### COMPETENCY IMPROVEMENT NEEDS OF TECHNOLOGY TEACHERS IN THE IMPLEMENTATION OF BASIC TECHNOLOGY

**ABSTRACT**

The study was carried out to determine competency improvement needs of technology teachers in the implementation of basic technology in Kogi State. Five research questions guided the study while five null hypotheses were formulated and tested at 0.05 level of significance. The study adopted survey research design. The population for the study was 344 teachers and supervisors of basic technology. There was no sampling because of the manageable size of the population. The instrument used for data collection was structured questionnaire. Three experts validated the instrument. Cronbach alpha reliability method was used to determine the internal consistency of the instrument in which 0.82 and 0.77 reliability coefficients were obtained for the two set of instruments. Weighted Mean and Improvement Needed Index (INI) were employed to analyze data for answering research questions while t-test was used to test the null hypotheses at 0.05 level of significance. The study found that teachers of introductory technology needed improvement in 15 competencies on instructional planning for the implementation of basic technology, in teaching 50 out of fifty four contents of basic technology curriculum to students and classroom and laboratory management for the implementation of basic technology. Teachers of introductory technology needed improvement in applying varieties of teaching methods and techniques for the implementation of basic technology. Teachers of introductory technology also needed improvement in evaluating the learning outcome in basic technology. The hypothesis tested revealed that there was no significant difference in the mean responses of teachers and supervisors of technology on the competencies improvement needs in planning instruction for the implementation of basic technology, in teaching the contents of basic technology curriculum to students in junior secondary schools, classroom/laboratory management for the implementation of basic technology, in using teaching methods and techniques for the implementation of basic technology and evaluating the learning outcomes in basic technology. It was recommended that workshop and seminars should be organized for the teachers of introductory technology in order to build their capacity for the implementation of the basic technology in junior secondary schools in Kogi State. It was also recommended that teachers of technology should be retrained based on areas of needs identified in the study.

**CHAPTER ONE**

**INTRODUCTION**

**1.1 Background of the Study**

A good educational system is a strong base for technological development. It equips people with knowledges and skills for designing methods and process that will enable them to make maximum use of their natural resources for the benefit of the society. The development of a nation also depends mostly on the type of technology education, the process of impartation inherited or invented and the ability to train her citizens to sustain the level of such technological education development. Technology according Waziri (2005) is the use of the product of creativity, inventions and scientific research in the service of man. Miller, Bakare and Ikatule (2010) described technology as the process by which humans modify nature to meet their needs and wants.

In years back, the teaching of technology education has not been made a major focus at the lower level of Nigerian educational system most especially at secondary school level. To address the lapses, the Federal Ministry of Education brought about the former 6-3-3-4 system that introduced the teaching of introductory technology as a subject in junior secondary schools in Nigeria. Ajeyalemi (1990) stated that what is now technology education was formerly restricted to technical education which in essence meant skills training in crafts and in certain trades and can be used interchangeably. It shows that vocational technical education can be found or was formerly taught in technical colleges.

Due to the overwhelming desires of the world for technological development, the Nigerian government joined the force for introduction of the teaching of technology in Nigerian secondary school education system (Federal Government of Nigeria, 2004). The new system is called universal basic education (UBE/JSS), 9-3-4 year’s system of education. Basic technology therefore is one of the essential pre-vocational and integrated subjects that offered by students in junior secondary schools. It exposes students to basic ideas and concepts of technology and skill development in the various components that make up the subject (Miller, Bakare and Ikatule, 2010).

Basic technology is a foundation subject on which future technological development of students are built for those interested in vocational technical courses or engineering in higher institutions. According to the Report of Federal Ministry of Education (2007), basic technology is a compulsory subject in the 9 year basic education programme. Its purpose according to the report is to contribute to the achievement of the national education goals by inculcation of technology literacy, exposure of students to the world of work to match their talents and interests for wise vocational choice and inculcation of positive attitudes towards work as a source of human identity, livelihood and power. Basic technology gives opportunities to students to use tools and machines used in the industries. This helps to develop good attitudes towards technology and the industry. The study of basic technology helps to reduce ignorance about technology. The teaching of basic technology according to Report of Nigerian Educational Research and Development Council (NERDC) (2007) became necessary due to technological development and increased national policy orientation towards vocational education development. The desired development in the Nigerian vocational education system can only be achieved through effective implementation of basic technology in secondary school level.

Implementation is a process of making something work. According to Patrica (2002), implementation is the carrying out, or the practice of a plan for doing something. It is the action that must have preliminary thinking in order for something to happen. Olaitan (2003) described implementation to be a process, technique or means of extending the content of what is planned for the learner. In this study, implementation means the process of carrying out series of planned activities towards achieving the stated objectives of basic technology at secondary school level. In Nigerian Secondary School education system, teachers play major roles in the implementation of subjects such as technology.

Introductory technology is a skill-oriented and pragmatic field of study which aims at equipping the individuals with necessary technical skills. Uwameiye and Adiwa-Ogiegbaen (2006) described introductory technology which as a core subject among the pre-vocational subjects in junior secondary school syllabus that involves the academic practical study of materials and sources of energy with the ultimate intention of applying knowledge from the study to provide a comfortable environment for man. Technology comprises topics woodwork, auto-mechanic, building technology, electrical, electronic and technical drawing. Basic skills and knowledge in these areas are taught by teachers

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of Introductory technology. Uwameiye (1993) reported that through technology, students are helped to explore the various areas of technology towards making intelligent career choice.

Unachukwu (1990) described a teacher as person who attempts to help someone acquire or change some knowledge, skills, attitude, idea or appreciation. According to Ede and Olaitan (2009) a teacher is a person who imparts knowledge, skills and attitude to someone in a school. Wikipedia (2010) said that teacher provides schooling for others. A technical teacher according to Miller, Bakare and Ikatule (2010) is an individual who is trained in pedagogy and technical area of a particular subject to impart knowledge, skill and attitudes to students in an institution. Teachers of technology in this study are individuals who have been trained professionally in the art of teaching technology curriculum to students in junior secondary schools. Neagly and Evans in Offorma (2002) described curriculum as all the planned experiences provided by the school to assist the learners in attaining the designated learning outcomes. Teachers of technology are still set of individuals to implement new basic technology curriculum. For effective implementation of the basic technology curriculum in Junior Secondary Schools these teachers need to possess the required competency.

Competency in the view of Spencer and Spencer (1993) is a standardized requirement for an individual to properly perform a specific job. Krevisky and Jordan (1994) viewed competencies as ability to possess suitable and sufficient skills, knowledge and experience for carrying out a particular task. Olaitan (2003) added that competency is the knowledge, skills, attitude and judgement which one required in order to perform successfully at a specified proficiency in any given work. Pearson (2007) described competency as ability to do something well measured against a standard especially ability acquired through experience or training. To be competent means having enough knowledge and skills to do something to a satisfactory standard. In the context of this study, competence is the capacity of a teacher of technology to effectively teach the content of basic technology curriculum in Junior Secondary Schools. Competent teachers of technology are expected to posses the skills and knowledge required in the teaching of the subject matter to students; and where this is lacking, improvement of the teaching competency of the teachers is needed.

Improvement as defined by Pearson (2007) is the process of making something better than before. In the view of Robenson (2000), improvement is the development of circumstances in which something is lacking to a better standard or quality. If something improves, that thing or situation gets better (Sinclair, Fox and Bullon, 1992). The need for improvement always arises when there is a gap to fill. Need in the opinion of Hornby (2003) is a circumstance that requires something to be done. According to Chuta, (1992) need is what one requires in order to meet a target standard. When the target standard of the teachers is met, it will be to the benefit of the students through improved salable skills for employment on graduation. The implementation of basic technology in Kogi state started in 2007. The teachers of technology handle the teaching of basic technology because of their trainings as technology teachers in colleges of education.

Observation revealed that 50% of the students who sat for junior WAEC failed in basic technology in 2007, 2008, 2009, 2010 and 2011. Fifty percent of the candidates were graded below credit. This could be attributed to incompetence of teachers of introductory technology in equipping the students with knowledge, skills and attitudes that could assist them in passing their examinations. In addition, the inadequacy of required facilities in the schools also contributed to the weak implementation of basic technology in schools. Miller (2006) said that technical teachers lack effectiveness in managing technology laboratory and preventing wastage of materials. Miller further stated that these teachers have shallow knowledge and skills in the subject matter. Similarly, Ede (2001), said that technical teachers have deficiencies in planning and implementing of instruction in technology. NERDC report (2004) stated that 50% of the teachers in Nigerian school system were found unqualified to teach. Also, World Bank report (2004) on Africa, revealed that most of the teachers (teachers of technology now basic technology in Kogi State inclusive) recruited into teaching position in Nigeria do not meet the quality required for effective teaching. For proper implementation of basic technology in schools, there is need to determine the competency improvement needs of teachers of introductory technology who are the chief implementers of basic technology in secondary schools. This will reveal the competencies needed by the teachers for effective implementation of basic technology when what is needed is subtracted from their performance to get need gap.

**1.2 Statement of the Problem**

Basic technology is an integrated subject in the curriculum of Junior Secondary Schools where students are supposed to acquire basic knowledge, skills and attitudes about technologies. In order to improve the achievement of students in basic technology, teachers are expected to be competent in teaching the content areas of the basic technology curriculum. It is observed by the researcher that 50% of the students who sat for Junior WAEC failed in basic technology in 2010 and 2011. It was also observed that 50% were below credit level. The failure of students in basic technology could be attributed to incompetence of teachers of technology in teaching the contents areas of the curriculum.

The failure of these students could be tagged with assumptions made by the government for allowing teachers of technology to teach new basic technology to students since the two subjects are slightly different in objectives. Technical teachers lack effectiveness in managing introductory technology laboratory and preventing wastage of materials. The author further stated that these teachers have shallow knowledge and skills in the subject matter. Similarly, technical teachers have deficiencies in planning and implementing of instruction in introductory technology. Fifty percent of the teachers in Nigerian school system were found unqualified to teach. Also, most of the teachers (teachers of technology now basic technology in

Kogi State inclusive) recruited into teaching position in Nigeria do not meet the quality required for effective teaching. Therefore there is need to identify competency improvement needs of technology teachers to enhance the implementation of basic technology in Kogi State.

**1.3 Purpose of the Study**

The major purpose of this study was to determine the competency improvement needs of technology teachers in the implementation of basic technology in Kogi State. Specifically the study identified:

1. Competency improvement needs of teachers of technology in planning instruction for the implementation of basic technology.
2. Competency improvement needs of teachers of technology in teaching the contents of basic technology curriculum (technology, workshop safety, scales and scale drawing, information and communication technology, energy based technological appliances and gears) to students in junior secondary schools.
3. Competency improvement needs of teachers of technology in classroom management for the implementation of basic technology.
4. Competency improvement needs of teachers of technology in using teaching methods and techniques for the implementation of basic technology.
5. Competency improvement needs of teachers of technology in applying evaluation techniques for the implementation of basic technology.

**1.4 Significance of the Study**

The findings of the study will be of great benefits to teachers, students, society, the ministry of education and educational researchers. Teachers of introductory technology now basic technology will benefit from findings of the study. The findings will reveal areas where teachers need improvement in teaching basic technology to students. Therefore the competencies identified could be used to train teachers of basic technology for effective teaching. The stated objectives of basic technology will now be achievable ones.

The students of basic technology will also benefit from the study if the identified findings are used to train teachers of technology who are the chief implementers of basic technology in schools. Improvement of these teachers will now affect the learning outcome of the students positively. The students will now understand the knowledge and skills in basic technology. Proper understanding of basic technology will stimulate their interest in choosing technology as careers for success in the future.

The findings of the study will also benefit the Kogi State Ministry of Education. The findings of the study will now reveal to Ministry of Education areas of basic technology where teachers need improvement. Workshops, seminars or conferences can now be organized for these teachers in order to enrich their knowledge in basic technology and appropriate methods of teaching it.

The parents of individual students will also benefit from the findings of the study if implemented. Students trained by competent teachers become equipped with necessary skills and knowledge that would make them meaningful citizens. The students will be equipped with basic skills in basic technology.

The educational researchers will also benefit from the study. The study will provide needed information or literature to educational researchers who want to conduct similar study. The study will also serve as a guide to the researchers. It will enable them to know the procedures for conducting improvement needs study.

**1.5 Research Questions**

The following research questions guided the study:

1. What are the competency improvement needs of teachers of technology in planning instruction for the implementation of basic technology?
2. What are the competency improvement needs of teachers of technology in teaching the content of basic technology curriculum (technology, workshop safety, scales and scale drawing, information and communication technology, energy based technological appliances and gears) to students in Junior Secondary Schools?
3. What are the competency improvement needs of teachers of technology in classroom/laboratory management for the implementation of basic technology?
4. What are competency improvement needs of teachers of technology in using teaching methods and techniques for the implementation of basic technology?
5. What are the competency improvement needs of teachers of technology in using evaluation techniques for the implementation of basic technology?

**1.6 Hypotheses**

The following null hypotheses were tested at 0.05 level of significance:

**H01:** There is no significant difference in the mean responses of teachers and supervisors

of technology on the competencies improvement needs in planning instruction for the implementation of basic technology.

**H02:** There is no significant difference in the mean responses of teachers and supervisors

of technology on the competency improvement needs in teaching the contents of basic technology curriculum (technology, workshop safety, scales and scale drawing, information and communication technology, energy based technological appliances and gears) to students in junior secondary schools.

**H03:** There is no significant difference in the mean responses of teachers and supervisors

of technology on the competency improvement needs in classroom/laboratory management for the implementation of basic technology.

**H04:** There is no significant difference in the mean responses of teachers and supervisors

of technology on the competency improvement needs in using teaching methods and techniques for the implementation of basic technology.

**H05:** There is no significant difference in the mean responses of teachers and supervisors

of technology on the competency improvement needs in using evaluation techniques for the implementation of basic technology.

**1.7 Scope of the Study**

The study was carried out to determine the competency improvement needs of technology teachers in the implementation of basic technology in Kogi State. The study specifically covered competency improvement needs of teachers of technology in planning instruction, teaching the content of basic technology curriculum to students in junior secondary schools, classroom/laboratory management, using teaching methods and techniques and in applying evaluation techniques for the implementation of basic technology.

The teachers of basic technology subjects and supervisors in junior secondary school level in the study constituted the respondents from which data for the study were collected. This is because, it was the candid believe of the researcher that these two groups of respondents are suitable for providing the required data for the study.

**CHAPTER TWO**

**REVIEW OF RELATED LITERATURE**

The literature related to this study is reviewed under the following sub-headings:

* 1. **Conceptual Framework**
     + Concept of Competency
     + Introductory and basic technology in secondary schools
     + Competency improvement needs in teaching the content of basic technology curriculum to students in junior secondary schools
     + Competency improvement needs in using teaching methods and techniques
     + Competency Improvement Needs in Classroom/Laboratory Management
     + Competency improvement needs in applying evaluation techniques for the implementation of basic technology
     + Competency Improvement Need of Teachers in Effective Use of Instructional Materials

1. **Theoretical Framework**

* Need Assessment Models
* Repetitive Training Theory
* Theory of Job Training
* Theory of Experience Instructor

1. **Related Empirical Studies**
2. **Summary of Review of Related Literature**

**Concept of Competency**

Competency is a knowledge, skill, or attitude that enables one to effectively perform the activities of a given occupation or function to the standards expected in employment. It involves knowledge, skills and attitudes. International Labour Organization (ILO, 2004) described competence as the knowledge, capabilities, skills and behaviour which someone exhibits in doing his job. Competency as described by Encarta (2007), is ability to do something well, measured against a standard especially ability acquired through experience or training. Ely (1989) explained competence as essential knowledge and skills obtainable in a profession and those which the professionals in the field must possess and be able to demonstrate at optimal level of acquisition and functioning. With reference to this study, competency is an acceptable or standard demonstration of knowledge, skills and attitudes in teaching basic technology to students

**Introductory Basic Technology in Junior Secondary Schools**

Technology is the process by which humans modify nature to meet their needs and wants. Technology according Waziri (2005) is the use of the product of creativity, inventions and scientific research in the service of man. To achieve these, Government of Nigeria introduced technology into the school curriculum for children to learn. Technology is an integration of components of woodwork, metalwork, basic electronics, applied electricity, water flow technology, airflow technology, food preservatives, automobile, technical drawing, physics, rubber technology, chemistry, plastics, basic building technology, and ceramics. Technology gives opportunities to students to use tools and machines, which are used in the industrial processes. This helps to develop good attitudes towards technology and the industry. Uwameiye (1993) reported that through Introductory Technology, students are helped to explore the various areas of technology towards making intelligent career choice. The author explained further that technology does not in any way provide training for specific occupations nor aims at developing competencies. Technology which is the only core subject among the pre-vocational subjects of the Junior Secondary Schools in Nigeria, involves the academic and practical study of materials, and sources of energy with the ultimate intention of applying knowledge from the study to provide a comfortable environment for man. This study of Technology helps also to reduce ignorance about technology. The subject has three main objectives as stated by Federal Republic of Nigeria (Federal Ministry of Education, 1985):

1. to provide pre-vocational orientation for further training in technology;
2. to provide basic technological literacy for everyday living and
3. to stimulate creativity.

Introductory technology is a subject in Junior Secondary School which exposes students to basic ideas and concepts of technology and skills development in the various subject areas that make up the subject. Federal Government of Nigerian (2004) stipulated that a prevocational course (Introductory technology) be studied in Junior Secondary School that is aimed at instilling appreciation of technology, creation of awareness; acquisition of knowledge, work habits and attitude as well as orientation to basic manipulative skills. The National policy on Education (2004) expressed some concern about correcting the society’s attitude to technology as well as providing trained manpower at the sub – professional level for the technological development of the country. According to Fasikun (2005) introductory technology is expected to be a foundation on which future technological development and skills can be built either in technical colleges or secondary schools or tertiary institutions for those who will proceed to higher levels. It is a practice – oriented course where practical application of day – to – day learning is enforced for proper technological awareness and skill development (Olorunselu, 1990). The practical aspect of the course that will lead to basic manipulative skills, acquisition of work habit and attitude in hope to be taught as practical topics using equipment and tools. According to Fasikun (2005) introductory technology is taught in many secondary schools from first year to third year without any practical or demonstration lesson. He said that this ugly situation has been attributed to many reasons which range from unqualified teachers to lack of equipment. In order to achieve the objectives of National Policy on Education in the area of qualified technical teachers, the National Commission for Colleges of Education Structured a programme that is aimed at producing NCE graduates competent to teach introductory technology at Junior Secondary School level with a view of attaining the following objectives specified by the Federal University of Education Printing Division (1985);

1. To provide the youth in Junior Secondary School a pre – Vocational orientation for further training in technology,
2. To stimulate creativity

Aghenta and Abu in Fasikun (2005) observed that many introductory technology teachers are not performing well. Ojidu (2007) said that technology was structured to assist learners to develop interest in technology. The aim is that at the end of the Junior Secondary School, technological Ignorance will be reduced and solid foundation laid for students’ entrance into vocation of their Choice. This statement is in consonance with the National Policy on Education (2004) curriculum for Junior Secondary School, which states, “In order to reduce ignorance about technol ogy and to help lay a solid foundation for national development, introductory technology as a subject is to be offered in Junior Secondary School.

However, the extent to which technology succeeds in actualizing these objectives is contingent upon adequate supply of professionally qualified and competent introductory technology teachers in the secondary schools, availability of instructional materials for both teachers and students and development of favourable attitudes on the part of teachers and students (Ojidu, 2007). Introductory technology is a multi-disciplined subject that has a wide curricula offering in different areas of engineering, food science and applied technology. Concepts are carefully selected and serve as very useful introduction to technology for the nation’s children. This is with the belief that development of technology begins from the society and ends with the society, and in every technology, the overall aim is to exploit the existing scientific and other knowledge for useful ends. Introductory technology involves academic and practical study of materials, source of energy and natural phenomena with the ultimate intention of applying these to the service of humanity (Elekwa, 1983). The objectives of introductory technology in the school system according to the Comparative Education Studies and Adaptation Centre (C.E.S.A.C, 1989), are to provide prevocational orientation for further training in technology; to provide basic technological literacy for everyday living and to stimulate creativity. Technology makes the learners get familiar with the environment. The learner is oriented properly into work habits toward technology. So, as the nation

enters the 21st century and strives toward technological growth and overall national development, the strategic importance of introductory technology is recognized.

It is only when technology is understood that it can be adapted to suit local environment, that the concepts could be applied to problems of society. A technologically literate individual is more advantaged to succeed in personal and community life than one who is not (FGN, 1998). As envisioned in the National policy of Education (1998), a thorough understanding and application of introductory technology principles and concepts right from schools is capable of empowering learners to tackle problems confronted in real life situations. As Nwagbo (2000) explained the study of introductory technology enables one to become more aware of one’s changing environment, explore it better and be better adapted to it.

Ojidu (2007) said that introductory technology is expected to equip the learners with the needed skills for laying of solid foundation for life long learning. For the learners to acquire the appropriate level of literacy, numeracy, manipulative, communicative and life skills there is need to expose the child to appropriate instructional materials which will provide an effective communication channel to the learners. The introductory technology curriculum is so planned to enable students acquire the scientific and technological skills to function effectively after 3-tier system of education in the world of work if so desired and for further studies. Despite the government’s effort in terms of resource provisions the teaching and learning of introductory is in poor state (Nwoji, 2003).

