, electrical, metal and wood technology trades among others. Federal Republic of Nigeria (2004) revealed that, the goals of technology education shall be to:

1. Provide the trained manpower particularly at craft, advanced and technical levels
2. Provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development.
3. Give the necessary training and impart skills to individuals who shall be self-reliant.

In pursuance of the above goals, the main features of the curricular activities of technology education institutions shall be developed to meet the occupational needs of the chosen trade. The first important stage

in the development of technology education curriculum, is conducting needs analysis.

3. Needs Analysis

Needs Analysis is a formal, systematic process of identifying and evaluating training that should be done or specific needs of an individual or group of individuals. Needs are often referred to as 'gaps' or the difference between what is currently done and what should be performed. Altschuld and David (2010) defined needs analysis as a systematic process of determining and addressing needs or "gaps" between current conditions and desired conditions or "wants". The discrepancy between the current condition and wanted condition must be measured to appropriately identify needs. The needs in technology education can be a desire to: improve, correct a deficiency or develop a curriculum.

Needs analysis in curriculum development is a process of gathering appropriate and sufficient data to be used in developing an effective product that will address the learners' needs and wants. According to Triner *et al.* (2016), needs analysis in curriculum development should be viewed as a process by which meeting learners' needs leads to improvement of learners' learning. Rossi *et al.* (2014) further described needs analysis in curriculum development as the procedure used to collect information about the learners' needs. Therefore, there is need for curriculum developers to gather as much information as possible toward the learners' needs. Needs analysis involve collecting information that will serve as the basis for developing a curriculum that will meet the needs of a particular group of students (Sharma *et al.*, 2010).

Furthermore, needs analysis as the first step in curriculum development and believes it provides validity and relevancy for all subsequent curriculum development activities. Kaufman (2012) noted that, the information collected for needs analysis should include the desired outcomes or expectations of a high quality program, the role of assessment, the current status of student achievement and actual program content. The information should also consider the concerns and attitudes of teachers, administrators, parents and also the learners. Mager and Pipe (2007), postulated that, data collected for needs analysis should include samples of assessments, lessons from teachers, assignments, scores on state standardized tests, textbooks currently used, student perception and feedback from parents. As for the feedback, learners should receive helpful feedback which will allow them to improve the quality of occupational skills in the world of work.

4. The Purposes of Needs Analysis in Curriculum Development

Needs analysis is a part of curriculum development processes, often used for improvement of individuals and education system. It can be an effective tool to clarify problems and identify appropriate interventions or solutions in education. Watkins (2012) revealed that, basically, needs analysis in curriculum development may be used for a number of different purposes, such as to:

1. Find out what technological skills a learner needs in order to perform a particular role in the world of work
2. Help determine if an existing course adequately addresses the needs of potential students
3. Determine which students from a group are most in need of training
4. Identify a change of direction that people in a reference group feel is important
5. Identify a gap between what students are able to do and what they need to be able to do
6. Collect information about a particular problem learners are experiencing.

5. Needs Analysis in Technology Education in Nigeria

For the last decade, technology education institutions in Nigeria have been subjected to substantial criticism for the lack of sufficient skills and knowledge in their graduates required by world of work. Employers are not satisfied with the quality of the technology education graduates and are not willing to hire them and technology education graduates complain about the inadequacy of training in schools and the difficulty of finding a satisfying job in their specialization (Ekpenyong, 2005). This gloomy situation largely results from technology education inability to adapt to new developments and rapid changes in industry.

Needs analysis in technology education is being conducted by several individual researchers to ascertain learners' and occupational needs. The needs analysis process in technology education is characterized with lot of ethical challenges. When conducting needs analysis, it is critical for researchers to follow ethical guidelines because ethical challenges are always going to be faced during the process. Rusnacks (2015) revealed that, one main ethical challenge in conducting needs analysis among researchers in technology education is not being fair and ethical about approaches and instruments used in data collection. Collection of facts and not emotional charged statements, personal opinions or any other forms of judgements that are based on acceptable evidence should be the ethics of needs analysis. Nevertheless, Altschuld and David

(2010) revealed that, another ethical challenge in conducting needs analysis is the temptation to remain partial or to be influenced by private or social issues that are irrelevant to the needs analysis process.