Introductory technology according to Ojidu (2007) is one of the compulsory prevocational courses, which students are supposed to take at the JSS level. It is an integration of a number of subjects and has the following objectives;

* To provide pre – vocational orientation for further training to technology.
* To provide basic technological literacy in everyday living.
* To stimulate creativity.

Ibritaim (2001) pointed out that introductory technology was included in the new education system because in this era of globalization and development of information technology, emphasis is on technical education if the nation and her citizens are to benefit from the process and it also facilitates the attainment of the nation’s technological goals. It was planned to be only taught at the introductory levels; that is all the Courses incorporated in it. Teaching introductory technology is both teacher and learner focused (Fasikun, 2005). The teacher is expected to be dynamic, resourceful and conscious of the rapid developments in the field of technology. As noted by Akinyemi (1997), the bulk of the knowledge and skill that technical teachers in Nigeria are called upon to impart and motivate students to learn and apply are foreign to their traditional environment. The body of knowledge constantly changes with the development in introductory technology and societal needs.

On the learners’ side, the magnitude of the theoretical and practical information required by them to attain the expected level of competence is so high, complex and extremely new. The learners are expected to learn at his own pace, conscious of new information and environment, through unconsciously, should be able to compete with his peer to earn a desirable place. Introductory technology has characteristics of new body of knowledge and features of complex traditional discipline therefore required special treatment for successful teaching and learning. Technology is one of the new subjects brought into Nigerian educational System by the National Policy on Education (1981). It was introduced to satisfy the need to make the educational process and enterprise relevant to the individual and societal needs. Initial effort at the development of similar body of knowledge emanated from the need to enhance the ability of the student to conceptualize geometric solids and understand some basic tools and processes. It has equally been observed that understanding the subject has transfer effects on such as subjects physics, chemistry; biology, business studies and even accounting (Lux in Fasikun, 2005).

The rapid development of technology and its attendant effects on individual and the national development have expanded the frontier of the concept of introductory technology. Technology as a subject therefore can simply be described as simplified familiarization to the fundamentals of the technology. It has been seen as foundation to technology and technology education in Nigeria, that is, a means of creating technology literacy and awareness. According to Ivowi (1995), technology presented as distinct but related components of technology. Emphasis is on exposition to both theory and workshop practice with a view to acquiring knowledge and skills to a qualified degree of attainment.

Introductory technology is apparently and even actually more of workshop subject (Fasikun, 2005). In most cases some of the theoretical concepts are better taught in the workshop for effective illustration (Ivowi, 1995). Most of the instructional methods for teaching technology are not tenable for effective teaching of the subject. Therefore, some of these common methods are examined for their appropriateness. However, it should be borne in mind that the most appropriate method of instruction is that which can motivate the students and sustain their interests in the course of instructions.

In the opinion of Ademulegun (1990) technology is the science of the practical or industrial arts. He explained further that the level of a country’s technology determines her social and economic standard. Ajala (2002) also viewed technology as an integrated subject that comprises woodwork, metal work, building technology, auto mechanics, electrical and electronic, and technical drawing at basic level. Aigbomian and Momoh (1996) in their opinion said that introductory technology is an integrated subject with component parts derived from technical drawing, metalwork, electrical / electronics, plastic technology, ceramics technology, woodwork, Automobile, Building technology, Chemistry, Physics, food preservation and so on.

Introduction technology helps to develop in pupil’s aptitude for technical skills and ability to manipulate some basic tools. It also develops curiosity and creativity in pupils and in fact serves as basis for manpower development in Nigeria. It is also expected that if introductory technology is well implemented in junior secondary schools, it will help to create a new technological culture, a new scientific out look which will allow young Nigerians to participate actively in the making of history rather than just submit themselves to it. It is also one of the aims of introductory technology to lay the foundation not only for the nation’s technological take off but prepare youths for future employment by inculcating specific skills, which will enable them to render certain specialized services of economic value (Fasikun, 2005).

Introductory technology is an aspect of vocational education obtainable at junior secondary Schools in Nigeria. It was integrated with Nigerian educational system in 1982 by the Federal Government of Nigeria (Emmanuel, 1998). Introductory technology was described as one of the core courses, to be learnt at pre – vocational level of the junior Secondary School. Introductory technology has the potential to effect technological enlightenment on all the beneficiaries if the teaching and learning of the course were free from problems. Introductory technology the potential to effect technological enlightenment on all the beneficiaries if the teaching and learning of the course were free from problems. Introductory technology also prepares the youths for specific professions in the future, for example, some will go into higher institutions for further study in technological related areas. Some might even join the labour force directly where they will serve as craftsmen in industries. Nigeria as a developing nation cannot afford not to keep pace with the rest of the world in terms of rapid technological development proper implementation of introductory technology now become necessary for nation’s development. We all need food, shelter, clothing good health, transportation, telecommunication and stable power supply. All these can only be achieved if special emphasis is laid on introductory technology at junior secondary Schools.

Introductory technology according to Uwameiye and Ogiegbaen (2006) is the only core subject among the prevocational subjects of the Junior Secondary School in Nigeria, involves the academic practical study of materials, and sources of energy with the ultimate intention of applying knowledge from the study to provide a comfortable environment for man. The study of introductory technology helps to reduce ignorance about technology. Among the prevocational subjects in the junior secondary school curriculum, are practical agriculture, home economics, business studies and introductory technology.

Introductory technology gives opportunities to students to use tools and machines, which are used in the industrial process. This helps to develop good attitudes towards technology and industry. Uwameiye (1993) reported that through introductory technology, students are helped to explore the various areas of technology towards making intelligent career choice. Uwameiye and Ogiegbaen (2006) explained that introductory technology does not in any way provide training for specific occupations nor aims at developing competencies. The focus of the provocation courses such as introductory technology was to expose students at the junior secondary school level to the world of works through exploration. Such exposure will enable junior secondary school students to make intelligent consumption patterns.

Introductory technology came into Nigerian Educational System in 1982 when the system of education then was changed to 6.3.3.4 system of education. This 6-3-3-4-means six years of primary school, three years of junior secondary school, three years of senior secondary school and four years of university education. At the junior secondary school level, pre-vocational subject such as introductory technology were introduced into the curriculum while vocational subjects were introduced into senior secondary level. The subject has three main objectives as stated by Federal Republic Nigeria (Federal Ministry of Education, 1995).

Towards the realization of objectives of introductory technology in junior secondary schools, adequate teaching methods must be put in place for its teaching so that optimum achievement can be guaranteed (Uwamerye, and Ogiegbaen 2006). One of the subjects introduced by the National Policy on Education for study at the junior secondary school level is introductory technology (Jokotola, 2003). According to Ivowi in Jokotola (2003) general objectives of teaching introductory technology, are;

* To provide students with the technological literacy required for every day thing.
* To provide pre-vocational orientation for further development of employable skills and training in technology.
* To stimulate creativity.

Van Derkaa (1988) also defined the main features of introductory technology as;

* The development of broad range of skill rather than in depth study in a specialization area.
* Introductory technology is essentially practical. Hence, the teaching of the subject demands workshops tools and equipment.
* Theory is kept to a minimum and concentrates primarily on topics related to the practical work.
* Introductory technology is taught using an integrated approach that is, the various components of technology are not taught as individuals subject
* Introductory technology provides technological literacy for every day living, skills to be developed is made relevant to students’ environment.

According to Jokotola (2003) introductory technology provides a broad based

skills development approach to practice – oriented work where practical application of day needs in the service of man is emphasized. Introductory technology is not peculiar to Nigeria, it is accepted throughout the world under different names. In the USA and Canada, it is called industrial Art; in the United Kingdom, it also known as handicrafts. Some countries also called it different names like elementary technology, basic craft, basic technology education etc. UNESCO (2004) calls it general technical education (Olorunselu, 1996).

It is very clear that introductory technology consists of many components which are made up of separate topics; yet its Philosophy is that it should be taught as one – integrated subject. The purpose of this is that the skills acquired in one of its components could be easily transformed to another. Daramola (1989) stated that the Nigeria government approved the study of introductory technology at the junior secondary school level with the following objectives;

* Developing familiarity with the various form of technology available
* Developing a proper orientation and proper work habits towards technology.
* Developing appreciation for the significant roles played by the various technologies in national development.
* Acquiring knowledge of how to perform simple faculty diagnosis of basic machines available for developing technology.

The following objectives were formulated for introductory technology by UNESCO (2004) as follows;

* Introductory technology should offer young people the opportunity to learn of the world of technology and its products through exploration of materials tools, techniques and production process as a whole.
* Introductory technology should lead children to develop interest and understanding of the cultural aspect of technology.
* Introductory technology should develop certain command of valuable skills such as tool uses repair and maintenance, etc.
* Introductory technology through an experimental approach should teach children to plans and think rationally, to face problems and makes decision as to the best way of solving problem.

Introductory technology is an integrated subject offered in junior secondary one to three. It is one of the types of vocational courses. Introductory technology curriculum is designed in a way to inculcate basic skills in learners. According to Ihediwah (2007) technology education is the most effective means of empowering the citizenry to overcome poverty, limit the incidence of social vices due to joblessness and promote a culture of peace, freedom and democracy. Federal Ministry of Education (2004) expressed some concern about correcting the society’s attitude to technology as well as providing trained manpower at sub-professional level for the technological development of the country.

It stipulates that a prevocational subject introductory technology should be studied in junior secondary schools that is aimed at instilling appreciation of technology, creation of awareness, acquisition of knowledge, work habits and attitudes, as well as orientation to basic manipulative skills. This is expected to be a foundation on which future technological knowledge and skills can be built either in technical colleges or tertiary institution for those who will proceed to higher levels. The FME (2004), provides that the junior Secondary School will be both prevocational and academic, which will expose students to basic ideas and concept of technology and skill development in the various subject area that make up the course. Introductory technology, which is expected to be taught as part of general education is designed as integrated subject which is expected to be taught as part of general education is designed as integrated subject which comprise the following; basic electricity, electronics metalwork, woodwork building construction, food storage and preservation, principle of operations of domestic appliances, agriculture, plastics, ceramics rubber etc. Introductory technology, therefore, is unique because it is a skill oriented subject, which involves practical application of day to day learning for proper technological awareness and skill development (Olorunselu, 1990).

For children/ students to appreciate latest technologies in the present society, introductory technology was replaced by basic technology in secondary school curriculum. Basic technology (BT) is a newly introduced subject in the curriculum of junior secondary schools in Nigeria. It is a subject in the Junior Secondary School which exposes students to basic ideas and concepts of technology and skill development in the various subject areas that make up introductory technology. Basic technology is expected to be a foundation on which future technological development and skills can be built either in technical colleges or secondary schools or tertiary institutions for those who will proceed to higher levels. It is a practice – orient ed course where practical application of day to day learning is enforced for proper technological awareness and skill development. Basic Technology comprises of technical subjects such as Applied Electricity, Auto-mechanics, Building Construction, Technical Drawing, Electronics, Metal Work and Woodwork.

Miller, Bakare and Ikatule (2010) described basic technology as one of the essential pre-vocational and integrated subjects that offered by students in junior secondary schools; It exposes students to basic ideas and concepts of technology and skill development in the various components that make up the subject. It is also a foundation subject on which future technological development of students are built for those interested in advanced technology (Miller, Bakare and Ikatule, 2010).

According to the Report of Federal Ministry of Education (2007), basic technology is a compulsory subject in the 9 – basic education programmes. Its purpose according to the report is to contribute to the achievement of the national education goals by inculcation of technology literacy, exposure of students to the world of work to match their talents and interests for wise vocational choice and inculcation of positive attitudes towards work as a source of human identity, livelihood and power. Basic technology according to Report of Nigerian Educational Research and Development Council (NERDC) (2007) became necessary due to technological development and national policy orientation to the teaching of technology as an integral part of world globalization trends in education. Therefore most of the introductory technology teachers in any particular part of the country should receive a training that would enable them to utilize effectively the local materials available in their areas, to train their students. This would enable the teachers as managers of skill learning to effectively relate learning to the local environment with its resources. Also, towards the realization of these objectives of basic Technology, adequate teaching methods must be put in place for its teaching so that optimum achievement can be guaranteed.

**Competency in teaching the contents of Basic Technology Curriculum in junior secondary schools**

Effective teaching of introductory/ basic technology require competencies.

Competencies based on the subject matter are the first quality every teacher of introductory/ basic technology must possess. No one can teach what he/she does not know. Gbamaga (2002) stated that a teacher must know the subject he is going to impact to the learners and that without a good background of the subject matter the students will lose confidence in the teacher and the teacher may soon lose his or her job if the employer gets to know that he actually has nothing to offer. One good way a teacher can maintain a sense of scholarship is by reading continuously in addition to whatever they may have graduated with and also to keep abreast of research and new publications in his or her specialized field. Olaitan (2003) also stated that subject matters may be defined generally to mean a broad field of study made up of array of knowledge, skill and attitudes which an individual must acquire to become professionally competent contributors to the growth and development of his immediate family, community, state and nation. The world is turning into a global village where students are liable to be exposed to all sorts of new knowledge in their subject areas such as new technological developments, which make it very crucial for the teachers to be competent in the subject matter. If the teacher lacks the practical knowledge or skills, it will be difficult to impart necessary skills to the students and as such no maximum result will be obtained in the training. Teachers of introductory technology now basic technology must be grounded in all the contents of basic technology to be taught for effective assimilation to take place.

Many teachers enter the field with a moral purpose, the ability of teachers to serve as change agents relies on four core capacities Personal, vision, inquiring, mastery and collaboration. Fullan (1993 argued that those capacities are not developed individually but must be nurtured and consciously developed in a professional setting. Professional development programmes can serve as a space to purposefully develop these alignments of school reform and professional development. Little (1993) discussed streams of reforms, two of her streams lend relevance in considering of how teacher training programs might help teachers of basic technology develop the capacities of change agents. First Little (1993) described models of professional development that focus on developing extensive subject matter, knowledge pedagogy that depart from test-book centered teaching and instructional design which engages students in learning. This type focuses on building mastery of basic technology knowledge and developing of pedagogical content knowledge (Shulman, 2000). The second stream of professional knowledge of pedagogy that departs from text-book centered on teaching. The second stream of professional development experiences centers on problems of equity and aims to assist teachers to identify and alter classroom practices that contributes to failure and that undermines equal opportunities to learn (Shulman, 2000).

It is the responsibilities of higher institutions to produce competent teachers in basic technology for effective teaching in secondary schools. Some of the difficulties encountered by teacher in the teaching of basic technology in secondary schools, he stated that teachers try to teach as much in a lesson and failing to provide enough time, teaching facilities etc in the lesson which makes the learning and understanding of certain principles being taught difficult. According to Federal Ministry of Education (FME) (2002), Nigeria is in very short supply of professional textbooks, training manual and instructional media. The scarcity of professional textbooks and training manuals is a national threat to the technological development of the nation if professional text book, training manual and instructional media are not available for teachers and students to work with. It is essential for teachers of basic technology to be competent in both theory and practical skills. Olaitan, Nwachukwu, Igbo, Onyemachi, Ekong (1999) stated that the teachers should teach knowledge before skills. They further reported that "for effective learning to occur the learners should have good command of this information before practicing based on the knowledge of the subject matter and knowledge of how to teach subject would still not enable a teacher to be of maximum value in his profession. A good teacher of basic technology must have an in-depth knowledge of other subjects of the curriculum which is of social and economic aspect of education or background that broadens ones knowledge and outlook thereby attaining the goals of educational system. Gbamaja (2002) also stated that having mastered the subject matter very well the teacher must possess certain qualities which are largely physical, psychological, emotional and intellectual competence in order to be effective. Some of the qualities include:

1. Good personality
2. Ability to understand child psychology
3. Ability to inspire learners
4. Resourcefulness, and skills to improvise
5. Ability to observe and evaluate

It is therefore necessary for teachers of basic technology to be equipped with knowledge of the subject and skills for effective teaching. They should also have the capacity of creating a perfect teaching and learning atmosphere in the classroom.

**Competency Improvement Needs of Teachers in using Teaching Methods and Techniques**

Teachers of basic technology are also expected to be competent in applying appropriate teaching methods or techniques. Teaching methods or techniques are important in any educative process. The teacher has to employ very rich methods and select suitable ones among them .The method will not only provide students with knowledge but it also must develop skills of cooperative learning, discussion and social relations of students of the same time (Journe, 2007). In research about the perceptions of instructional materials, classroom teachers generally demonstrated little knowledge of technologies (Odabasi and Namlu, 1997). Teaching methods according to Ogwo (1996) "is a recurrent pattern of teacher behavior, applicable to various subjects matters, characteristics of more than one teachers and relevant to learning". According to them methods are described as recurrent because they are repeated over interval measured in minutes or weeks that teaching can also been said to be instrumental process such as pattern teacher behavior, for example lecturing, discussion and so on.

Delivery systems for curriculum such as film, programmed instruction, printed matter etc are also organizational structures for promoting learning. The instructional processes promoted student learning of different kind of various subject matters. Ericson and Andrews (1976) argued that there exist a vast literature on teaching techniques or methods conceived as classified by different authors, some teaching methods ends up in instruction in instructing in education.

Pedagogy requires that teachers avoid confining to one teaching methods, teachers are advised to use various methods. Among the various difficulties experienced by teachers of basic technology is not being able to use adequate teaching methods. Basic elements of several types of teaching methods may appropriately be combined for best result depending on the age of the students and the type of subjects matter being taught. This is where teachers select good but not all can be used at the same depending on the age and level of the students. Ukeje (1991) stated that no teaching method is more efficacious than the other. But in a strict sense, some methods are more suitable for teaching certain contents that is skill, knowledge and values and so on.

A good teacher knows the principle guiding the choice of teaching method and stick to them in all situation, the teacher chooses the best suited for the subject matter considering the students ability available materials and the time her own capability. Olaitan (2003) also supported the concept that many expert will prefer the instruction separated from the curriculum and call it methodology which will include methods and techniques of teaching or various delivery system. According to Ogwo (1996), it is the teachers personal qualities compiled with his professional competencies and the age of the learners that makes for effective teaching". Any effective teacher is aware that any method of teaching employed without due consideration for the learner will not be successful. Some of the methods found effective in teaching technology based subjects are demonstration method, discussion methods, the lecture methods, project methods and laboratory methods.

Demonstration method means teaching through displaying something that is audio-visual explanation of an idea process or a product. It involves showing, doing and telling the students the point of emphasis. It is mostly used as a technique within a method of teaching and sometimes used as a method by itself. The method is most effective methods in teaching skill or performance oriented subjects either in the sciences or art, the method is executed by examples and activities by the teachers while the learner observe and listens, thus the demonstration tasks the learners sense of sight and learning. This method could be given to the entire class, small group of students or to an individual. It requires careful planning and skilful execution where the method is used as an adjunct to another method or solely used, the teacher needs to plan well, organize the materials and skillfully present the demonstration exhibition and high degree of craftsmanship. Farant (1980) also supporting the contribution, Taylor (1987) said a little practical demonstration can make an incredible increase in speed and efficiency with which information is passed on to the learners.

The lecture method which is also referred to as the talk chalk is the traditional methods of teaching which many modern educators consider as out dated but it is still prevalent in the education system in parts of Nigeria. Large amount of materials could be covered to a large class size in single period; it involves verbal presentation of ideas, concepts, generalization and facts. This method is not recommended for those in the primary school and lower secondary school level because of their level of development Gbamaja (2002) stated that the art of lecturing is a difficult one which requires that the teacher should undergo some training and continuous practice so as to achieve the required standard of performance. The teacher needs to have at his disposal to a variety of skills that do come as a result of natural endowment of which these skills must be developed except in exceptional case.

Discussion method is when two or more people interact verbally with each other. It could be considered as a technique within a method, it is a method that could be adopted deliberately in a learning situation (Gbamaja, 2002). Sometimes it occurs spontaneously as a teacher uses one method of teaching or another. It may also occur at brief intervals during informal lecture. It involves talking over subjects from various points of view and the teacher’s role is not to dispense or communicate knowledge but to act as a moderator, she does not dictate or influence the viewpoints of the student as he moderates the discussion.

Project method is learning activities selected, planned, designed and executed by learning collectively or individually clarifying factors, acquired new knowledge skills appreciation and to solve identified problems under teachers guidance and supervision. Okoro (1993) reported that “in the planning of a pr oject students may have to list the major steps in doing the project, make needed sketches, list the tools, equipments and materials required and state the procedures to be adopted in the assembly of the project. Okoro also remarked that in project methods, students are not usually told exactly what to do but are expected to participate in the planning of the intended project.

Another method is the laboratory method; the concept of laboratory work has extended from science affair to almost all other disciplines. Laboratory work is no more restricted to science alone. Laboratory method of teaching involves observation, experimentation or application by individual or small groups dealing with actual materials. This method is not restricted to a classroom called laboratory alone but it cuts across environments outside the classroom that provides practical work to give first hand experiences to the learner. Subjects like English or literature are in modern times taught in specialized laboratories equipped with tape recorders, cassettes and earphones, instead of scientific apparatus to do science experiments (Gbamaja, 2002). Teachers are therefore expected to be effective in using appropriate methods for teaching contents of basic technology. The choice of any method should however be based on stated objectives and the objectives must be stated in term of anticipated change in students behaviour that can be measured.

**Competency Improvement Needs in Classroom/Laboratory Management**

The term management is the skillful handling or use of something such as resources. It involves the act of controlling, directing, supervising and so on. The classroom teachers does all of these and more in his managerial role in the classroom. Many productive system, whatever its aim and technology, require management, it must have leadership and direction, supervision and co-ordination, constant evaluation and adjustment. Brophy (1986) also defined classroom management as the ability to establish, maintain and restore classroom as an effective environment for teaching and learning. Brophy added that it is particularly true of teachers working in urban schools where potential management problems tends to be more intense and numerous. Management depends on preparations, clarity about expectations, rules and procedures, instructions and opportunities to practice desired procedures and receive feedback, giving reminders to desired procedures at times when they are supposed to be implemented, consistent monitoring of the students and follow through with intervention when necessary.

Ericson and Andrews (2006) believed that the ability to manage and discipline is quite important because students are not in the position to take upon themselves more leadership responsibility than is delegated by the teachers nor can they be expected to take initiative in participating in class management. Ericson and Andrews are also in opinion that it is expected of the teachers to organize the classroom and laboratory that the students may receive maximum benefit from assisting in problems of laboratory routine as well as from performing individual practical work. Successful classroom and laboratory management according to them depends on some conditions, some of which are interest, understanding, careful planning by the teacher and a suitable working condition. Basic technology laboratories have expensive facilities that are very complex in nature. It requires the active involvement of the teachers in planning, directing and controlling training facilities for the purpose of learning skills. When a laboratory is clean and bright with the equipments located in their appropriate places, it will give an impressive look to facilitate instruction and effective learning. Olaitan et al (1999) stated that a business -like laboratory stimulates and attracts new interest and capable learners because the facilities and their setting are impressive and therefore the learners would like to be identified with the programme.

There are several reasons for maintaining a good laboratory and classroom management and they are outlined as follows:

1. A well arranged laboratory facilities instruction
2. An orderly laboratory fosters students learning because a comfortable environment stimulates learning.
3. A well maintained laboratory provides a safe setting in which the teacher and her students can work.
4. When students work in a well managed laboratory, they come to learn acceptable occupational work habits and procedures.

Some of the social agents in the laboratory is that the learners bringing in anxiety and antagonism from home, playground and other extra -curricular activities of the learners Olaitan et al (1999).They also reported that a well managed tools and equipments in any occupation will provide learning effectiveness but challenging and existing to all the users of the laboratory. Therefore teachers’ effectiveness in managing classrooms/laboratory determines learning outcome of the students or learners. Competencies improvement need of Teachers of basic technology must be determined in for effective management of laboratory of basic technology.

**Competency Improvement Needs in Evaluation Techniques for the Implementation of Basic Technology**

The primary and basic aim of evaluation is to find out how much knowledge students have, how much progress is being made which helps to reveal the extent to which the objectives of the programme are being achieved. Evaluation plays an important role in many facts of the school program. It contributes directly to the teaching and learning process used in classroom instruction, curriculum development, making and reporting, guidance and counseling, school administration and research. Okoro (2005) stated that evaluation is useful in the evaluation of teacher ability and effectiveness. When a teacher evaluates his students he is directly evaluating his own ability and effectiveness as a teacher. If students consistently do badly in examinations, it could be that the teacher has been incompetent and has not presented and taught his lesson in an interesting way. Norman (2001) stated that teachers’ observation and judgments of students’ behaviour are of special value in those areas where the behaviour is readily observable and the teacher special competencies to judge. It is therefore unnecessary to say that evaluation is the appraisal of the worth or value of a thing or action and making of appropriate decision on the basis of such appraisal (Okoro, 2005). The author alleged that evaluation has to do with collection of data and use of such data to assess the effectiveness or quality of performance or programme.

When people choose between alternative lines of action they do so on the basis of an evaluation of the factors involved. Brophy (1986) raised some important points about students evaluation which is often regarded as being essential for the benefit of teachers and administrations. Properly used evaluation procedures contribute to improve students’ learning through.

1. Clarifying the nature of intended learning outcome
2. Providing feedback concerning learning progress

1. Providing short term goals to work towards providing information for overcoming learning difficulties
2. For selection of future learning experiences.

It is therefore essential for teacher of basic technology to develop the necessary competence needed for the effective use of evaluation techniques. According to Houston (2001) information from carefully developed evaluation technique can also be used to evaluate and improve instruction. Okoro (2005) also stated that evaluation of students’ performance can be categorized into the following.

1. Context evaluation- which involves the assessment of course and program objectives
2. Input evaluation- which helps to evaluate the teachers ability and effectiveness.
3. Process evaluation – which involves the assessment of instructional methods and determination of the level of knowledge or skill possessed by students if done at the formative stage of the teaching and learning process
4. Product evaluation- which determines the level of knowledge or skills possessed by students if done at the summative stage of the teaching and learning process.

According to Ogwo and Oranu (2006) evaluating the input provides information on programme needs in terms of facilities, funds, equipments, materials, personnel and other resources involved in a programme. Process evaluation on the other hand is a technique which provides periodic feedback on the quality of implementation of a programme and determines if there are any defects in the implementation process. It also provides information for interpreting programme outcomes (Olaitan and Ali, 1997). Product evaluation on the other hand is an evaluation not of procedure adopted but of final product itself (Okoro, 2005). Product evaluation is not interested in the procedure adopted in answering a performance test but in the product on objective produced. Therefore for teachers to use these evaluation techniques effectively they must have the skill or competencies required to carry out these evaluation techniques.

**Competency Improvement Need of Teachers for Effective Use of Instructional Materials**

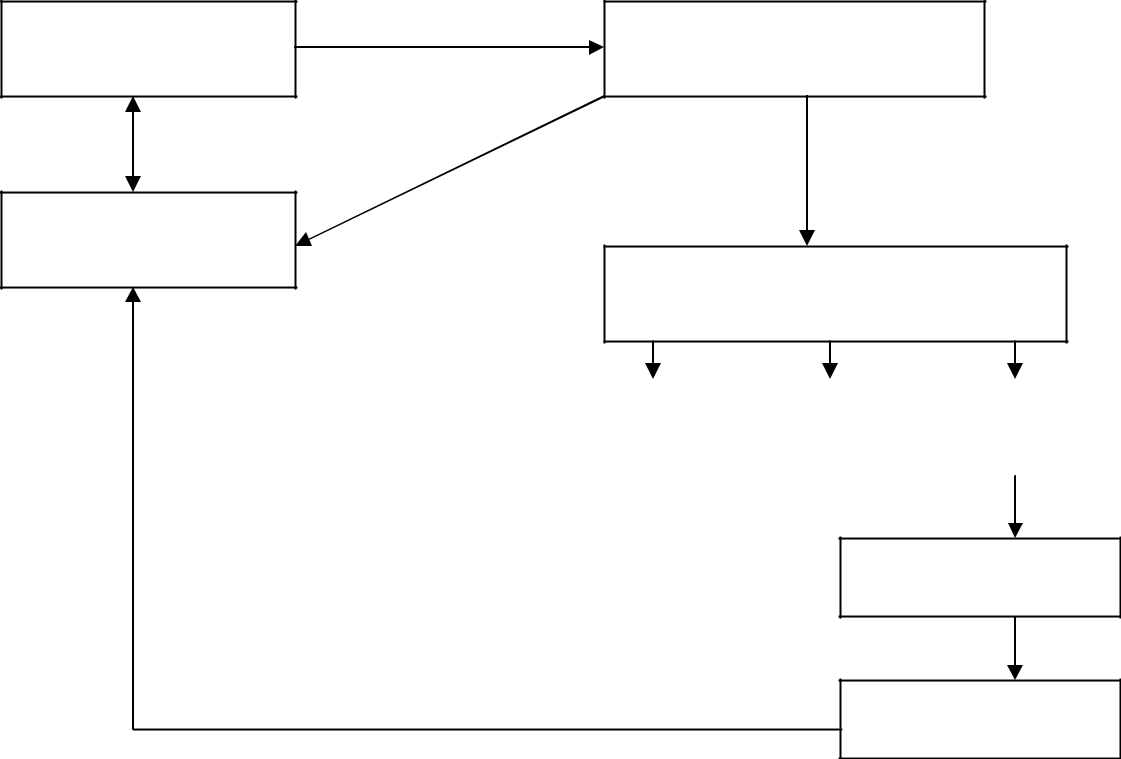
In learning process, instructional materials attract students’ attention and interest on the subject being taught and maintaining their attention alive during learning process. It enables a comprehensible and an efficient teaching to occur. The more the sensory organ of the students are addressed the more efficient and permanent learning will be. For this reason teachers have to use the instructional materials in order to address the sense of the students as much as possible. Besides, the rapid improving technology increases the instructional alternatives in the educational system. Jonassen and Reeves (1996) stated that instructional materials that are used efficiently have the potential to improve the educational system. Odabasi and Namlu (1997) in their research about the perception of instructional materials, stated that classroom teachers generally demonstrated little knowledge and skill about using computers and other devices for instructional material proves a major problems among teachers in secondary schools. It is therefore pivotal for computer studies teachers to attain and maintain an assure degree of technological competence o make instructional materials more effective, consequently it allows them to become more efficient in dealing with their daily tasks.

According to Hango (2004) instructional materials play an important role in the communication process for effective learning therefore, systematically prepared instructional materials enhance communication leading to effective teaching and learning. Instructional materials assists teachers to teach effectively and also assist the learner to grasp contents and practice easily. Similarly teaching and learning aid helps both the trainer and trainee in the process of teaching and learning (Mtunda and Safuli, 1998). However the aid or instructional material must be carefully designed, selected and skillfully used in order to bring about effective teaching and learning. However, Mills (1982) argued that talking is not teaching and neither is listening learning. For effective learning, the teacher, subject matter, know-how, nature of the learner and pedagogy form a critical interface. Teaching only takes place only when learning has occurred. The teacher performs the teaching activities with the purpose of helping learners of diverse personalities and backgrounds to assimilate planned content. Therefore the teacher has to select appropriate content and activities, synthesis the desired conduct of the learner decide on methods to use, emphasis to make, values to prefer, conditions to strive for, changes to advocate and make efforts to accomplish the purpose of education.

Instructional materials or media are carriers of information that are selected to help learners achieve their objectives, Hango (2004). These can include printer, monitor, printed matter, diskette, CD ROM ,DVD ROM, System units, or other basic technology machines. However to effectively teach basic technology, one has to develop the required skills and competence to handle these instructional materials. It is with the aid of these instructional materials that the teacher would be able to teach effectively in the classroom and also help the learners to understand what is being taught more easily. There are several types of teaching and instructional materials categorized as projected and non-projected. Hango (2004) described projected instructional materials as media format where still images are enlarged and displayed on a screen like the overhead projectors, cinema projector, opaque projector, slide projector and LCD projector. Brown (1982) added that projected instructional materials are said to be more effective especially in higher learning because they clarify and assist meanings which words cannot portray. It is also suitable for large groups but very expensive in capital layout and maintenance, it also requires that the teachers should be well trained for the development and correct use.

Non-projected instructional materials which are also called the backbone of the whole range of classroom visual aid are also very useful and effective. Teachers would have to generally appreciate their values. Some example of non-projected instructional materials are the white board display materials, printed and duplicated materials, audio aids such as radios, record player public address system, and electronic aid such as the CPU, computers. Therefore for schools to realize fully the educational potential offered by basic technology, teachers need technology training to acquire skills for use in their teaching practices. There is need also for in-service education program for the teachers which should lay emphasis on the integration of computer use in subject content areas and individual curriculum units. The training should be made open to both private and public school teachers to ensure uniform standards. In addition most teachers needs retraining in Information Technology (IT) techniques to enable them integrate it into instructional method and materials.

All in all for the effective use of instructional material a competent teacher must know what to teach, why it should be taught, how it should be taught, to whom it should be taught and when it should be taught. The schematic representation of the conceptual framework of the study is presented in the figure 1 below.



Technology

Basic Technology

Technology Teachers

Curriculum

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Teaching |  | Class/work |  | Evaluation |
| method |  | shop mgmt |  | Techniques |
|  |  |  |  |  |

Implementation

Competency

**Figure 1: Schematic representation of the conceptual framework of the study**

**Source: The Researcher**

The schematic diagram above shows the relationship between the variables in the study. Introductory technology teachers were trained to teach the students in Junior secondary schools technology subject. Due to the changing educational policy, introductory technology was changed to Basic technology which resulted to modification, simplification and addition of some topics in the curriculum content of new system of education.

The variations now demand that for introductory technology teachers to be able to implement basic technology, their competency improvement has to be ascertained in instructional planning, the use of teaching method, classroom/workshop management and evaluation techniques as contained in the curriculum content of the Basic Technology.

**Theoretical Framework of the Study**

A theory is an attempt at synthesizing and integrating empirical data for maximum clarification and unification (Osuala, 2005). Theory according to Beaucham in Olaitan (2003) is a series of related statements that are arranged so as to give functional meaning to a set or series of events. He further explained that the set of related statements may take the form of description or functional constructs, assumptions, postulations, laws and theories such as theory of instruction and management. The theoretical framework for this study is based on need assessment model.

**Need Assessment Models**

The use of need assessment models for identifying and justifying gaps in result and placing the gap in prioritized order for attention is of great importance in improving the pre service skills need of woodwork technology graduates of technical colleges. Witkin in Bello (2004) defined needs assessment as any systematic approach to setting priorities for future action. According to kaufman (1985) need assessment involve identifying and justifying gaps in results, and placing the gap in prioritized order for attention.

In relation to pre service skills needs of wood work technology graduates of technical colleges, learning is more likely to lead to change in practice when needs assessment has been conducted. This will help to identify practices in need of improvement and ensure that educational and organizational interventions were made to address these needs. Grant (2002) classified methods of needs assessment into seven main types, each of which can take many different forms in practice.

1. Gap or discrepancy analysis: this method involves comparing performance with stated intended competencies by self assessment, peer assessment, or objectives testing and planning education accordingly.
2. Reflection on action and reflection in Action: Reflection on action is an aspect of experiential learning and involves thinking back to some performance, with or without triggering (such as videotape or audiotape), and identifying what was done well and what could have been done better. The latter category indicated learning needs. Reflection in action refers to thinking about actual performance at the time that it occurs and demand some means of recording identified strengths and weaknesses at the time.
3. Self assessment by diaries journals, log books, weekly reviews: this is an extension of reflection that involves keeping a diary or other account of experiences.
4. Peer Review: This involves teachers assessing each other practice and giving feedback and perhaps advice about possible education, training or organizational strategies to improve performance.
5. Observation: In more formal settings teacher can be observed performing specific tasks that can be rated by observer. The results are discussed and skills needs are identified. The observer can be school inspectors, senior teacher or a disinterested person if the rating are sufficiently objective or overlap with the observers areas of expertise.
6. Critical incident review and significant event auditing: this method involves individual identifying and recording of event. This will enable the individuals to know where better performance are needed, analyzing the incident by its setting exactly what occurred, and the outcome and why it was ineffective
7. Practice review: A routine review of notes, charts prescribing, letters request etc. can identify skills needs, especially if the format of looking at what is satisfactory or not for improvement is followed. In addition, Grant (2002) stated that “needs” can be classified into felt needs (What people say they need) expressed needs (expressed in action) normative needs (define by experts) and comparative needs (group comparison).

There is no one model or conceptual framework for needs assessment that has been universally accepted and there is little empirical evidence of the superiority of one approach over another. Moreover existing models are so numerous and diverse that criteria for selecting an appropriate approach have been developed. Witkin in Bello (2004) has developed a guideline for the selection of an educational needs assessment approach. The following questions are still useful for evaluating needs assessment models and structuring procedures.

1. Who wants a needs assessment?
2. Why is a need assessment wanted?
3. What should be the scope of assessment?
4. On whose needs will you focus and at what level?
5. What kinds and amounts of data should be collected for your purpose?
6. What sources and methods might you use for data collection?
7. What are your constraints on data collection?
8. What needs assessment products meet your purposes, constraints and resources? Grant (2002) Stressed that need assessment might be to help curriculum planning, diagnose individual problems, assess student learning, demonstrate accountability, improve practice and safety or offer individual feedback educational intervention.

Three basic survey methods for collection of needs assessment data include questionnaires, interviews and critical incident techniques. Of these, the written questionnaires, is the most common method of collecting needs assessment data (Witkin and Attschuld, (1995) for the purpose of this study survey method was used for collecting assessment data.

**Repetitive Training Theory**

Vocational education is in its pedagogy based squarely upon habits psychology. The habits formed are not of value until they have become firmly fixed. Therefore, it is necessary in vocational education that the habit-forming experience should be repeated sufficiently to form permanent habits. Prosser and Quigley in Okorie (2001) propounded repetitive training theory which states that vocational training will be effective in proportion as the specific training experiences for forming right habits of doing and thinking are repeated to the point that these habits become fixed to the degree necessary for gainful employment.

Special workers of every kind gain by repetitive practice a degree of skill in the performance of activities repeated so often that they become automatic or semi-automatic. In the above theory, it was discovered that as teachers engages in continuous training in vocational education, their competencies in knowledge and skills consequently improve.

**Theory of Job Training**

Job training may be defined as training in an operation where the entire purpose is to develop skills and given an opportunity to apply technical knowledge. Prosser, et al (1994) also propounded the theory that effective establishment of process habits in any learner will be secured in proportion as the training is given on actual jobs and not exercise or pseudo jobs. Vocational education is oriented towards the acquisition of practical skills; therefore, training should be given on real jobs and not on pseudo jobs. A pseudo job may be defined as an actual production job which is carried on in actual ways so far as knowledge and skills are concerned, but whose product is in no way utilized and whose working conditions are not those of the occupation.

**Theory of Experienced Instructor**

Prosser, et al (1994) further propounded the third theory as ‘experience instructor’. In vocational education, the only person who is competent to instruct and train is the individual who is himself a master of his craft and acquired his equipment habits by going through the mill. This theory state that, vocational education will be effective in proportion as the instructor has had successful experience in the application of skills and knowledge to the operations and processes he undertakes to teach.

The aforementioned theory shows significant relationship with this study because repetitive training in vocational education will lead to improvement in competency as a result of the gathered or acquired experiences. Consequently, training in a particular field of specialization in vocational education is of paramount importance. Introductory technology teachers are trained in the vocational institution such as Colleges of Education (Technical) to teach the subject. These same teachers are now required to be teaching Basic Technology in the Universal Basic Education/Junior Secondary Schools (UBE/JSS) with its curriculum course content added with some topics such as information communication technology (ICT) and career prospects and opportunity in technology. Therefore, improvement in knowledge, skills and attitudes can only be enhanced through training which was the base of the theories.

**Related Empirical Studies**

Miller, Bakare and Ikatule (2010) carried out a study to determine the professional capacity building needs of teachers for effective teaching of basic technology curriculum to students in junior secondary schools in Lagos State. Three research questions guided the study. A survey research design was employed for the study. The population for the study was 550 teachers of basic technology for junior secondary schools. Random sampling technique was used to obtain 250 teachers for the study. Three sets of structured questionnaire items were developed and used to collect data from the teachers of basic technology in junior secondary schools. Cronbach alpha reliability method was adopted to determine the internal consistency of the questionnaire items; values of 0.80, 0.84 and 0.81 were obtained for the sets of questionnaire respectively. Data collected were analyzed using weighted mean and improvement needed index (INI). It was found out in the study that teachers need capacity building in all areas of instruction in the junior secondary schools basic technology curriculum content. It is therefore recommended that the findings of this study be used to organize either workshops or short duration courses for capacity building of teachers of basic technology for teaching in junior secondary schools in Lagos State.

A study was conducted by Bakare, Adelaja and Iliya (2011) on competency improvement needs of instructors in teaching electronic measurement and instrumentation to students in polytechnics in South-western Nigeria. Four research questions guided the study. The study was carried out in South-western Nigeria. The population for the study was one hundred (100 instructors) in polytechnics. A 73 competency item questionnaire was developed and used for data collection. The questionnaire had two types of scale responses of needed and performance with a four point response scales each. The questionnaire was validated by three experts. Split-half technique and Cronbach alpha method were used for the reliability which yielded a coefficient of 0.82. One hundred (100) copies of the questionnaire were administered to the respondents. All the copies of the questionnaire were retrieved and analyzed using weighted mean and Improvement Needed Index (IRI) to answer the research questions. It was found out by the study that the instructors require improvement on all the 71 competency items in electronic measurement and instrumentation. It was therefore recommended that the instructors in electronics measurement and instrumentation in polytechnics be retrained in the 71 competencies identified by this study through workshops and short duration courses by the stakeholders.

Bakare and Owodunni (2011) carried out a study to determine the performance improvement needs of lecturers in the application of computer to the teaching of electrical/ electronic courses in colleges of education in south western states, Nigeria. Three research questions guided the study. A survey research design was employed for the study. The population for the study was 120 lecturers of electrical electronic technology from colleges of education. Three sets of structured questionnaire item were developed and used to collect data from the lecturers. Cronbach alpha reliability method was adopted to determine the internal consistency of the questionnaire item; a cronbach alpha coefficient of 0.84 was obtained for the questionnaire. Data collected were analyzed using weighted mean and improvement need index (INI). It was found out by the study that lecturers need performance improvement in the application of computer to the teaching of electrical/electronic courses in colleges of education. It is therefore recommended that the findings of this study be used to organize workshops, seminars or short duration courses for the improvement of lecturers in the application of computer to the teaching of electrical/electronic courses in colleges of education in south west zone of Nigeria.