Nevertheless, curriculum developers in technology education needs to prioritize on needs analysis in the development of competency based curriculum (Aina, 2001). Traditionally, the developers of technology education curriculum have ignored the use of systematic and comprehensive needs analysis to determine learners' needs in a specified occupational area. Benesch (2016) disclosed that, developers of technology education curriculum have tended to rely on their own recollections of the occupational area, or on the recollections of a panel of experts. The wisdom of relying on such data alone has been severely criticized, because of the possible limited experience across curriculum developers and the lack of decency skills in the occupational area of such personnel (Rayner & Hermann, 2008). It is considered that, the use of needs analysis is necessary to ensure that an occupational course is relevant: that it assists course graduates to function competently in the occupational area immediately upon graduation and into the foreseeable future. Such relevancy is especially important for beginning technology education graduates who must be able to perform competently as soon as they commence practice in the world of work.

However, needs analysis in technology education curriculum development process require procedure or combination of procedures. Hermann (2007) argued that, different procedures in collecting subsets of data from reliable sources depending on the particular needs of the investigation is appropriate. Hermann further recommended that, the procedure of needs analysis in technology education be conceptualized as consisting of three phases:

1. Phase 1. Describing the nature of the learner and scope of the occupational area;
2. Phase 2. Developing a list of occupational competencies (indicating what the learner has to be able to do in the occupational area, now and/or in the foreseeable future);
3. Phase 3. For each competency, collecting relevant data (such as importance, and extent of performance; in order, for example, to assist in prioritizing competencies with respect to their inclusion in the course).

6. Procedures for Conducting Needs Analysis

There are a variety of procedures can be used for conducting needs analysis and the kind of information obtained is often dependent on the type of procedure selected. Therefore, the use of a triangular approach (collecting information from two or more source) is advisable to get very comprehensive and sufficient information (Murk & Wells, 2008). Procedures for collecting information during a needs analysis can be selected from among the following:

1. Questionnaires
2. Self-ratings
3. Interviews
4. Meetings
5. Collecting learner language samples
6. Task analysis
7. Case studies
8. Analysis of available information

Conducting a needs analysis involves choosing from among various procedures above and selecting those that are likely to give a comprehensive view of learners' needs and that represent the interests of the different stakeholders involved. Decision on choosing particular procedures should consider some factors such as collecting, organizing, analyzing and reporting the information collected. Hannum and Hansen (2009) noted that, it is important to make sure that needs analysis does not produce information overloaded. Therefore, the reason for collecting should be stated clearly to ensure that only information that will actually be used is collected. Altschuld and David (2010) revealed the step by step procedures that can be followed in investigating the learners' needs that include the following:

1. Literature survey
2. Analysis of a wide range of survey questionnaires
3. Contact with others who had conducted similar surveys
4. Interviews with teachers to determine goals
5. Identification of participating departments
6. Presentation of project proposal to participating departments and identification of contact person in each department

7. Development of a pilot student and staff questionnaire
8. Review of the questionnaires by colleagues
9. Piloting of the questionnaires
10. Selection of staff and students' subjects
11. Developing a schedule for collecting data
12. Administration of questionnaires
13. Follow-up interviews with selected participants
14. Tabulation of responses
15. Analysis of responses
16. Writing up of report and recommendations

7. Conclusions

Needs analysis is a part of curriculum development processes in technology education, often used for improvement of individuals and education system. Based on the findings of this paper, it is concluded that, needs analysis in technology education in Nigeria is faced with ethical challenges in data collection process by researchers, curriculum developers relying on their recollections of the occupational area or recollections of panel of experts and lack the use of systematic and comprehensive needs analysis processes.

8. Recommendations

Based on the findings from this study, the following recommendations were made:

1. Researchers in technology education should be fair and ethical about needs analysis approach in data collection
2. Researchers in technology education should always collect data on needs analysis by using recognized rules of evidence, tools and techniques which are endorsed and accepted.
3. Curriculum developers in technology education should adhere to the use of systematic and comprehensive needs analysis in curriculum development processes
4. Curriculum developers in technology education should not only rely on their own recollections of the occupational area or recollections of a panel of experts in curriculum development process.

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