Bakare, Adelaja and Ajisegbede (2011) conducted a study on competency improvement needs of technoteachers for teaching of applied electricity to students in senior secondary schools in Lagos State. Two research questions guided the study. A survey research design was adopted for the study. The population for the study was 350 technoteachers teaching applied electricity. Stratified random sampling technique was used to obtain 70 teachers for the study. Two sets of structured questionnaire item were developed and used to collect data from the teachers of applied electricity in senior secondary schools. Cronbach alpha reliability method was adopted to determine the internal consistency of the questionnaire item; cronbach alpha coefficients of 0.81 and 0.84 were obtained for the sets of questionnaire respectively. Data collected were analyzed using weighted mean and improvement need index (INI). It was found out that techno-teachers needed improvement in all competency cluster areas of instruction. It was also found out that techno-teachers needed improvement in teaching applied electricity contents. It was therefore recommended that the findings of this study be used to organize either workshops or short duration courses for capacity building of techno teachers teaching applied electricity in Lagos State.

Olaitan, Amusa and Ellah (2009) investigated competency improvement needs of instructors for effective teaching of cocoa plantation establishment and management to students in schools of agriculture in southwestern Nigeria. Four research questions guided the study. Survey research design was adopted for the study. It was carried out in southwestern Nigeria. The population for the study was 96 instructors in schools of agriculture in Ondo and Oyo states. The sample of the study was 42 instructors purposively sampled from the Departments of Crop production in schools of agriculture from the two states. The instrument used for data collection was a 49-competency structured questionnaire which was face validated by three experts. Split-half technique and cronbach alpha reliability method were adopted to determine the internal consistency of the competency questionnaire item; a cronbach alpha coefficient of 0.76 was obtained. Fifty two copies of the instrument were administered. All the fifty two copies of the instrument were retrieved and analysed using weighted mean and improvement needed index (INI). It was found out that improvements were needed by the instructors in 45 out of 49 competencies identified in cocoa plantation establishment and management. It is therefore recommended that, the identified competencies in which improvement are needed be packaged and used for retraining the instructors in cocoa plantation establishment and management through workshops or short duration courses by the stake holders to enable them meet the training needs of students and justifiably motivate their interest in cocoa farming.

Olaitan, Alaribe and Omeh (2009) carried out a study to determine competency improvement needs of instructors in teaching soil conservation tillage practices to students in schools of Agriculture in South-Eastern Nigeria. Two research questions guided the study. The study was carried out in South-Eastern Nigeria. The population for the study was twenty-four (24). A 25 competency item questionnaire was developed and used for data collection. The questionnaire had two types of scale responses of required and performance with a four point response scale each. The questionnaire was validated by three experts. Split-half technique and Cronbach alpha method were used for the reliability which yielded a co-efficient of 0.86. Twenty four copies of the questionnaire were administered to the respondents. All the copies of the questionnaire were retrieved and analyzed using weighted mean and Improvement Required Index (IRI) to answer the research questions. It was found out by the study that the instructors require improvement in all the 25 competency items in soil conservation tillage practices. It was therefore recommended that the instructors in soil conservation practices in schools of Agriculture be retrained in the 25 competencies identified by this study through workshops and short duration courses by the stakeholders.

Bature, (2002) conducted a study on in-service needs of technical teachers in Kaduna State secondary schools. The population consisted of 168 technical teachers. Questionnaire was used as the instrument for data collection, and based on 5-point Likert scale. Mean was used to answer the research questions while the t-test was employed to test the null hypotheses. The major findings of the study revealed that: out of the 79 questionnaire items that were presented, 77 of the items were accept for in-service training. In other words only two of the items were not accepted for in-service training include the following: to effectively know one’s areas of strength and weakness require some training. This was under the heading manipulative and technical skills understanding the effect of Federal legislative and programmes in education through financial support and Supreme Court decisions. It was discovered that technical teachers in Kaduna State are willing to learn on the job. Hence they need to be encouraged. That technical teacher’ in-service providers should adopt the teaching competencies enumerated in the study for in-service training activities.

Olaitan, Alaribe and Nwobu (2009) conducted a study on capacity building needs of teachers of Agriculture for effective teaching in upper basic schools in Abia State. The population for the study was 384 teachers of Agriculture at the Junior Secondary School. Questionnaire was the instrument used for data collection, and was based on 4-point scale. The data collected were analyzed using frequency and percentage scores. The findings of the study revealed that the teachers require capacity building in Agricultural education program of Colleges of Education in teaching skills, animal production, crop production, Agricultural Engineering and Soil Science, the teachers require capacity building in the curriculum content of Agriculture programme of Colleges of Education in order to be more effective in teaching Agriculture in Junior Secondary Schools. Olaitan, et al recommended capacity building programs for teachers of Agricultural education of Colleges of Education in teaching skills, animal production, crop production, Agricultural engineering and soil science.

Dimelu (2010) conducted a study on competency improvement needs of teachers of Home Economics in the use of ICT for effective teaching in Colleges of Education in South eastern, Nigeria. The population consisted of 105 teachers of Home Economics. Questionnaire was used as the instrument for data collection. Weighted mean and improvement need index (INI) were used to answer the research questions. The findings of the study are that teachers of Home Economics were deficient in 16 competencies items in word processing, 13 items in internet usage and 15 items in the use of power point. Therefore, it was recommended that teachers of Home Economics should be exposed to further training in ICT compliance through short courses (in-service training), workshops and seminars to improve them.

**Summary of Literature Review**

Competency is described by so many authors as knowledge, skill, or attitude that enables one to effectively perform the activities of a given occupation or function to the standards expected in employment. Introductory and basic technologies in secondary schools were also defined in the literature as integrated subjects found in junior secondary schools for stimulating students technologically. Some competencies improvement needs of teachers of basic technology in instruction, teaching the content of basic technology curriculum to students in junior secondary schools, classroom/laboratory management, using teaching methods and techniques, and competencies in applying evaluation techniques for the implementation of basic technology were reviewed. Theory of needs was reviewed and the relationship with the present study was established.

Many related empirical studies were also reviewed in order to show the researcher the suitable methodology to be adopted for the study. In addition, empirical studies on competency improvement needs of teachers for effective teaching were reviewed. These include the studies of Bakare and Owodunni (2011), Olaitan, Amusa and Ellah (2009) and Dimelu (2010) among others. It is imperative to state that none of these studies specifically focused on determining the competency improvement needs of teachers of basic technology even despite the relevance of the subject to the overall technological development of the nation at the long run. In order to bridge the exiting gap, this sudy was carried out to determine the competency improvement needs of introductory technology teachers in the implementation of basic technology in Kogi State.

**CHAPTER THREE**

**METHODOLOGY**

This chapter is presented under the following sub-headings: design of the study, area of the study, population for the study, instrument for data collection, validation of the instrument, reliability of the instrument, method of data collection and method of data analysis.

**Design of the Study**

The study adopted survey research design. Survey research design in the opinion of Ali (2006) is a descriptive study which uses sample of an investigation to document, describe and explain what is in existence or non-existent on the present status of phenomena being investigated. Cohen, Manion and Morrison (2009) also added that survey research is concerned with condition or relationships that exist; practices that prevail, beliefs, points of views, or attitudes that are held, processes that are going on, effects that are being felt, or trends that are developing. This design is therefore suitable for this study because it enabled the researcher to elicit information from the entire population on the issues under investigation.

**Area of the Study**

The study was carried out in 239 secondary schools and three colleges of education in Kogi State where basic technology is taught as a subject. The people of the state are interested in their children learning technology related subjects in secondary schools to acquire basic skills. But research evidence revealed that most of the teachers of technology lack competencies in teaching new basic technology to students.

**Population for the Study**

The population for this study was 344 teachers of basic technology and supervisors of basic technology. Kogi State comprises of three educational zones; namely Eastern, Central and Western educational zones. Teachers of basic technology in the eastern zone are 160, central zone 75 and western zone 95 respectively, while the supervisors of basic technology are 14 across the three educational zones in the state. The information on teachers of basic technology is from the state Post-Primary Education Board.

**Sample and Sampling Technique**

There was no sampling since the whole population was involved in the study, because the population was manageable

**Instrument for Data Collection**

The instrument for data collection was a structured questionnaire titled: Competency Needs of Teachers Questionnaire (CNTQ). The questionnaire items were generated after extensive review of available literature on competency need of teachers of technology. The items in the questionnaire were organized in accordance with the research questions developed to guide the study.

The questionnaire was in two parts of the same question items. The first part was to collect data from the teachers of basic technology while second part was designed to elicit data from the supervisors of basic technology. Each of the parts has the same sections; I, II, III, IV and V respectively. Section I contains 17 items designed to competence improvement needs of teachers of technology in instructional techniques. Section II contains 54 items to determine competency improvement needs of teachers of technology in teaching the curriculum contents of basic technology. Section III contains 14 items designed to obtain information on competency improvement needs of teachers of technology in classroom/laboratory management. Section IV contains 9 items to determine competency needs of teachers of technology in using teaching methods and techniques and Section V contains 11 items designed to obtain responses on competency improvement needs of teachers of introductory technology in applying evaluation techniques.

The questionnaire has two type of response scale; the needed and performance scale. The needed category is based on 4-point scale with nominal values assigned as

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| follows: |  |  |  |  |
| Highly Needed | (HN) = | | 3.50 | – 4.49 |
| Needed | (N) | = | 2.50 | – 3.49 |
| Moderately Needed | (SN) | = | 1.50 | – 2.49 |
| Not Needed | (NN | = | 1.00 | – 1.49, |

While the performance type is also 4-point Likert scale assigned as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| High Performance | (HP) | = | 3.50 | – 4.49 |
| Moderate Performance | (MP) | = | 2.50 | – 3.49 |
| Low performance | (LP) | = | 1.50 | – 2.49 |
| No Performance | (NP) | = | 0.50 | – 1.49. |

**Validation of the Instrument**

The instrument was face-validated by three experts in the Department of Vocational Teacher Education, University of Nigeria, Nsukka. The Validates were given a copy each of the questionnaire to indicate any irrelevant statement(s) or wrongly worded items. They were also requested to proffer suggestions for improving the instrument in meeting the purpose of the study. The suggestions and recommendations of validates were integrated into the modified copy of the questionnaire for data collection.

**Reliability of the Instrument**

The internal consistency of the instrument was determined using Cronbach Alpha coefficient method. Twenty copies of the instrument were administered to 20 teachers of basic technology Kogi State. These respondents were not part of the sample for the study. The responses from the administration of the questionnaire were analyzed using Statistical Package for Social Science (SPSS) 16 versions in which Cronbach Alpha reliability coefficients of 0.82 and 0.77 were obtained for the two sets of instrument.

**Method of Data Collection**

The questionnaire were administered on the respondents by the researcher through personal contact and with the help of three assistants. The respondents were given one week to study and respond to the questionnaire. A return visit was made by the researcher and the assistants to collect the completed questionnaire after two weeks of the administration.

**Method of Data Analysis**

Weighted Mean and Improvement Needed Index (INI) was employed to analyze data from the competency cluster questionnaire item in order to identify areas where teachers of technology need improvement in implementing or teaching basic technology to students in junior secondary schools in Kogi State. t-test statistics was used to test the null hypotheses at 0.05 level of significance.

Competency needs was determined as follows:

1. The mean (Xn) of the needed category was determined for each item.
2. The mean (Xp) of the performance category was determined for each item.
3. The performance gap (PG) was determine by finding the difference between the values of the two means. That is, Xn – Xp = PG.

Where PG is zero (0), it means that improvement is not needed for that item because the level at which the teachers perform the skill is equal to the level at which the skill is needed. Where PG is negative (-), it means improvement is not needed for that item because the level at which the teachers perform the skill is higher than the level at which it is needed. Where PG is positive (+), it means improvement is needed because the level at which the teachers perform the skills is lower than the level at which it is needed.

In taking decision for needed, any item with mean of 3.50 and above was considered as highly needed, 2.50 – 3.49 was consid ered as moderately needed while any item with mean of less than 1.50 was considered as not needed while for performance, any item with mean of 3.50 and above was considered as high performance, 2.50 – 3.49 was considered as moderate performance while any item with mean of less than 1.50 was considered as no performance. For the hypotheses, if the t-calculated is more than the t-table, the null hypotheses will be rejected but if the t-cal is less than the t-table, the null hypotheses was accepted.

**CHAPTER FOUR**

**PRESENTATION AND ANALYSIS OF DATA**

In this chapter, the data collected for the study were analyzed to provide answers to the research questions that guided the study and test the null hypotheses formulated. The findings were also presented based on the research questions and hypotheses tested.

**Research Question 1**

What are the competency improvement needs of teachers of technology in planning instruction for the implementation of basic technology?

The data for answering research question one are presented in Table 1

**Table 1**

**Performance Gap Analysis of the Mean Ratings of the Responses of Respondents on the Competency Improvement Needs of Teachers of Technology in Planning Instruction for**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **the Implementation of Basic Technology** | | | **N=331** | | | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  | | | |  |  |
| **S/N** | **Competency items** |  |  |  |  |  |  |  |  |  | **PG** | | | |  | **Remarks** |
|  |  | X **r** | | |  |  |  |  |
|  |  | X **P** | | |  |  |  |  |  | **p** |
|  |  | X **r-** X | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **A** | **Planning Instruction in Basic Technology** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | Stating the behavioral objectives | |  | 3.64 | | | 3.57 | | | 0.07 | | | | | | Needed |
| 2. | Stating the previous knowledge |  |  | 3.66 | | | 2.63 | | | 1.03 | | | | | | Needed |
| 3. | Determining instructional materials | |  | 3.66 | | | 3.08 | | | 0.58 | | | | | | Needed |
| 4. | Organizing instructional materials | |  | 3.76 | | | 2.48 | | | 1.28 | | | | | | Needed |
| **B.** | **Implementing Instructions** | **in** | **Basic** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Technology** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5. | Introduce the lesson through the use of any | | | 3.67 | | | 2.14 | | | 1.53 | | | | | | Needed |
|  | appropriate teaching methods |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6. | Organizing sequentially the | instructional | | 3.90 | | | 3.80 | | | 0.10 | | | | | | Needed |
|  | materials |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7. | Use of relevant teaching aids |  |  | 3.25 | | | 3.67 | | | -0.42 | | | | | | Not |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Needed |
| 8. | Reinforcing learning activities |  |  | 3.66 | | | 2.18 | | | 1.48 | | | | | | Needed |
| 9. | Directing classroom instruction |  |  | 3.72 | | | 3.54 | | | 0.18 | | | | | | Needed |
| 10. | Employing varieties of teaching method | | | 3.81 | | | 2.20 | | | 1.61 | | | | | | Needed |
| 11. | Involving ICT in teaching basic technology | | | 3.92 | | | 2.82 | | | 1.10 | | | | | | Needed |

1. **Evaluating Instructional process**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 12 | Evaluating the quality of instruction | 3.75 | 2.55 | 1.20 | Needed |
| 13 | Evaluating performance of students through | 3.59 | 3.05 | 0.54 | Needed |
|  | demonstration of test |  |  |  |  |
| 14 | Applying appropriate evaluation techniques | 3.64 | 2.01 | 1.63 | Needed |
| 15 | Involving students in evaluating one another | 3.02 | 3.50 | -0.48 | Not |
|  |  |  |  |  | Needed |
| 16 | Developing test and rating sheet | 3.50 | 2.89 | 0.61 | Needed |
| 17 | Administering and analyzing test | 3.62 | 2.91 | 0.71 | Needed |
|  |  |  |  |  |  |

Data in Table 1 revealed that 15 out of 17 items had performance gap values ranged from 0.07 to 1.63 and were positive indicating that the teachers of technology needed 15 competencies in planning instruction for the implementation of basic technology in junior secondary schools. Two out of 17 items had their performance gap as follow (-0.42, -0.48) and were all negative indicating that teachers did not need the competencies 7 and 15 for planning instruction on basic technology. Generally, teachers of technology needed all the 17 competencies in planning instruction for the implementation of basic technology but less emphasizes on the two items with negative performance gap values.

**Research Question 2**

What are the competency improvement needs of teachers of technology in teaching the contents of basic technology curriculum to students in junior secondary schools?

The data for answering research question 2 are presented in Table 2

**Table 2**

**Performance Gap Analysis of the Mean Ratings of the Responses of Respondents on the Competency Improvement Needs of Teachers of Introductory Technology in Teaching the Contents of Basic Technology Curriculum to Students in Junior Secondary Schools N = 331**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Competency items** |  |  |  |  |  |  |  |  | **PG** | | |  | **Remarks** |
| X **r** | | |  |  |  |  |
| X **P** | | |  |  |  |  |  | **p** |
| X **r-** X | | | | |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  | | |  | | |  | | | |  |  |  |
| 1. | Concept of technology | 3.52 | | | 3.01 | | | 0.51 | | | |  |  | Needed |
| 2. | Technology and society | 3.64 | | | 3.57 | | | 0.07 | | | |  |  | Needed |
| 3. | Technology and its applications | 3.66 | | | 2.63 | | | 1.03 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 4. | Workshop safety rules and regulation | 3.66 | | | 3.08 | | | 0.58 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 5. | Properties of materials | 3.76 | | | 2.48 | | | 1.28 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 6. | Drawing instruments and materials | 3.64 | | | 2.34 | | | 1.30 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 7. | Board practice | 3.67 | | | 2.14 | | | 1.53 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 8. | Free hand sketching | 2.80 | | | 3.80 | | | 1.00 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 9. | Scale and scale drawing | 3.95 | | | 2.02 | | | 1.93 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 10. | Woodwork hand tools | 3.66 | | | 2.18 | | | 1.48 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 11. | Concept of energy and power | 3.72 | | | 3.54 | | | 0.18 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 12. | Basic electronic devices | 3.81 | | | 2.20 | | | 1.61 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 13. | Types of building and material | 3.92 | | | 2.82 | | | 1.10 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 14. | Simple blueprint reading | 3.74 | | | 2.81 | | | 0.93 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 15 | Concepts of maintenance | 3.75 | | | 2.55 | | | 1.20 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 16 | Information and communication technology | 3.59 | | | 3.05 | | | 0.54 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 17 | Teaching of first aid | 3.64 | | | 2.01 | | | 1.63 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 18 | First aid materials | 3.72 | | | 3.54 | | | 0.18 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 19 | Uses of materials | 3.81 | | | 2.20 | | | 1.61 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 20 | Geometrical construction | 3.92 | | | 2.82 | | | 1.10 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 21 | Metalwork hand tools | 2.88 | | | 3.01 | | |  |  |  |  |  |  | Not |
|  |  |  |  |  |  |  |  | -0.13 | | | |  |  | Needed |
| 22 | Energy based technological appliances | 3.75 | | | 2.55 | | | 1.20 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 23 | Transmission of electricity | 3.59 | | | 3.05 | | | 0.54 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 24 | Site preparation | 3.64 | | | 2.01 | | | 1.63 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 25 | Setting out | 3.02 | | | 3.50 | | |  |  |  |  |  |  | Not |
|  |  |  |  |  |  |  |  | -0.48 | | | |  |  | Needed |
| 26 | Simple maintenance | 3.50 | | | 2.89 | | | 0.61 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |
| 27 | Career prospects and opportunities in | 3.62 | | | 2.91 | | |  |  |  |  |  |  | Needed |
|  | technology |  |  |  |  |  |  | 0.71 | | | |  |  |  |
| 28 | Production of materials | 3.72 | | | 3.54 | | | 0.18 | | | |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 29 | Teaching the concept of wood | 3.81 | 2.20 |
| 30 | Teaching the concept of metal | 3.92 | 2.82 |
| 31 | Clay, ceramic and glass | 2.66 | 3.18 |
| 32 | Plastics and rubbers | 3.46 | 2.78 |
| 33 | Isometric drawing | 3.64 | 2.84 |
| 34 | Oblique drawing | 3.60 | 2.24 |
| 35 | Orthographic project | 3.42 | 2.99 |
| 36 | One –point perspective drawing | 3.75 | 2.72 |
| 37 | Woodwork machines | 3.66 | 2.18 |
| 38 | Simple woodwork project | 3.82 | 3.60 |
| 39 | Metalwork machine | 3.51 | 2.40 |
| 40 | Simple metalwork projects | 3.72 | 2.62 |
| 41 | Soldering and brazing | 2.66 | 1.18 |
| 42 | Mechanical energy transmission systems | 3.46 | 2.78 |
| 43 | Teaching of friction | 3.64 | 3.84 |
| 44 | Belt drives | 3.60 | 2.24 |
| 45 | Gear and gearing | 3.61 | 1.80 |
| 46 | Linear motion | 3.06 | 2.13 |
| 47 | Rotary motion | 2.66 | 1.18 |
| 48 | Air flow | 3.46 | 2.78 |
| 49 | Pneumatics | 3.64 | 2.84 |
| 50 | Simple electrical wiring | 3.61 | 1.80 |
| 51 | Foundation | 3.06 | 2.13 |
| 52 | Wall | 2.66 | 1.18 |
| 53 | Floors | 3.46 | 2.78 |
| 54 | Doors | 3.84 | 3.64 |

1.61

1.10

-0.52

0.68

0.80

1.36

0.43

1.03

1.48

0.22

1.11

1.10

1.48

0.68

-0.20

1.36

1.81

0.93

1.48

0.68

0.80

1.81

0.93

1.48

Needed Needed Not

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Not

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Data in Table 2 revealed that 50 out of 54 items had performance gap values ranged from 0.10 to 1.93 and were positive indicating that the teachers of technology needed 50 competencies in teaching the contents of basic technology curriculum to students in junior secondary schools. Four out of 54 items had their performance gap as follow (-0.13, -0.48, 0.52, -0.20) and were all negative indicating that teachers did not need the competencies 21, 25, 31 and 43 for teaching the contents of basic technology curriculum to students. Generally, teachers of technology needed all the 54 competencies in teaching contents of basic technology to students in junior secondary schools but less emphasizes on the four items with negative performance gap values.

**Research Question 3**

What are the competency improvement needs of teachers of technology in classroom management for the implementation of basic technology?

The data for answering research question three are presented in Table 3

**Table 3**

**Performance Gap Analysis of the Mean Ratings of the Responses of Respondents on the Competency Improvement Needs of Teachers of Technology in Classroom**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Management for the Implementation of Basic Technology** | | | | |  |  |  |  |  |  |  |  | **N=331** |
|  |  |  |  |  |  |  |  |  |  | | | |  |
| **S/N** | **Competency items** |  |  |  |  |  |  |  | **PG** | | | | **p Remarks** |
| X **r** | | |  |  |  |
| X **P** | | |  |  |  |  |  |
| X **r-** X | | | | |
|  |  |  |  |  |  |  |  |  |

1. **Planning**
2. Make available tools and equipment to be used
3. Make the tools and equipment in good condition
4. Arrange facilities in order of the needs for instruction
5. Arrange classroom setting to accommodate various instructional activities
6. Provide safety poster in the laboratory to encourage correct safety habit in sequence and logical order
7. Arrange benches and machines properly to facilitate learning
8. **Coordinating**
9. Check attendance for each student daily
10. Supervise students activities in classroom/ laboratory
11. Apply corrective measures to enhance discipline in the classroom / laboratory
12. Organize routine cleaning procedure for the laboratory facilities
13. Assign leaders among students to coordinate activities among themselves
14. **Evaluation**
15. Check for the appropriateness of workshop facilities
16. Assess the effectiveness of instruction in the workshop through students practical test
17. Check laboratory tools and equipment after use

3.61 1.80 1.81

3.06 2.13 0.93

2.66 1.18 1.48

3.46 2.78 0.68

3.64 2.84

0.80

3.60 2.24 1.36

3.75 2.72 1.03

3.66 2.18 1.48

3.82 3.60 0.22

3.51 2.40 1.11

3.72 2.62 1.10

3.86 2.91 0.95

3.68 2.96 0.72

2.66 3.65

-0.99

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Needed

Not

Needed

Data in Table 3 revealed that 11 out of 14 items had performance gap values ranged from 0.22 to 1.81 and were positive indicating that the teachers of technology needed 13 competencies in classroom management. One out of 14 items had their performance gap as follow (-0.99) and was negative indicating that teachers of technology did not need the competencies 14 for class management. Generally, teachers of technology need all the 14 competencies in classroom management but less emphasizes on the one item with negative performance gap value.

**Research Question 4**

What are the competency improvement needs of teachers of introductory technology in applying teaching methods and techniques for the implementation of basic technology?

The data for answering research question four are presented in Table 4

**Table 4**

**Performance Gap Analysis of the Mean Ratings of the Responses of Respondents on the Competency Improvement Needs of Teachers of Technology in applying Teaching Methods**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **and Techniques for the Implementation of Basic Technology** | | | | | | | **N=331** | | | | | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  | | |  |  |
|  | **S/N** | **Competency items** |  |  |  |  |  |  |  |  | **PG** | | |  | **Remarks** |
|  | X **r** | | |  |  |  |  |
|  | X **P** | | |  |  |  |  |  | **p** |
|  | X **r-** X | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  | |  |  |  |  |  |  |  |  |
|  | 1. | Group the students in a large class for | 3.33 | | | 3.59 | |  |  |  |  |  |  |  | Not |
|  |  | demonstration process |  |  |  |  |  |  | -0.26 | | |  |  |  | Needed |
|  | 2. | Present information with projector | 3.69 | | | 2.58 | |  | 1.11 | | |  |  |  | Needed |
|  | 3. | Present concepts and skills before 3.65 | | | | 2.64 | |  |  |  |  |  |  |  | Needed |
|  |  | demonstration commence |  |  |  |  |  |  | 1.01 | | |  |  |  |  |
|  | 4. | Involve the students in all activities during | 3.66 | | | 3.08 | |  |  |  |  |  |  |  | Needed |
|  |  | learning process |  |  |  |  |  |  | 0.58 | | |  |  |  |  |
|  | 5. | Use appropriate teaching methods as 3.76 | | | | 2.58 | |  |  |  |  |  |  |  | Needed |
|  |  | demonstration method |  |  |  |  |  |  | 1.18 | | |  |  |  |  |
|  | 6. | Perform the learning process during 3.68 | | | | 2.35 | |  |  |  |  |  |  |  | Needed |
|  |  | demonstration before the students |  |  |  |  |  |  | 1.33 | | |  |  |  |  |
|  | 7. | Employ team teaching during demonstration | 3.67 | | | 2.04 | |  | 1.63 | | |  |  |  | Needed |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 8. | Visit students while performing their tasks | 3.61 | | | 3.72 | |  |  |  |  |  |  |  | Not |
|  |  |  |  |  |  |  |  |  | -0.11 | | |  |  |  | Needed |
|  | 9. | Make demonstration work and activities to | 3.62 | | | 2.12 | |  |  |  |  |  |  |  | Needed |
|  |  | be meaningful to the learners |  |  |  |  |  |  | 1.50 | | |  |  |  |  |

Data in Table 4 revealed that 7 out of 9 items had performance gap values ranged from 0.58 to 1.63 and were positive indicating that the teachers of technology needed seven competencies in applying teaching methods and techniques for the implementation of basic technology. Two out of nine items had their performance gaps as follow (-0.26, 1.11) and were all negative indicating that teachers of technology did not need the competencies 1 and 8 for the implementation of basic technology. Generally, teachers of technology need all the nine competencies for the implementation of basic technology in junior secondary schools but less emphasis on the two items with negative performance gap values.

**Research Question 5**

What are the competency improvement needs of teachers of introductory technology in evaluating outcome of learning in basic technology?

The data for answering research question five are presented in Table 5

**Table 5**

**Performance Gap Analysis of the Mean Ratings of the Responses of Respondents on the Competency Improvement Needs of Teachers of Technology in Applying Evaluation**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Techniques for Assessing the Outcome of Learning in Basic Technology** | | | | | | | | | | | | **N=331** |
|  |  |  |  |  |  |  |  |  |  |  |  | |  |
|  | **S/N** | **Competency items** |  |  |  |  |  |  |  |  | **PG** | | **p Remarks** |
|  | X **r** | | |  |  |  |
|  | X **P** | | |  |  |  |  |
|  | X **r-** X | | | |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  | | |  | | | |  |
|  | 1. | Evaluate students affective domain | 3.62 | | | 3.02 | | | 0.60 | | | | Needed |
|  | 2. | Assess students psychomotor performance | 3.89 | | | 3.58 | | | 0.31 | | | | Needed |
|  | 3. | Construct reliable test to evaluate students | 3.66 | | | 2.63 | | |  |  |  |  | Needed |
|  |  | progress |  |  |  |  |  |  | 1.03 | | | |  |
|  | 4. | Assess the effectiveness of the teaching | 3.68 | | | 3.08 | | |  |  |  |  | Needed |
|  |  | strategy |  |  |  |  |  |  | 0.60 | | | |  |
|  | 5. | Make record about students academic ability | 3.48 | | | 3.26 | | |  |  |  |  | Not |
|  |  |  |  |  |  |  |  |  | -0.60 | | | | Needed |
|  | 6. | Provide records about students moral | 2.34 | | | 3.64 | | |  |  |  |  | Needed |
|  |  | character and personality |  |  |  |  |  |  | 0.13 | | | |  |
|  | 7. | Make use of information procedure like | 3.67 | | | 2.14 | | |  |  |  |  | Needed |
|  |  | observation for collection of information |  |  |  |  |  |  |  |  |  |  |  |
|  |  | about students |  |  |  |  |  |  | 0.35 | | | |  |
|  | 8. | Use varieties of evaluation techniques and | 3.82 | | | 3.01 | | |  |  |  |  | Needed |
|  |  | procedures such as test, assessment and |  |  |  |  |  |  |  |  |  |  |  |
|  |  | project |  |  |  |  |  |  | 1.53 | | | |  |
|  | 9. | Give test periodically to monitor learning | 3.95 | | | 3.02 | | |  |  |  |  | Needed |
|  |  | process during instruction |  |  |  |  |  |  | 0.81 | | | |  |
|  | 10. | Evaluate the students learning difficulties | 3.67 | | | 3.18 | | |  |  |  |  | Needed |
|  |  | during instruction |  |  |  |  |  |  | 0.93 | | | |  |
|  | 11. | Use the evaluation records available to | 3.72 | | | 3.54 | | |  |  |  |  | Needed |
|  |  | determine the level of academic attainment |  |  |  |  |  |  |  |  |  |  |  |
|  |  | by students |  |  |  |  |  |  | 0.49 | | | |  |

Data in Table 5 revealed that 10 out of 11 items had performance gap values ranged from 0.13 to 1.53 and were positive indicating that the teachers of technology needed 10 competencies in evaluating outcomes of learning in basic technology. One out of 11 items had performance gap of -0.60 which was negative indicating that teachers of technology did not need the competency 5 for evaluating the learning outcome in basic technology. Generally, teachers of technology need all the 11 competencies for evaluating the outcome of learning in basic technology but less emphasizes on one item with negative performance gap value.

**Testing of Hypotheses**

**Hypothesis 1**

There is no significant difference in the mean responses of teachers and supervisors of technology on the competencies improvement needs in planning instruction for the implementation of basic technology

The data required for testing the hypothesis one is presented in Table 6.

**Table 6**

**The t-test Analysis of the Mean Responses of the Teachers and Supervisors on the Competencies Improvement Needs in Planning Instruction for the Implementation of Basic Technology**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **S/N** |  |  |  |  |  |  | **S12** |  |  |  | **S22** | **p-** |  |
|  |  |  | **Item statements** | |  |  | **X1** |  | **X2** | | **values** | **Remarks** |
|  | 1 | Stating the behavioral objectives | | |  |  | 3.27 | 0.76 | 3.50 | | | 0.85 | 0.86 | NS |
|  | 2 | Stating the previous knowledge | | |  |  | 3.29 | 0.75 | 3.35 | | | 0.63 | 0.50 | NS |
|  | 3 | Determining instructional materials | | |  |  | 3.27 | 0.71 | 3.42 | | | 0.65 | 0.94 | NS |
|  | 4 | Organizing instructional materials | | |  |  | 3.28 | 0.67 | 3.35 | | | 0.74 | 0.44 | NS |
|  | 5 | Introduce the lesson through the | | | use | of any | 3.06 | 0.83 | 3.07 | | | 0.92 | 0.74 | NS |
|  |  | appropriate teaching methods | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 6 | Organizing | sequentially | the | instructional | | 3.12 | 0.74 | 3.21 | | | 0.69 | 0.86 | NS |
|  |  | materials |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 7 | Use of relevant teaching aids | |  |  |  | 3.22 | 0.76 | 3.42 | | | 0.75 | 0.81 | NS |
|  | 8 | Reinforcing learning activities | | |  |  | 3.30 | 0.73 | 3.50 | | | 0.75 | 0.80 | NS |
|  | 9 | Directing classroom instruction | | |  |  | 3.24 | 0.68 | 3.35 | | | 0.63 | 0.99 | NS |
|  | 10 | Employing varieties of teaching method | | | |  | 3.26 | 0.75 | 3.42 | | | 0.85 | 0.81 | NS |
|  | 11 | Involving ICT in teaching basic technology | | | | | 3.16 | 0.74 | 3.14 | | | 0.95 | 0.25 | NS |
|  | 12 | Evaluating the quality of instruction | | |  |  | 3.11 | 0.81 | 3.21 | | | 1.05 | 0.55 | NS |
|  | 13 | Evaluating | performance of | students | | through | 3.05 | 0.76 | 3.28 | | | 0.82 | 0.53 | NS |
|  |  | demonstration of test | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 14 | Applying appropriate evaluation techniques | | | | | 2.85 | 0.70 | 2.78 | | | 0.57 | 0.72 | NS |
|  | 15 | Involving students in evaluating one another | | | | | 2.95 | 0.77 | 2.85 | | | 0.86 | 0.49 | NS |
|  | 16 | Developing test and rating sheet | | |  |  | 2.89 | 0.77 | 3.00 | | | 0.68 | 0.28 | NS |
|  | 17 | Administering and analyzing test | | |  |  | 2.78 | 0.86 | 2.92 | | | 0.73 | 0.17 | NS |
|  |  |  | | | |  |  |  |  |  |  |  |  |  |
|  | *Key:* | *S12 = Variance of Technology Teachers* | | | |  |  |  |  |  |  |  |  |  |



*S22 = Variance of supervisors*

*X1 = Mean of technology teachers*

*X2 = Mean of supervisors*

*Df = 249*

*P = 0.05*

*S = Significant*

*NS = Not Significant*

Data presented in Table 6 revealed that each of the items had their p-values ranged from 0.17 to 0.99 which were greater than 0.05 at 249 degree of freedom. There was no significant difference in the mean responses of teachers and supervisors of introductory technology on the competencies improvement needs in planning instruction for the implementation of basic technology.

Therefore, the null hypothesis of no significant difference in the mean responses of teachers and supervisors of introductory technology on the competencies improvement needs in planning instruction for the implementation of basic technology was upheld.

**Hypothesis 2**

There is no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in teaching the contents of basic technology curriculum to students in junior secondary schools

The data required for testing the hypothesis one is presented in Table 7.

**Table 7**

**The t-test Analysis of the Mean Responses of the Teachers and Supervisors of Technology on the Competency Improvement Needs in Teaching the Contents of Basic Technology Curriculum to Students in Junior Secondary Schools**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/N** |  |  |  |  |  | **P-** |
| **Item statements** | **X** | **1** | **S12** | **X** | **2** | **S22values Remarks** |

1. Concept of technology
2. Technology and society
3. Technology and its applications
4. Workshop safety rules and regulation
5. Properties of materials
6. Drawing instruments and materials
7. Board practice
8. Free hand sketching
9. Scale and scale drawing
10. Woodwork hand tools
11. Concept of energy and power
12. Basic electronic devices
13. Types of building and material
14. Simple blueprint reading
15. Concepts of maintenance
16. Information and communication technology
17. Teaching of first aid
18. First aid materials
19. Uses of materials
20. Geometrical construction
21. Metalwork hand tools
22. Energy based technological appliances
23. Transmission of electricity
24. Site preparation
25. Setting out
26. Simple maintenance
27. Career prospects and opportunities in technology
28. Production of materials
29. Teaching the concept of wood
30. Teaching the concept of metal
31. Clay, ceramic and glass

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2.89 | 0.91 | 2.71 | 0.82 | 0.97 |
| 3.10 | 0.79 | 3.21 | 0.80 | 0.59 |
| 3.00 | 0.85 | 2.78 | 0.89 | 0.90 |
| 3.17 | 0.65 | 3.71 | 0.47 | 0.06 |
| 3.19 | 0.77 | 2.99 | 0.99 | 0.59 |
| 3.05 | 0.69 | 3.43 | 0.69 | 0.89 |
| 3.00 | 0.83 | 2.92 | 0.42 | 0.77 |
| 2.75 | 0.85 | 2.78 | 0.80 | 0.49 |
| 2.98 | 0.74 | 3.21 | 0.73 | 0.71 |
| 2.89 | 0.77 | 2.78 | 0.57 | 0.38 |
| 3.00 | 0.75 | 3.07 | 0.67 | 0.42 |
| 3.17 | 0.85 | 2.78 | 0.96 | 0.98 |
| 3.36 | 0.80 | 3.00 | 0.89 | 0.96 |
| 3.44 | 0.74 | 3.00 | 0.65 | 0.47 |
| 3.30 | 0.82 | 3.21 | 0.64 | 0.29 |
| 3.45 | 0.70 | 3.50 | 0.51 | 0.14 |
| 3.32 | 0.79 | 3.57 | 0.51 | 0.15 |
| 3.40 | 0.73 | 3.57 | 0.51 | 0.10 |
| 3.27 | 0.88 | 3.50 | 0.49 | 0.33 |
| 3.44 | 0.76 | 3.57 | 0.61 | 0.43 |
| 3.54 | 0.65 | 3.64 | 0.64 | 0.83 |
| 3.30 | 0.78 | 3.71 | 0.64 | 0.28 |
| 3.28 | 0.74 | 3.57 | 0.63 | 0.53 |
| 3.31 | 0.81 | 3.57 | 0.72 | 0.57 |
| 3.13 | 0.83 | 3.35 | 0.57 | 0.17 |
| 3.11 | 0.86 | 3.28 | 0.61 | 0.07 |
| 3.09 | 0.82 | 3.21 | 0.49 | 0.50 |
| 3.06 | 0.70 | 3.07 | 0.47 | 0.22 |
| 3.06 | 0.82 | 3.35 | 0.67 | 0.27 |
| 2.96 | 0.78 | 3.07 | 0.77 | 0.92 |
| 2.76 | 0.82 | 3.00 | 0.85 | 0.67 |

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

NS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
| 32 | Plastics and rubbers | 2.82 | 0.83 | 2.85 | 0.82 | 0.71 | NS |
| 33 | Isometric drawing | 2.78 | 0.74 | 2.42 | 0.84 | 0.52 | NS |
| 34 | Oblique drawing | 2.99 | 0.83 | 2.71 | 0.69 | 0.58 | NS |
| 35 | Orthographic project | 2.99 | 0.66 | 2.64 | 0.66 | 0.87 | NS |
| 36 | One –point perspective drawing | 3.05 | 0.84 | 2.78 | 0.53 | 0.50 | NS |
| 37 | Woodwork machines | 3.08 | 0.81 | 2.85 | 0.82 | 0.76 | NS |
| 38 | Simple woodwork project | 3.07 | 0.78 | 3.14 | 0.77 | 0.49 | NS |
| 39 | Metalwork machine | 2.90 | 0.88 | 2.92 | 0.78 | 0.55 | NS |
| 40 | Simple metalwork projects | 3.05 | 0.75 | 3.14 | 0.82 | 0.85 | NS |
| 41 | Soldering and brazing | 2.94 | 0.85 | 3.00 | 0.82 | 0.92 | NS |
| 42 | Mechanical energy transmission systems | 3.12 | 0.92 | 3.07 | 0.91 | 0.70 | NS |
| 43 | Teaching of friction | 3.11 | 0.88 | 2.71 | 0.94 | 0.81 | NS |
| 44 | Belt drives | 3.37 | 0.85 | 2.92 | 0.63 | 0.16 | NS |
| 45 | Gear and gearing | 3.45 | 0.78 | 2.85 | 0.85 | 0.67 | NS |
| 46 | Linear motion | 3.16 | 0.84 | 3.64 | 1.06 | 0.27 | NS |
| 47 | Rotary motion | 3.14 | 0.88 | 3.57 | 0.94 | 0.80 | NS |
| 48 | Air flow | 3.12 | 0.87 | 3.28 | 0.64 | 0.58 | NS |
| 49 | Pneumatics | 3.12 | 0.83 | 3.14 | 0.86 | 0.76 | NS |
| 50 | Simple electrical wiring | 3.08 | 0.83 | 3.42 | 0.91 | 0.85 | NS |
| 51 | Foundation | 3.09 | 0.76 | 3.14 | 0.82 | 0.72 | NS |
| 52 | Wall | 3.17 | 0.80 | 3.07 | 0.91 | 0.57 | NS |
| 53 | Floors | 3.18 | 0.79 | 3.071 | 0.84 | 0.45 | NS |
| 54 | Doors | 3.22 | 0.71 | 3.28 | 0.89 | 0.43 | NS |
|  |  |  |  |  |  |  |  |

Data presented in Table 7 revealed that each of the 54 items had their p-values ranged from 0.06 to 0.98 which were greater than 0.05 at 249 degree of freedom. This indicated that there was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in teaching the contents of basic technology curriculum to students in junior secondary schools.

Therefore, the null hypothesis of no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in teaching the contents of basic technology curriculum to students in junior secondary schools was upheld.

**Hypothesis 3**

There is no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in classroom management for the implementation of basic technology

The data required for testing the hypothesis three is presented in Table 8.

**Table 8**

**The t-test Analysis of the Mean Responses of the Teachers and Supervisors of Introductory Technology on the Competency Improvement needs in Classroom Management for the Implementation of Basic Technology**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** |  |  |  |  | **S12** |  | **S22** | **P-** |  |
|  | **Item statements** |  | **X** | **1** | **X2** | **values** | **Remarks** |
| 1 | Make available tools and equipment to be used | 3.29 | | | 0.74 | 3.21 | 1.05 | 0.16 | NS |
| 2 | Make the tools and equipment in good condition | 3.20 | | | 0.77 | 3.00 | 0.96 | 0.50 | NS |
| 3 | Arrange facilities in order of the needs for | 3.16 | | | 0.86 | 3.00 | 1.03 | 0.22 | NS |
|  | instruction |  |  |  |  |  |  |  |  |



1. Arrange classroom setting to accommodate

various instructional activities 3.23 0.77 3.42 0.85 0.78 NS

1. Provide safety poster in the laboratory to

encourage correct safety habit in sequence

and logical order

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | Arrange benches and machines properly to | 3.05 | 0.78 | 2.85 | 0.77 | 0.70 | NS |
|  | facilitate learning |  |  |  |  |  |  |
| 7 | Check attendance for each student daily | 2.95 | 0.77 | 2.92 | 0.82 | 0.93 | NS |
| 8 | Supervise students activities in classroom/ | 2.79 | 0.82 | 2.85 | 0.66 | 0.23 | NS |
|  | laboratory |  |  |  |  |  |  |
| 9 | Apply corrective measures to enhance discipline | 2.77 | 0.79 | 2.42 | 0.51 | 0.28 | NS |
|  | in the classroom / laboratory |  |  |  |  |  |  |
| 10 | Organize routine cleaning procedure for the | 2.90 | 0.72 | 2.85 | 0.86 | 0.37 | NS |
|  | laboratory facilities |  |  |  |  |  |  |
| 11 | Assign leaders among students to coordinate | 2.88 | 0.82 | 2.57 | 0.75 | 0.95 | NS |
|  | activities among themselves |  |  |  |  |  |  |
| 12 | Check for the appropriateness of workshop | 3.15 | 0.70 | 3.14 | 0.53 | 0.23 | NS |
|  | facilities |  |  |  |  |  |  |
| 13 | Assess the effectiveness of instruction in the | 3.18 | 0.80 | 3.00 | 0.96 | 0.66 | NS |
|  | workshop through students practical test |  |  |  |  |  |  |
| 14 | Check laboratory tools and equipment after use | 3.12 | 0.69 | 3.00 | 0.39 | 0.61 | NS |
|  |  |  |  |  |  |  |  |

93

Data presented in Table 8 revealed that each of the 14 items had their p-values ranged from 0.16 to 0.93 which were greater than 0.05 at 249 degree of freedom. This indicated that there is no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in classroom management for the implementation of basic technology.

Therefore, the null hypothesis of no significant difference in the mean responses of teachers and supervisors of introductory technology on the competency improvement needs in classroom management for the implementation of basic technology was accepted.

**Hypothesis 4**

There is no significant difference in the mean responses of teachers and supervisors of introductory technology on the competency improvement needs in using teaching methods and techniques for the implementation of basic technology

The data required for testing the hypothesis one is presented in Table 9.

**Table 9**

**The t-test Analysis of the Mean Responses of the Teachers and Supervisors on the Competency Improvement Needs in Using Teaching Methods and Techniques for the Implementation of Basic Technology**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **S12** |  |  |  | **S22** | **P-** |  |
| **S/N** | **Item statements** | **X** | **1** |  | **X** | **2** | **values** | **Remarks** |
| 1 | Group the students in a large class for | 3.07 | | 0.79 | 3.07 | | | 0.73 | 0.17 | NS |
|  | demonstration process |  |  |  |  |  |  |  |  |  |

2

3

4

5

6

7

8

9

Present information with projector

Present concepts and skills before demonstration commence

Involve the students in all activities during learning process

Use appropriate teaching methods as demonstration method

Perform the learning process during demonstration before the students

Employ team teaching during demonstration

Visit students while performing their tasks

Make demonstration work and activities to be meaningful to the learners

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 2.87 | 0.82 | 2.57 | 0.64 | 0.69 | NS |
| 3.03 | 0.72 | 3.07 | 0.82 | 0.74 | NS |
|  |  |  |  |  |
| 2.91 | 0.76 | 2.71 | 0.61 | 0.84 | NS |
|  |  |  |  |  |
| 2.95 | 0.80 | 2.85 | 0.66 | 0.38 | NS |
|  |  |  |  |  |
| 3.02 | 0.89 | 3.00 | 0.87 | 0.99 | NS |
|  |  |  |  |  |
| 3.30 | 0.82 | 3.07 | 1.07 | 0.46 | NS |
| 3.36 | 0.85 | 3.35 | 0.74 | 0.38 | NS |
| 3.30 | 0.85 | 3.57 | 0.64 | 0.16 | NS |
|  |  |  |  |  |

Data presented in Table 5 revealed that each of the nine items had their p-values ranged from 0.16 to 0.99 which were greater than 0.05 at 249 degree of freedom. This indicated that there was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in using teaching methods and techniques for the implementation of basic technology.

Therefore, the null hypothesis of no significant difference in the mean responses of teachers and supervisors of introductory technology on the competency improvement needs in using teaching methods and techniques for the implementation of basic technology was upheld.

**Hypothesis 5**

There is no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in applying evaluation techniques for the implementation of basic technology.

The data required for testing the hypothesis one is presented in Table 10.

**Table 10**

**The t-test Analysis of the Mean Responses of the Teachers and Supervisors of Technology on the Competency Improvement Needs in Applying Evaluation Techniques for the Implementation of Basic Technology**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **S12** |  |  |  | **S22** | **P-** |  |
| **S/N** | **Item statements** |  | **X1** | |  | **X** | **2** | **values** | **Remarks** |
| 1 | Evaluate students affective domain | 3.55 | | | 0.65 | 3.57 | | | 0.64 | 0.79 | NS |
| 2 | Assess students psychomotor performance | 3.28 | | | 0.83 | 3.28 | | | 0.72 | 0.46 | NS |
| 3 | Construct reliable test to evaluate students | 3.45 | | | 0.67 | 3.42 | | | 0.64 | 0.71 | NS |
|  | progress |  |  |  |  |  |  |  |  |  |  |

* Assess the effectiveness of the teaching strategy
* Make record about students academic ability
* Provide records about students moral character and personality
* Make use of information procedure like observation for collection of information about students

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 3.30 | 0.85 | 3.57 | 0.51 | 0.73 | NS |
|  |  |  |  |  |
| 3.37 | 0.71 | 3.64 | 0.63 | 0.20 | NS |
| 3.43 | 0.68 | 3.35 | 0.92 | 0.15 | NS |
|  |  |  |  |  |
| 3.29 | 0.76 | 3.57 | 0.64 | 0.37 |  |
|  |  |  |  |  | NS |

* Use varieties of evaluation techniques and procedures such as test, assessment and project
* Give test periodically to monitor learning process during instruction

1. Evaluate the students learning difficulties during instruction

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 3.30 | 0.75 | 3.35 | 0.63 | 0.40 |  |
|  |  |  |  |  | NS |
| 3.35 | 0.75 | 3.35 | 0.63 | 0.29 | NS |
|  |  |  |  |  |
| 3.19 | 0.76 | 3.21 | 0.57 | 0.25 | NS |
|  |  |  |  |  |

|  |  |
| --- | --- |
| 11 Use the evaluation records available to 3.34 0.72 3.14 0.53 | 0.21 |
| determine the level of academic attainment | NS |
|  |
| by students |  |
|  |  |

The result presented in Table 5 revealed that each of the 11 items had their p-values ranged from 0.15 to 0.79 which were greater than 0.05 at 249 degree of freedom. This indicated that there was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in applying evaluation techniques for the implementation of basic technology.

Therefore, the null hypothesis of no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in applying evaluation techniques for the implementation of basic technology was upheld.

**Findings of the Study**

The following findings emerged from the study based on the research questions and hypotheses:

**A. Competency improvement needs of teachers of technology in planning instruction for the implementation of basic technology**

1. Stating the behavioral objectives
2. Stating the previous knowledge
3. Determining instructional materials
4. Organizing instructional materials
5. Introduce the lesson through the use of any appropriate teaching methods
6. Organizing sequentially the instructional materials
7. Reinforcing learning activities
8. Directing classroom instruction
9. Employing varieties of teaching method
10. Involving ICT in teaching basic technology
11. Evaluating the quality of instruction
12. Evaluating performance of students through demonstration of test
13. Applying appropriate evaluation techniques
14. Developing test and rating sheet
15. Administering and analyzing test

**B. Competency improvement needs of teachers of technology in teaching the contents of basic technology curriculum to students in junior secondary schools**

1. Concept of technology
2. Technology and society
3. Technology and its applications
4. Workshop safety rules and regulation
5. Properties of materials
6. Drawing instruments and materials
7. Board practice
8. Free hand sketching
9. Scale and scale drawing
10. Woodwork hand tools
11. Concept of energy and power
12. Basic electronic devices
13. Types of building and material
14. Simple blueprint reading
15. Concepts of maintenance
16. Information and communication technology
17. Teaching of first aid
18. First aid materials
19. Uses of materials
20. Geometrical construction
21. Energy based technological appliances
22. Transmission of electricity
23. Site preparation
24. Simple maintenance
25. Career prospects and opportunities in technology
26. Production of materials
27. Teaching the concept of wood
28. Teaching the concept of metal
29. Plastics and rubbers
30. Isometric drawing
31. Oblique drawing
32. Orthographic project
33. One –point perspective drawing
34. Woodwork machines
35. Simple woodwork project
36. Metalwork machine
37. Simple metalwork projects
38. Soldering and brazing
39. Mechanical energy transmission systems
40. Belt drives
41. Gear and gearing
42. Linear motion
43. Rotary motion
44. Air flow
45. Pneumatics
46. Simple electrical wiring
47. Foundation
48. Wall
49. Floors
50. Doors

**C. Competency improvement needs of teachers of technology in classroom management for the implementation of basic technology**

1. Make the tools and equipment in good condition
2. Arrange facilities in order of the needs for instruction
3. Arrange classroom setting to accommodate various instructional activities
4. Provide safety poster in the laboratory to encourage correct safety habit in sequence and logical order

5. Arrange benches and machines properly to facilitate learning

1. Supervise students activities in classroom/ laboratory
2. Apply corrective measures to enhance discipline in the classroom / laboratory
3. Organize routine cleaning procedure for the laboratory facilities
4. Assign leaders among students to coordinate activities among themselves
5. Check for the appropriateness of workshop facilities
6. Assess the effectiveness of instruction in the workshop through students practical test

**D. Competency improvement needs of teachers of technology in applying teaching methods and techniques for the implementation of basic technology**

1. Present information with projector
2. Present concepts and skills before demonstration commence
3. Involve the students in all activities during learning process
4. Use appropriate teaching methods as demonstration method
5. Perform the learning process during demonstration before the students
6. Employ team teaching during demonstration
7. Make demonstration work and activities to be meaningful to the learners

**E. Competency improvement needs of teachers of technology in evaluating outcome of learning in basic technology**

1. Evaluate students affective domain
2. Assess students psychomotor performance
3. Construct reliable test to evaluate students progress
4. Assess the effectiveness of the teaching strategy
5. Make record about students academic ability
6. Make use of information procedure like observation for collection of information about students
7. Use varieties of evaluation techniques and procedures such as test, assessment and project
8. Give test periodically to monitor learning process during instruction
9. Evaluate the students learning difficulties during instruction
10. Use the evaluation records available to determine the level of academic attainment by students
11. There was no significant difference in the mean responses of teachers and supervisors of introductory technology on the competencies improvement needs in planning instruction for the implementation of basic technology
12. There was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in teaching the contents of basic technology curriculum to students in junior secondary schools
13. There was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in classroom management for the implementation of basic technology
14. There was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in applying teaching methods and techniques for the implementation of basic technology
15. There was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in evaluating outcomes in basic technology.

**Discussion of findings**

The findings of this study revealed that teachers of technology required improvement in all the 15 planning instructions for the implementation of basic technology in Kogi State. The competencies needed include: stating the behavioral objectives**,** stating the previous knowledge**,** determining instructional materials**,** organizing instructional materials**,** introducing the lesson through the use of any appropriate teaching methods**,** organizing sequentially the instructional materials and reinforcing of learning activities. The findings of the study was in agreement with the of Miller, Bakare and Ikatule (2010) that appropriate and achievable behavioral objectives must be stated for a particular lesson.

The findings of this study in respect to competency improvement needs of teachers in teaching the contents of basic technology revealed that technology teachers need improvement in the following competencies: concept of technology, technology and society, technology and its applications, workshop safety rules and regulation, properties of materials, drawing instruments and materials, board practice, free hand sketching, scale and scale drawing, woodwork hand tools, concept of energy and power, basic electronic devices, types of building and material, simple blueprint reading, concepts of maintenance, information and communication technology, teaching of first aid, first aid materials, uses of materials, geometrical construction, energy based technological appliance and transmission of electricity. The findings were line with the opinion of Ojo

(2005) that technical teachers must acquire relevant competencies before teaching technology

related contents.

The findings of the study as regards improvement needs of teachers in classroom management revealed 13 competency improvement needs of teachers of technology in classroom management for the implementation of basic technology. The competencies include make the tools and equipment in good condition, arrange facilities in order of the needs for instruction, arrange classroom setting to accommodate various instructional activities, provide safety poster in the laboratory to encourage correct safety habit in sequence and logical order, arrange benches and machines properly to facilitate learning, supervise students activities in classroom/ laboratory, apply corrective measures to enhance discipline in the classroom / laboratory, organize routine cleaning procedure for the laboratory facilities and assign leaders among students to coordinate activities among themselves. The findings were line with the opinion of Adeyemi and Uko-Aviomoh (2004) that arrangement of classroom setting and proper accommodation of various instructional activities improve performance of learners.

The findings of the study in respect to improvement needs of teachers of technology in using teaching methods and techniques revealed eight competency improvement needs of teachers of technology in applying teaching methods and techniques for the implementation of basic technology. The competencies include present information with projector**,** present concepts and skills before demonstration commence**,** involve the students in all activities during learning process**,** use appropriate teaching methods as demonstration method**,** perform the learning process during demonstration before the students**,** employ team teaching during demonstration and make demonstration work and activities to be meaningful to the learners. The findings were in agreement with the opinion of Aina (2000) that presentation of concepts and skills before demonstration commence is a good steps to be taken.

The findings of the study as regards improvement needs of teachers of technology in applying evaluation techniques revealed ten competency improvement needs of teachers of technology in evaluating outcome of learning in basic technology. The competencies include evaluate students affective domain, assess students psychomotor performance, construct reliable test to evaluate students progress, assess the effectiveness of the teaching strategy, make record about students academic ability, make use of information procedure like observation for collection of information about students, use varieties of evaluation techniques and procedures such as test, assessment and project, give test periodically to monitor learning process during instruction and evaluate the students learning difficulties during instruction. These findings were in agreement with that James (2002) who found that assessment of the effectiveness of the teaching strategy ensures the achievement of the objectives

**CHAPTER FIVE**

**SUMMARY, CONCLUSIONS, RECOMMENDATION, AND SUGGESTION FOR**

**FURTHER RESEARCH**

This chapter presented the summary, restatement of the problem, procedures used in the study, major findings of the study, conclusion, educational implications of the findings, recommendations for implementation and suggestions for further research were also presented.

**Restatement of the Problem**

Basic technology is an integrated subject in the curriculum of junior secondary schools where students are supposed to acquire basic knowledge, skills and attitudes about technologies. In order to improve the achievement of students in basic technology, teachers are expected to be competent in teaching the content areas of the basic technology curriculum. It is observed by the researcher that 50% of the students who sat for junior WAEC failed in basic technology in 2010 and 2011. It was also observed that 50% were below credit level. The failure of students in basic technology could be attributed to incompetence of teachers of introductory technology in teaching the contents areas of the curriculum. The failure of these students may also be blamed on the government for allowing teachers of introductory technology to teach new basic technology to students since the two subjects are slightly different in objectives. Technical teachers lack effectiveness in managing introductory technology laboratory and preventing wastage of materials. Teachers have shallow knowledge and skills in the subject matter. Similarly, technical teachers have deficiencies in planning and implementing of instruction in introductory technology. Fifty percent of the teachers in Nigerian school system were found unqualified to teach. Also, most of the teachers (teachers of introductory technology now basic technology in Kogi State inclusive) recruited into teaching position in Nigeria do not meet the quality required for effective teaching. Therefore there is need to identify competency improvement needs of introductory technology teachers to enhance the implementation of basic technology in Kogi State. Specifically the study sought to identify:

1. Competency improvement needs of teachers of technology in planning instruction for the implementation of basic technology
2. Competency improvement needs of teachers of technology in teaching the content of basic technology curriculum to students in junior secondary schools
3. Competency improvement needs of teachers of technology in classroom management for the implementation of basic technology
4. Competency improvement needs of teachers of technology in applying teaching methods and techniques for the implementation of basic technology
5. Competency improvement needs of teachers of technology in evaluating the learning outcomes in basic technology

**Summary of the procedure used**

The study adopted survey research design. The study was carried out in 239 secondary schools in Kogi State where basic technology is being taught as a subject. The population of this study was 344 teachers of basic technology and supervisors of basic technology. There was no sampling since the whole population was manageable. The instrument for data collection was a structured questionnaire titled competency needs of teachers questionnaire. The questionnaire has two type of response scale; the needed and performance scale. The instrument was face-validated by three experts in the Department of Vocational Teacher Education, University of Nigeria, Nsukka. The internal consistency of the instrument was determined using Cronbach Alpha coefficient method and 0.84 was obtained. The copies of the questionnaire were administered on the respondents by the researcher through personal contact and with the help of three research assistants. A return visit was made by the researcher and the assistants to collect the completed questionnaire after a week. Weighted Mean and Improvement Needed Index (INI) were employed to analyze data for answering research questions while t-test was used to test the null hypotheses at 0.05 level of significance.

**Major Findings**

The following were the major findings of the study:

1. Teachers of technology need improvement in 15 competencies on instructional planning for the implementation of basic technology
2. Teachers of technology need improvement in teaching 50 out of fifty four contents of basic technology curriculum to students
3. Teachers of technology need improvement in classroom and laboratory management for the implementation of basic technology
4. Teachers of technology need improvement in using varieties of teaching methods and techniques for the implementation of basic technology
5. Teachers of technology need improvement in applying evaluation techniques for assessing the outcome of the lesson on basic technology
6. There was no significant difference in the mean responses of teachers and supervisors of technology on the competencies improvement needs in instruction for the implementation of basic technology
7. There was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in teaching the contents of basic technology curriculum to students in junior secondary schools
8. There was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in classroom/laboratory management for the implementation of basic technology
9. There was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in using teaching methods and techniques for the implementation of basic technology
10. There was no significant difference in the mean responses of teachers and supervisors of technology on the competency improvement needs in using evaluation techniques for the implementation of basic technology.

**Implication of the Study**

The findings of this study had implications for government, training institutions and teachers of technology. Government through various agencies will build the capacity of teachers of technology for effective implementation of basic technology in junior secondary schools in the state. The capacity can be built through organizing workshop and seminars for teachers. It is expected that training institutions such as colleges of education should review their curricula for the training of individuals for the implementation of basic technology in junior secondary schools. The government will provide the necessary facilities for implementation of the basic technology in junior secondary schools. Teachers of technology will improve themselves for the successful implementation of the new basic technology curriculum.

**Conclusion**

Based on the findings of the study, the following conclusions were drawn:

Basic technology is an integrated subject in the curriculum of junior secondary schools where students are supposed to acquire basic knowledge, skills and attitudes about technologies. In order to improve the achievement of students in basic technology, teachers are expected to be competent in teaching the content areas of the basic technology curriculum. But observation revealed that fifty percent of the students who sat for junior WAEC failed in basic technology in 2010 and 2011. The failure of students in basic technology has been attributed to incompetence of teachers of introductory technology now implementing the new basic technology curriculum. It is in this direction that the study now set up to determine competency improvement needs of introductory technology teachers to enhance the implementation of basic technology in Kogi State. It was then revealed that teachers of technology need improvement for effective implementation of basic technology in junior secondary schools in Kogi State

**Recommendations**

Based on the findings of the study, the following recommendations were made:

1. Workshop and seminars should be organized for the teachers of technology in order to build their capacity for the implementation of the basic technology in junior secondary schools in Kogi State.
2. Teachers of technology should be retrained based on areas of needs identified in the study.
3. Relevant facilities for effective implementation of the basic technology should be provided by government and other enabling bodies.

**Suggestion for Further Study**

The following are suggested for further studies:

1. Competency improvement needs of technology teachers for effective implementation of basic technology in other states.
2. Material resource inputs required for the effective implementation of basic technology in Kogi State.

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**APPENDIX II**

**QUESTIONNAIRE FOR TEACHERS OF BASIC TECHNOLOGY**

**Competency Improvement Needs of Technology Teachers in the Implementation of Basic**

**Technology in Kogi State**

**Personal Data**

Please check (√) the appropriate response that is most applicable to you. Teachers of Basic Technology in Public Schools 

Teachers of Basic Technology in Private Schools

Please, indicate by checking (√) in the appropriate column in the level of performance Scale (To

be completed by teachers of basic technology)

|  |  |  |
| --- | --- | --- |
| High Performance | - | HP |
| Moderate Performance | - | MP |
| Low performance | - | LP |
| No Performance | - | NP |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Section I**: | | | competency improvement needs of teachers of technology in instructional | | | | | | | |
| techniques | | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | **S/N** |  | **Competency items** |  |  | **Level of Performance** | | | |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **HP** |  | **MP** | **LP** | **NP** |  |
|  | **A.** |  | **Planning Instruction in Basic Technology** | |  |  |  |  |  |  |
|  | 1 |  | Stating the behavioral objectives |  |  |  |  |  |  |  |
|  | 2 |  | Stating the previous knowledge |  |  |  |  |  |  |  |
|  | 3 |  | Determining instructional materials | |  |  |  |  |  |  |
|  | 4 |  | Organizing instructional materials | |  |  |  |  |  |  |
|  | **B.** |  | **Implementing Instructions** | **in Basic** |  |  |  |  |  |  |
|  |  |  | **Technology** |  |  |  |  |  |  |  |
|  | 5 |  | Introduce the lesson through the use of any | |  |  |  |  |  |  |
|  |  |  | appropriate teaching methods |  |  |  |  |  |  |  |
|  | 6 |  | Organizing sequentially the | instructional |  |  |  |  |  |  |
|  |  |  | materials |  |  |  |  |  |  |  |
|  | **7** |  | Use of relevant teaching aids |  |  |  |  |  |  |  |
|  | 8 |  | Reinforcing learning activities |  |  |  |  |  |  |  |
|  | 9 |  | Directing classroom instruction |  |  |  |  |  |  |  |
|  | 10 |  | Employing varieties of teaching method | |  |  |  |  |  |  |
|  | 11 |  | Involving ICT in teaching basic technology | |  |  |  |  |  |  |
|  | **C.** |  | **Evaluating Instructional process** | |  |  |  |  |  |  |
|  | 12 |  | Evaluating the quality of instruction | |  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 13 | Evaluating performance of students through |  |  |  |  |
|  | demonstration of test |  |  |  |  |
| 14 | Applying appropriate evaluation techniques |  |  |  |  |
| 15 | Involving students in evaluating one another |  |  |  |  |
| 16 | Developing test and rating sheet |  |  |  |  |
| 17 | Administering and analyzing test |  |  |  |  |

**Section II:** Competency improvement needs of teachers of technology in teaching thecontent of basic technology curriculum to students in junior secondary schools

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** |  | **Competency items** | | |  | **Level of Performance** | | | |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **HP** |  | **MP** | **LP** | **NP** |
| **A.** | **Technology:** | |  |  |  |  |  |  |  |
| 1 | Concept of technology | | |  |  |  |  |  |  |
| 2 | Products of technology | | |  |  |  |  |  |  |
| 3. | Life application of technology | | | |  |  |  |  |  |
| 4. | Need for technological literacy and | | | |  |  |  |  |  |
|  | capability for all as life coping skills | | | |  |  |  |  |  |
| **B.** | **Workshop Safety:** | | |  |  |  |  |  |  |
| 5 | Causes of workshop accidents | | | |  |  |  |  |  |
| 6 | Accident prevention techniques | | | |  |  |  |  |  |
| 7 | Safety rules and regulations | | |  |  |  |  |  |  |
| 8. | Type of fire and their control | | | |  |  |  |  |  |
| **C.** | **Scales and scale Drawing:** | | |  |  |  |  |  |  |
| 9. | Reading graduation on the metric rule | | | |  |  |  |  |  |
| 10. | Measuring and comparing given sizes | | | |  |  |  |  |  |
| 11 | Scale drawing and types of scale | | | |  |  |  |  |  |
| 12. | Reduction and enlargement of scales | | | |  |  |  |  |  |
| D. | Basic Electronic Devices: | | |  |  |  |  |  |  |
| 13. | Electronic devices and their uses | | | |  |  |  |  |  |
| 14 | Emission theory | |  |  |  |  |  |  |  |
| 15 | Principles of operation of the devices | | | |  |  |  |  |  |
| **E** | **Information** | | **and** | **Communication** |  |  |  |  |  |
|  | **Technology:** | |  |  |  |  |  |  |  |
| 16. | Analogue | and | digital | communication |  |  |  |  |  |
|  | systems |  |  |  |  |  |  |  |  |
| 17 | Meaning and nature of ICT process | | | |  |  |  |  |  |
| 18 | Schematic diagram of GSM transmission | | | |  |  |  |  |  |
|  | process |  |  |  |  |  |  |  |  |
| 19 | Internet and its process | | |  |  |  |  |  |  |
| 20 | Internet equipment and transmission process | | | |  |  |  |  |  |
| **F** | **Energy Based Technological Appliances:** | | | |  |  |  |  |  |
| 21 | Principles | of | operation | various home |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | appliances |  |  |  |  |
| 22 | Principles of evaporation leading to cooling |  |  |  |  |
|  | by refrigerants |  |  |  |  |
| 23 | Principles of operation electric fan grinder |  |  |  |  |
| 24 | Working principles of generators, bicycles |  |  |  |  |
|  | and dynamos. |  |  |  |  |
| **G** | **Gears:** |  |  |  |  |
| 25 | Gears and gearing and related calculations |  |  |  |  |
| 26 | Internal, external and bevel gears |  |  |  |  |
| 27 | Uses and applications of gears |  |  |  |  |
| 28 | Gear ratio and speed ratios |  |  |  |  |
| 29 | Friction between meshing gears and |  |  |  |  |
|  | functions of lubricants. |  |  |  |  |

**Section III:** Competency improvement needs of teachers of technology inclassroom/laboratory management for the implementation of basic technology

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Competency Items** |  | **Level of Performance** | | | |
|  |  |  |  |  |  |  |
|  |  | **HP** |  | **MP** | **LP** | **NP** |
| **A** | **Planning** |  |  |  |  |  |
| 1 | Make available tools and equipment to be |  |  |  |  |  |
|  | used |  |  |  |  |  |
| 2 | Make the tools and equipment in good |  |  |  |  |  |
|  | condition |  |  |  |  |  |
| 3 | Arrange facilities in order of the needs for |  |  |  |  |  |
|  | instruction |  |  |  |  |  |
| 4 | Arrange classroom setting to accommodate |  |  |  |  |  |
|  | various instructional activities |  |  |  |  |  |
| 5 | Provide safety poster in the laboratory to |  |  |  |  |  |
|  | encourage correct safety habit in sequence |  |  |  |  |  |
|  | and logical order |  |  |  |  |  |
| 6 | Arrange benches and machines properly to |  |  |  |  |  |
|  | facilitate learning |  |  |  |  |  |
| **B** | **Coordinating** |  |  |  |  |  |
| 7 | Check attendance for each student daily |  |  |  |  |  |
| 8 | Supervise students activities in classroom/ |  |  |  |  |  |
|  | laboratory |  |  |  |  |  |
| 9 | Apply corrective measures to enhance |  |  |  |  |  |
|  | discipline in the classroom / laboratory |  |  |  |  |  |
| 10 | Organize routine cleaning procedure for the |  |  |  |  |  |
|  | laboratory facilities |  |  |  |  |  |
| 11 | Assign leaders among students to coordinate |  |  |  |  |  |
|  | activities among themselves |  |  |  |  |  |

**C** **Evaluation**

1. Check for the appropriateness of workshop facilities
2. Assess the effectiveness of instruction in the workshop through students practical test
3. Check laboratory tools and equipment after use

**Section IV:** Competency improvement needs of teachers of technology in using teachingmethods and techniques for the implementation of basic technology

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **Competency Items** | **Level of Performance** | | | |
|  |  |  |  |  |  |
|  |  | **HP** | **MP** | **LP** | **NP** |
| 1 | Group the students in a large class for |  |  |  |  |
|  | demonstration process |  |  |  |  |
| 2 | Present information with projector |  |  |  |  |
| 3 | Presentconceptsandskillsbefore |  |  |  |  |
|  | demonstration commence |  |  |  |  |
| 4. | Involve the students in all activities during |  |  |  |  |
|  | learning process |  |  |  |  |
| 5. | Use appropriate teaching methods as |  |  |  |  |
|  | demonstration method |  |  |  |  |
| 6. | Perform the learning process during |  |  |  |  |
|  | demonstration before the students |  |  |  |  |
| 7 | Employ team teaching during demonstration |  |  |  |  |
| 8 | Visit students while performing their tasks |  |  |  |  |
| 9 | Make demonstration work and activities to |  |  |  |  |
|  | be meaningful to the learners |  |  |  |  |

**Section V:** Competency improvement needs of teachers of technology in evaluationtechniques for the implementation of basic technology

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Competency Items** |  | **Level of Performance** | | | |
|  |  |  |  |  |  |  |
|  |  | **HP** |  | **MP** | **NP** | **NP** |
| 1 | Evaluate students affective domain |  |  |  |  |  |
| 2 | Assess students psychomotor performance |  |  |  |  |  |
| 3 | Construct reliable test to evaluate students |  |  |  |  |  |
|  | progress |  |  |  |  |  |
| 4 | Assess the effectiveness of the teaching |  |  |  |  |  |
|  | strategy |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 5 | Make record about students academic ability |  |  |  |  |
| 6 | Provide records about students moral |  |  |  |  |
|  | character and personality |  |  |  |  |
| 7 | Make use of information procedure like |  |  |  |  |
|  | observation for collection of information |  |  |  |  |
|  | about students |  |  |  |  |
| 8 | Use varieties of evaluation techniques and |  |  |  |  |
|  | procedures such as test assessment and |  |  |  |  |
|  | project |  |  |  |  |
| 9 | Give test periodically to monitor learning |  |  |  |  |
|  | process during instruction |  |  |  |  |
| 10 | Evaluate the students learning difficulties |  |  |  |  |
|  | during instruction |  |  |  |  |
| 11 | Use the evaluation records available to |  |  |  |  |
|  | determine the level of academic attainment |  |  |  |  |
|  | by students |  |  |  |  |

**APPENDIX III**

**Questionnaire for Lecturers in the Schools of Technical Education of Colleges of Education in Kogi State**

**Competency Improvement Needs Technology Teachers to Enhance the Implementation of Basic Technology in Kogi State**

Personal Data

Please check (√) the appropriate response that is most applicable to you.

Supervisors of Basic Technology

Please, indicate by checking (√) in the appropriate column in the level of needed

|  |  |  |
| --- | --- | --- |
| Highly Needed | - | HN |
| Needed | - | N |
| Moderately Needed | - | MN |
| Not Needed | - | NN |

**Section I**: competency improvement needs of teachers of technology in instruction forthe implementation of basic technology

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Competency Items** | |  |  |  | **Level of Needed** | | | | |
|  |  |  |  |  | **HN** |  | **N** | **MN** | **NN** |  |
| **A.** | Planning instruction in Basic Technology | | | |  |  |  |  |  |  |
| 1 | Structuring a course | |  |  |  |  |  |  |  |  |
| 2 | Designing a unit |  |  |  |  |  |  |  |  |  |
| 3. | Selecting instructional resources | |  |  |  |  |  |  |  |  |
| 4. | Developing instructional materials | | |  |  |  |  |  |  |  |
| 5. | Planning a lesson |  |  |  |  |  |  |  |  |  |
| **B.** | Implementing | Instructions | in | Basic |  |  |  |  |  |  |
|  | Technology |  |  |  |  |  |  |  |  |  |
| 6 | Directing student’s projects | |  |  |  |  |  |  |  |  |
| 7 | Reinforcing learning | |  |  |  |  |  |  |  |  |
| 8. | Directing classroom instruction | |  |  |  |  |  |  |  |  |
| 9. | Employing varieties of teaching method | | | |  |  |  |  |  |  |
| 10. | Involving ICT in teaching basic technology | | | |  |  |  |  |  |  |
| 11. | Employing reciprocal peer tutoring in | | | |  |  |  |  |  |  |
|  | teaching basic technology | |  |  |  |  |  |  |  |  |
| **C.** | Evaluating Instructions in Basic Technology | | | |  |  |  |  |  |  |
| 13. | Evaluating quality of instruction | |  |  |  |  |  |  |  |  |
| 15. | Evaluating performance of students in basic | | | |  |  |  |  |  |  |
|  | technology practical | |  |  |  |  |  |  |  |  |
| 16. | Applying appropriate evaluation techniques | | | |  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 17 | Involving students in evaluation |  |  |  |  |
| 18 | Developing test and rating sheet |  |  |  |  |
| 20 | Administering and analyzing test |  |  |  |  |
| **D.** | Program Management in Basic Technology |  |  |  |  |
| 21 | Projecting instructional resource needs of |  |  |  |  |
|  | basic technology in the school |  |  |  |  |
| 22 | Preparing annual budget for practical |  |  |  |  |
|  | activities |  |  |  |  |
| 23 | Procuring supplies and facilities for basic |  |  |  |  |
|  | technology |  |  |  |  |
| 24 | Maintaining records and files for practical |  |  |  |  |
|  | activities in basic technology |  |  |  |  |
| 25 | Providing for safety of students in the |  |  |  |  |
|  | workshop |  |  |  |  |
| 26 | Managing the basic technology tools, |  |  |  |  |
|  | equipment and machines. |  |  |  |  |

**Section II:** Competency improvement needs of teachers of technology in teaching thecontent of basic technology curriculum to students in junior secondary schools

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Competency items** |  | **Level of Needed** | | | | |
|  |  | **HN** |  | **N** | **MN** | **NN** |  |
| **A.** | **Technology:** |  |  |  |  |  |  |
| 1 | Concept of technology |  |  |  |  |  |  |
| 2 | Products of technology |  |  |  |  |  |  |
| 3. | Life application of technology |  |  |  |  |  |  |
| 4. | Need for technological literacy and |  |  |  |  |  |  |
|  | capability for all as life coping skills |  |  |  |  |  |  |
| **B.** | **Workshop Safety:** |  |  |  |  |  |  |
| 5 | Causes of workshop accidents |  |  |  |  |  |  |
| 6 | Accident prevention techniques |  |  |  |  |  |  |
| 7 | Safety rules and regulations |  |  |  |  |  |  |
| 8. | Type of fire and their control |  |  |  |  |  |  |
| **C.** | **Scales and scale Drawing:** |  |  |  |  |  |  |
| 9. | Reading graduation on the metric rule |  |  |  |  |  |  |
| 10. | Measuring and comparing given sizes |  |  |  |  |  |  |
| 11 | Scale drawing and types of scale |  |  |  |  |  |  |
| 12. | Reduction and enlargement of scales |  |  |  |  |  |  |
| D. | Basic Electronic Devices: |  |  |  |  |  |  |
| 13. | Electronic devices and their uses |  |  |  |  |  |  |
| 14 | Emission theory |  |  |  |  |  |  |
| 15 | Principles of operation of the devices |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **E** | **Information** | **and** | **Communication** |
|  | **Technology:** |  |  |
| 16. | Analogue and | digital | communication |
|  | systems |  |  |
| 17 | Meaning and nature of ICT process | | |
| 18 | Schematic diagram of GSM transmission | | |
|  | process |  |  |
| 19 | Internet and its process | |  |
| 20 | Internet equipment and transmission process | | |

|  |  |
| --- | --- |
| **F** | **Energy Based Technological Appliances:** |
| 21 | Principles of operation various home |
|  | appliances |
| 22 | Principles of evaporation leading to cooling |
|  | by refrigerants |
| 23 | Principles of operation electric fan grinder |
| 24 | Working principles of generators, bicycles |
|  | and dynamos. |

|  |  |
| --- | --- |
| **G** | **Gears:** |
| 25 | Gears and gearing and related calculations |
| 26 | Internal, external and bevel gears |
| 27 | Uses and applications of gears |
| 28 | Gear ratio and speed ratios |
| 29 | Friction between meshing gears and |
|  | functions of lubricants. |

**Section III:** Competency improvement needs of teachers of technology inclassroom/laboratory management for the implementation of basic technology

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Competency Items** |  | **Level of Needed** | | | | |
|  |  |  |  |  |  |  |  |
|  |  | **HN** |  | **N** | **MN** | **NN** |  |
| 1 | Make effective use of classroom for teaching |  |  |  |  |  |  |
|  | and learning of basic technology |  |  |  |  |  |  |
| 2 | Arrange classroom setting to accommodate |  |  |  |  |  |  |
|  | various instructional activities |  |  |  |  |  |  |
| 3 | Check attendance for each class daily |  |  |  |  |  |  |
| 4. | Arrange machines between in sequential |  |  |  |  |  |  |
|  | order in the laboratory to allow effective use |  |  |  |  |  |  |
| 5. | Maintain common tools and machines used |  |  |  |  |  |  |
|  | in the laboratory |  |  |  |  |  |  |
| 6. | Provide safety poster in the laboratory to |  |  |  |  |  |  |
|  | encourage correct safety habit |  |  |  |  |  |  |
| 7 | Establish and maintain students progress |  |  |  |  |  |  |
|  | records |  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 8 | Arrange benches, machines in the laboratory |  |  |  |  |
|  | in sequential and logical order to allow flow |  |  |  |  |
|  | of students and materials. |  |  |  |  |
| 9 | Provide for the safety first aid needs of the |  |  |  |  |
|  | students |  |  |  |  |
| 10. | Apply corrective measures to enhance |  |  |  |  |
|  | discipline in the classroom / laboratory |  |  |  |  |
| 11 | Allocate time realistically |  |  |  |  |
| 12 | Actively supervise activities of students in |  |  |  |  |
|  | the classroom/laboratory |  |  |  |  |
| 13. | Organize an effective routine cleaning |  |  |  |  |
|  | procedure for the laboratory. |  |  |  |  |
| 14 | Reorganize the need for adequate ventilation |  |  |  |  |
|  | in the classroom. |  |  |  |  |

**Section IV:** Competency improvement needs of teachers of technology in using teachingmethods and techniques for the implementation of basic technology

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Competency Items** |  | **Level of Needed** | | | |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  | **HN** |  | **N** | **MN** |  | **NN** |  |
| 1 | Use appropriate teaching methods i.e. |  |  |  |  |  |  |  |
|  | demonstration, lecture, project etc. |  |  |  |  |  |  |  |
| 2 | Involve the students as much as possible by |  |  |  |  |  |  |  |
|  | asking question which provoke critical |  |  |  |  |  |  |  |
|  | thinking |  |  |  |  |  |  |  |
| 3 | Present a concept or skill demonstration |  |  |  |  |  |  |  |
|  | before the students |  |  |  |  |  |  |  |
| 4. | Demonstrate problem solving solution which |  |  |  |  |  |  |  |
|  | allows students to develop creative activities |  |  |  |  |  |  |  |
| 5. | Present information with projector |  |  |  |  |  |  |  |
| 6. | Employ team teaching techniques |  |  |  |  |  |  |  |
| 7 | Make connections logical accurate and |  |  |  |  |  |  |  |
|  | meaningful to learners |  |  |  |  |  |  |  |
| 8 | Direct individual learners progress and |  |  |  |  |  |  |  |
|  | performance more consistently |  |  |  |  |  |  |  |
| 9 | Use appropriate teaching methods i.e. |  |  |  |  |  |  |  |
|  | demonstration, lecture, project etc. |  |  |  |  |  |  |  |

**Section V:** Competency improvement needs of teachers of technology in evaluationtechniques for the implementation of basic technology

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Competency Items** |  | **Level of Needed** | | | |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  | **HN** |  | **N** | **MN** |  | **NN** |  |
| 1 | Give tests that are related to what the |  |  |  |  |  |  |  |
|  | students were taught in the classroom |  |  |  |  |  |  |  |
| 2 | Evaluate students effective performance |  |  |  |  |  |  |  |
| 3 | Assess students psychomotor performance |  |  |  |  |  |  |  |
| 4. | Assess the relevant student behaviour |  |  |  |  |  |  |  |
| 5. | Construct reliable test to evaluate students |  |  |  |  |  |  |  |
|  | progress |  |  |  |  |  |  |  |
| 6. | Assess the effectiveness of the teaching |  |  |  |  |  |  |  |
|  | strategy |  |  |  |  |  |  |  |
| 7 | Make record about students academic ability, |  |  |  |  |  |  |  |
|  | moral character and personality |  |  |  |  |  |  |  |
| 8 | Make use of information procedure like |  |  |  |  |  |  |  |
|  | observation for collection of information |  |  |  |  |  |  |  |
|  | about students |  |  |  |  |  |  |  |
| 9 | Use varieties of evaluation techniques and |  |  |  |  |  |  |  |
|  | procedures i.e. test assessment and project |  |  |  |  |  |  |  |
| 10 | Give test periodically to monitor learning |  |  |  |  |  |  |  |
|  | process during instruction |  |  |  |  |  |  |  |
| 11 | Evaluate the students learning difficulties |  |  |  |  |  |  |  |
|  | during instruction |  |  |  |  |  |  |  |

**APPENDIX IV**

**RESULT OF THE ANALYSIS**

**HYPOTHESIS 1**

**Group Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | STATUS | N | Mean | Std. Deviation | Std. Error Mean |
|  |  |  |  |  |  |
| ITEMA1 | TEACHER | 317 | 3.2700 | .76112 | .04944 |
|  | SUPERVISOR | 14 | 3.5000 | .85485 | .22847 |
|  |  |  |  |  |  |
| ITEMA2 | TEACHER | 317 | 3.2996 | .75276 | .04890 |
|  | SUPERVISOR | 14 | 3.3571 | .63332 | .16926 |
|  |  |  |  |  |  |
| ITEMA3 | TEACHER | 317 | 3.2700 | .71520 | .04646 |
|  | SUPERVISOR | 14 | 3.4286 | .64621 | .17271 |
|  |  |  |  |  |  |
| ITEMA4 | TEACHER | 317 | 3.2827 | .67038 | .04355 |
|  | SUPERVISOR | 14 | 3.3571 | .74495 | .19910 |
|  |  |  |  |  |  |
| ITEMA5 | TEACHER | 317 | 3.0675 | .83087 | .05397 |
|  | SUPERVISOR | 14 | 3.0714 | .91687 | .24505 |
|  |  |  |  |  |  |
| ITEMA6 | TEACHER | 317 | 3.1266 | .74277 | .04825 |
|  | SUPERVISOR | 14 | 3.2143 | .69929 | .18689 |
|  |  |  |  |  |  |
| ITEMA7 | TEACHER | 317 | 3.2278 | .76384 | .04962 |
|  | SUPERVISOR | 14 | 3.4286 | .75593 | .20203 |
|  |  |  |  |  |  |
| ITEMA8 | TEACHER | 317 | 3.3038 | .73105 | .04749 |
|  | SUPERVISOR | 14 | 3.5000 | .75955 | .20300 |
|  |  |  |  |  |  |
| ITEMA9 | TEACHER | 317 | 3.2405 | .68051 | .04420 |
|  | SUPERVISOR | 14 | 3.3571 | .63332 | .16926 |
|  |  |  |  |  |  |
| ITEMA10 | TEACHER | 317 | 3.2658 | .74860 | .04863 |
|  | SUPERVISOR | 14 | 3.4286 | .85163 | .22761 |
|  |  |  |  |  |  |
| ITEMA11 | TEACHER | 317 | 3.1688 | .74575 | .04844 |
|  | SUPERVISOR | 14 | 3.1429 | .94926 | .25370 |
|  |  |  |  |  |  |
| ITEMA12 | TEACHER | 317 | 3.1181 | .81483 | .05293 |
|  | SUPERVISOR | 14 | 3.2143 | 1.05090 | .28087 |
|  |  |  |  |  |  |
| ITEMA13 | TEACHER | 317 | 3.0591 | .76239 | .04952 |
|  | SUPERVISOR | 14 | 3.2857 | .82542 | .22060 |
|  |  |  |  |  |  |
| ITEMA14 | TEACHER | 317 | 2.8523 | .70058 | .04551 |
|  | SUPERVISOR | 14 | 2.7857 | .57893 | .15473 |
|  |  |  |  |  |  |
| ITEMA15 | TEACHER | 317 | 2.9536 | .76604 | .04976 |
|  | SUPERVISOR | 14 | 2.8571 | .86444 | .23103 |
|  |  |  |  |  |  |
| ITEMA16 | TEACHER | 317 | 2.8903 | .77336 | .05024 |
|  | SUPERVISOR | 14 | 3.0000 | .67937 | .18157 |
|  |  |  |  |  |  |
| ITEMA17 | TEACHER | 317 | 2.7890 | .86713 | .05633 |
|  | SUPERVISOR | 14 | 2.9286 | .73005 | .19511 |
|  |  |  |  |  |  |

**Independent Samples Test**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Levene's Test for | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  | Equality of | |  |  |  |  |  |  |  |
|  |  | Variances | |  |  | t-test for Equality of Means | | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  | 95% Confidence | |
|  |  |  |  |  |  |  | Mean | Std. Error | Interval of the | |
|  |  |  |  |  |  |  | Difference | |
|  |  |  |  |  |  | Sig. (2- | Differenc | Differenc |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | F | Sig. | t | df | tailed) | e | e | Lower | Upper |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA1 | Equal variances assumed | .029 | .865 | -1.091 | 249 | .276 | -.22996 | .21076 | -.64507 | .18515 |
|  | Equal variances not assumed |  |  | -.984 | 14.244 | .342 | -.22996 | .23376 | -.73051 | .27059 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA2 | Equal variances assumed | .451 | .503 | -.280 | 249 | .780 | -.05756 | .20546 | -.46222 | .34709 |
|  | Equal variances not assumed |  |  | -.327 | 15.254 | .748 | -.05756 | .17618 | -.43255 | .31742 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA3 | Equal variances assumed | .005 | .946 | -.810 | 249 | .419 | -.15853 | .19577 | -.54410 | .22704 |
|  | Equal variances not assumed |  |  | -.886 | 14.945 | .389 | -.15853 | .17885 | -.53985 | .22279 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA4 | Equal variances assumed | .584 | .446 | -.401 | 249 | .689 | -.07444 | .18551 | -.43981 | .29092 |
|  | Equal variances not assumed |  |  | -.365 | 14.272 | .720 | -.07444 | .20380 | -.51077 | .36189 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA5 | Equal variances assumed | .103 | .749 | -.017 | 249 | .986 | -.00392 | .22982 | -.45655 | .44872 |
|  | Equal variances not assumed |  |  | -.016 | 14.290 | .988 | -.00392 | .25092 | -.54106 | .53323 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA6 | Equal variances assumed | .028 | .867 | -.431 | 249 | .667 | -.08770 | .20369 | -.48887 | .31346 |
|  | Equal variances not assumed |  |  | -.454 | 14.787 | .656 | -.08770 | .19302 | -.49964 | .32423 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA7 | Equal variances assumed | .054 | .817 | -.956 | 249 | .340 | -.20072 | .20998 | -.61428 | .21283 |
|  | Equal variances not assumed |  |  | -.965 | 14.613 | .350 | -.20072 | .20803 | -.64516 | .24372 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA8 | Equal variances assumed | .059 | .808 | -.974 | 249 | .331 | -.19620 | .20149 | -.59304 | .20063 |
|  | Equal variances not assumed |  |  | -.941 | 14.459 | .362 | -.19620 | .20848 | -.64202 | .24961 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA9 | Equal variances assumed | .000 | .999 | -.625 | 249 | .532 | -.11664 | .18651 | -.48398 | .25071 |
|  | Equal variances not assumed |  |  | -.667 | 14.830 | .515 | -.11664 | .17494 | -.48988 | .25661 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA10 | Equal variances assumed | .057 | .811 | -.784 | 249 | .434 | -.16275 | .20747 | -.57137 | .24587 |
|  | Equal variances not assumed |  |  | -.699 | 14.212 | .496 | -.16275 | .23274 | -.66124 | .33574 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA11 | Equal variances assumed | 1.311 | .253 | .124 | 249 | .901 | .02592 | .20841 | -.38454 | .43638 |
|  | Equal variances not assumed |  |  | .100 | 13.964 | .921 | .02592 | .25828 | -.52818 | .58002 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA12 | Equal variances assumed | 3.729 | .055 | -.422 | 249 | .674 | -.09614 | .22796 | -.54512 | .35283 |
|  | Equal variances not assumed |  |  | -.336 | 13.939 | .742 | -.09614 | .28581 | -.70939 | .51711 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA13 | Equal variances assumed | .392 | .532 | -1.076 | 249 | .283 | -.22664 | .21063 | -.64149 | .18820 |
|  | Equal variances not assumed |  |  | -1.002 | 14.341 | .333 | -.22664 | .22609 | -.71048 | .25720 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA14 | Equal variances assumed | .121 | .728 | .349 | 249 | .728 | .06661 | .19109 | -.30975 | .44296 |
|  | Equal variances not assumed |  |  | .413 | 15.340 | .685 | .06661 | .16128 | -.27649 | .40970 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA15 | Equal variances assumed | .479 | .490 | .455 | 249 | .650 | .09644 | .21219 | -.32148 | .51436 |
|  | Equal variances not assumed |  |  | .408 | 14.232 | .689 | .09644 | .23633 | -.40966 | .60254 |
|  |  |  |  |  |  |  |  |  |  |  |
| ITEMA16 | Equal variances assumed | 1.150 | .285 | -.519 | 249 | .604 | -.10970 | .21143 | -.52613 | .30672 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Equal variances not assumed |  |  | -.582 |  | 15.062 |  | .569 |  | -.10970 |  | .18839 |  | -.51110 |  | .29170 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMA17 | Equal variances assumed | 1.866 | .173 | -.590 |  | 249 |  | .556 |  | -.13954 |  | .23668 |  | -.60569 |  | .32660 |
|  | Equal variances not assumed |  |  | -.687 |  | 15.251 |  | .502 |  | -.13954 |  | .20308 |  | -.57178 |  | .29269 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**HYPOTHESIS 2**

**Group Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | STATUS | N | Mean | Std. Deviation | Std. Error Mean |
|  |  |  |  |  |  |
| ITEMB1 | TEACHER | 317 | 2.8945 | .91217 | .05925 |
|  | SUPERVISOR | 14 | 2.7143 | .82542 | .22060 |
|  |  |  |  |  |  |
| ITEMB2 | TEACHER | 317 | 3.1013 | .79076 | .05137 |
|  | SUPERVISOR | 14 | 3.2143 | .80178 | .21429 |
|  |  |  |  |  |  |
| ITEMB3 | TEACHER | 317 | 3.0084 | .85366 | .05545 |
|  | SUPERVISOR | 14 | 2.7857 | .89258 | .23855 |
|  |  |  |  |  |  |
| ITEMB4 | TEACHER | 317 | 3.1772 | .65275 | .04240 |
|  | SUPERVISOR | 14 | 3.0714 | .47463 | .12685 |
|  |  |  |  |  |  |
| ITEMB5 | TEACHER | 317 | 3.1941 | .77315 | .05022 |
|  | SUPERVISOR | 14 | 2.9286 | .99725 | .26653 |
|  |  |  |  |  |  |
| ITEMB6 | TEACHER | 317 | 3.0591 | .69859 | .04538 |
|  | SUPERVISOR | 14 | 2.7857 | .69929 | .18689 |
|  |  |  |  |  |  |
| ITEMB7 | TEACHER | 317 | 3.0084 | .83864 | .05448 |
|  | SUPERVISOR | 14 | 3.2143 | .42582 | .11380 |
|  |  |  |  |  |  |
| ITEMB8 | TEACHER | 317 | 2.7553 | .85322 | .05542 |
|  | SUPERVISOR | 14 | 2.7857 | .80178 | .21429 |
|  |  |  |  |  |  |
| ITEMB9 | TEACHER | 317 | 2.9831 | .74200 | .04820 |
|  | SUPERVISOR | 14 | 3.0714 | .73005 | .19511 |
|  |  |  |  |  |  |
| ITEMB10 | TEACHER | 317 | 2.8903 | .77882 | .05059 |
|  | SUPERVISOR | 14 | 2.7857 | .57893 | .15473 |
|  |  |  |  |  |  |
| ITEMB11 | TEACHER | 317 | 3.0084 | .75908 | .04931 |
|  | SUPERVISOR | 14 | 3.0000 | .67937 | .18157 |
|  |  |  |  |  |  |
| ITEMB12 | TEACHER | 317 | 3.1730 | .85348 | .05544 |
|  | SUPERVISOR | 14 | 3.0000 | .96077 | .25678 |
|  |  |  |  |  |  |
| ITEMB13 | TEACHER | 317 | 3.3671 | .80006 | .05197 |
|  | SUPERVISOR | 14 | 3.2143 | .89258 | .23855 |
|  |  |  |  |  |  |
| ITEMB14 | TEACHER | 317 | 3.4430 | .74356 | .04830 |
|  | SUPERVISOR | 14 | 3.5000 | .65044 | .17384 |
|  |  |  |  |  |  |
| ITEMB15 | TEACHER | 317 | 3.3038 | .82371 | .05351 |
|  | SUPERVISOR | 14 | 3.5714 | .64621 | .17271 |
|  |  |  |  |  |  |
| ITEMB16 | TEACHER | 317 | 3.4515 | .70318 | .04568 |
|  | SUPERVISOR | 14 | 3.5714 | .51355 | .13725 |
|  |  |  |  |  |  |
| ITEMB17 | TEACHER | 317 | 3.3291 | .78743 | .05115 |
|  | SUPERVISOR | 14 | 3.5000 | .51887 | .13868 |
|  |  |  |  |  |  |
| ITEMB18 | TEACHER | 317 | 3.4008 | .73335 | .04764 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | SUPERVISOR |  | 14 |  | 3.5714 |  | .51355 |  | .13725 |
|  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB19 | TEACHER |  | 317 |  | 3.2785 |  | .88207 |  | .05730 |
|  | SUPERVISOR |  | 14 |  | 3.6429 |  | .49725 |  | .13289 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB20 | TEACHER |  | 317 |  | 3.4430 |  | .76602 |  | .04976 |
|  | SUPERVISOR |  | 14 |  | 3.7143 |  | .61125 |  | .16336 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB21 | TEACHER |  | 317 |  | 3.5443 |  | .65349 |  | .04245 |
|  | SUPERVISOR |  | 14 |  | 3.5714 |  | .64621 |  | .17271 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB22 | TEACHER |  | 317 |  | 3.3080 |  | .78792 |  | .05118 |
|  | SUPERVISOR |  | 14 |  | 3.5714 |  | .64621 |  | .17271 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB23 | TEACHER |  | 317 |  | 3.2869 |  | .74359 |  | .04830 |
|  | SUPERVISOR |  | 14 |  | 3.3571 |  | .63332 |  | .16926 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB24 | TEACHER |  | 317 |  | 3.3122 |  | .81014 |  | .05262 |
|  | SUPERVISOR |  | 14 |  | 3.2857 |  | .72627 |  | .19410 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB25 | TEACHER |  | 317 |  | 3.1392 |  | .83971 |  | .05454 |
|  | SUPERVISOR |  | 14 |  | 3.2143 |  | .57893 |  | .15473 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB26 | TEACHER |  | 317 |  | 3.1139 |  | .86828 |  | .05640 |
|  | SUPERVISOR |  | 14 |  | 3.0714 |  | .61573 |  | .16456 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB27 | TEACHER |  | 317 |  | 3.0928 |  | .82328 |  | .05348 |
|  | SUPERVISOR |  | 14 |  | 3.3571 |  | .49725 |  | .13289 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB28 | TEACHER |  | 317 |  | 3.0675 |  | .70986 |  | .04611 |
|  | SUPERVISOR |  | 14 |  | 3.0714 |  | .47463 |  | .12685 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB29 | TEACHER |  | 317 |  | 3.0633 |  | .82865 |  | .05383 |
|  | SUPERVISOR |  | 14 |  | 3.0000 |  | .67937 |  | .18157 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB30 | TEACHER |  | 317 |  | 2.9662 |  | .78581 |  | .05104 |
|  | SUPERVISOR |  | 14 |  | 2.8571 |  | .77033 |  | .20588 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB31 | TEACHER |  | 317 |  | 2.7637 |  | .82021 |  | .05328 |
|  | SUPERVISOR |  | 14 |  | 2.4286 |  | .85163 |  | .22761 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB32 | TEACHER |  | 317 |  | 2.8228 |  | .83503 |  | .05424 |
|  | SUPERVISOR |  | 14 |  | 2.7143 |  | .82542 |  | .22060 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB33 | TEACHER |  | 317 |  | 2.7890 |  | .74062 |  | .04811 |
|  | SUPERVISOR |  | 14 |  | 2.6429 |  | .84190 |  | .22501 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB34 | TEACHER |  | 317 |  | 2.9916 |  | .83357 |  | .05415 |
|  | SUPERVISOR |  | 14 |  | 2.7857 |  | .69929 |  | .18689 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB35 | TEACHER |  | 317 |  | 2.9916 |  | .66378 |  | .04312 |
|  | SUPERVISOR |  | 14 |  | 2.8571 |  | .66299 |  | .17719 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB36 | TEACHER |  | 317 |  | 3.0591 |  | .84164 |  | .05467 |
|  | SUPERVISOR |  | 14 |  | 3.1429 |  | .53452 |  | .14286 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB37 | TEACHER |  | 317 |  | 3.0844 |  | .81384 |  | .05286 |
|  | SUPERVISOR |  | 14 |  | 2.9286 |  | .82874 |  | .22149 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB38 | TEACHER |  | 317 |  | 3.0717 |  | .78595 |  | .05105 |
|  | SUPERVISOR |  | 14 |  | 3.1429 |  | .77033 |  | .20588 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB39 | TEACHER |  | 317 |  | 2.9072 |  | .88288 |  | .05735 |
|  | SUPERVISOR |  | 14 |  | 3.0000 |  | .78446 |  | .20966 |
|  |  |  |  |  |  |  |  |  |  |
| ITEMB40 | TEACHER |  | 317 |  | 3.0591 |  | .75119 |  | .04880 |
|  | SUPERVISOR |  | 14 |  | 3.0714 |  | .82874 |  | .22149 |
|  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- |
| ITEMB41 | TEACHER |  | 317 | 2.9494 | .85220 | .05536 |
|  |
|  | SUPERVISOR |  | 14 | 2.7143 | .82542 | .22060 |
|  |  |  |  |  |  |  |
| ITEMB42 | TEACHER |  | 317 | 3.1224 | .92848 | .06031 |
|  | SUPERVISOR |  | 14 | 2.9286 | .91687 | .24505 |
|  |  |  |  |  |  |  |
| ITEMB43 | TEACHER |  | 317 | 3.1181 | .88464 | .05746 |
|  | SUPERVISOR |  | 14 | 2.8571 | .94926 | .25370 |
|  |  |  |  |  |  |  |
| ITEMB44 | TEACHER |  | 317 | 3.3797 | .85327 | .05543 |
|  | SUPERVISOR |  | 14 | 3.6429 | .63332 | .16926 |
|  |  |  |  |  |  |  |
| ITEMB45 | TEACHER |  | 317 | 3.4515 | .78301 | .05086 |
|  | SUPERVISOR |  | 14 | 3.5714 | .85163 | .22761 |
|  |  |  |  |  |  |  |
| ITEMB46 | TEACHER |  | 317 | 3.1603 | .84349 | .05479 |
|  | SUPERVISOR |  | 14 | 3.2857 | 1.06904 | .28571 |
|  |  |  |  |  |  |  |
| ITEMB47 | TEACHER |  | 317 | 3.1477 | .88737 | .05764 |
|  | SUPERVISOR |  | 14 | 3.1429 | .94926 | .25370 |
|  |  |  |  |  |  |  |
| ITEMB48 | TEACHER |  | 317 | 3.1266 | .87382 | .05676 |
|  | SUPERVISOR |  | 14 | 3.4286 | .64621 | .17271 |
|  |  |  |  |  |  |  |
| ITEMB49 | TEACHER |  | 317 | 3.1266 | .83919 | .05451 |
|  | SUPERVISOR |  | 14 | 3.1429 | .86444 | .23103 |
|  |  |  |  |  |  |  |
| ITEMB50 | TEACHER |  | 317 | 3.0802 | .83736 | .05439 |
|  | SUPERVISOR |  | 14 | 3.0714 | .91687 | .24505 |
|  |  |  |  |  |  |  |
| ITEMB51 | TEACHER |  | 317 | 3.0970 | .76681 | .04981 |
|  | SUPERVISOR |  | 14 | 3.0714 | .82874 | .22149 |
|  |  |  |  |  |  |  |
| ITEMB52 | TEACHER |  | 317 | 3.1772 | .80401 | .05223 |
|  | SUPERVISOR |  | 14 | 3.2857 | .91387 | .24424 |
|  |  |  |  |  |  |  |
| ITEMB53 | TEACHER |  | 317 | 3.1899 | .79845 | .05186 |
|  | SUPERVISOR |  | 14 | 3.3571 | .84190 | .22501 |
|  |  |  |  |  |  |  |
| ITEMB54 | TEACHER |  | 317 | 3.2236 | .71648 | .04654 |
|  | SUPERVISOR |  | 14 | 3.2143 | .89258 | .23855 |
|  |  |  |  |  |  |  |

**Independent Samples Test**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Levene's Test for | | | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  | Equality of | |  |  |  |  |  |  |  |  |
|  |  |  | Variances | |  |  |  | t-test for Equality of Means | | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  | 95% Confidence | |
|  |  |  |  |  |  |  |  |  | Mean | Std. Error | Interval of the | |
|  |  |  |  |  |  |  |  |  | Difference | |
|  |  |  |  |  |  |  |  | Sig. (2- | Differenc | Differenc |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  | F |  | Sig. | | t | df | tailed) | e | e | Lower | Upper |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB1 | Equal variances assumed |  | .001 |  | .976 | .722 | 249 | .471 | .18023 | .24969 | -.31155 | .67201 |
|  | Equal variances not assumed |  |  |  |  | .789 | 14.939 | .442 | .18023 | .22842 | -.30681 | .66727 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB2 | Equal variances assumed |  | .282 |  | .596 | -.519 | 249 | .604 | -.11302 | .21765 | -.54169 | .31565 |
|  | Equal variances not assumed |  |  |  |  | -.513 | 14.534 | .616 | -.11302 | .22036 | -.58401 | .35797 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB3 | Equal variances assumed |  | .014 |  | .904 | .946 | 249 | .345 | .22272 | .23536 | -.24083 | .68628 |

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|  | Equal variances not assumed |  |  | .909 |  | 14.440 |  | .378 |  | .22272 |  | .24491 |  | -.30106 |  | .74651 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB4 | Equal variances assumed | 3.448 | .065 | .597 |  | 249 |  | .551 |  | .10579 |  | .17731 |  | -.24344 |  | .45501 |
|  | Equal variances not assumed |  |  | .791 |  | 16.056 |  | .441 |  | .10579 |  | .13375 |  | -.17767 |  | .38924 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB5 | Equal variances assumed | .288 | .592 | 1.228 |  | 249 |  | .221 |  | .26552 |  | .21630 |  | -.16049 |  | .69154 |
|  | Equal variances not assumed |  |  | .979 |  | 13.939 |  | .344 |  | .26552 |  | .27122 |  | -.31642 |  | .84746 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB6 | Equal variances assumed | .018 | .895 | 1.423 |  | 249 |  | .156 |  | .27336 |  | .19215 |  | -.10509 |  | .65180 |
|  | Equal variances not assumed |  |  | 1.421 |  | 14.575 |  | .176 |  | .27336 |  | .19232 |  | -.13761 |  | .68433 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB7 | Equal variances assumed | 3.157 | .077 | -.910 |  | 249 |  | .364 |  | -.20585 |  | .22615 |  | -.65125 |  | .23956 |
|  | Equal variances not assumed |  |  | -1.632 |  | 19.583 |  | .119 |  | -.20585 |  | .12617 |  | -.46939 |  | .05770 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB8 | Equal variances assumed | .471 | .493 | -.130 |  | 249 |  | .897 |  | -.03044 |  | .23395 |  | -.49122 |  | .43034 |
|  | Equal variances not assumed |  |  | -.138 |  | 14.794 |  | .892 |  | -.03044 |  | .22134 |  | -.50278 |  | .44190 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB9 | Equal variances assumed | .131 | .718 | -.433 |  | 249 |  | .665 |  | -.08831 |  | .20391 |  | -.48991 |  | .31330 |
|  | Equal variances not assumed |  |  | -.439 |  | 14.632 |  | .667 |  | -.08831 |  | .20098 |  | -.51762 |  | .34101 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB10 | Equal variances assumed | .767 | .382 | .494 |  | 249 |  | .622 |  | .10458 |  | .21169 |  | -.31235 |  | .52151 |
|  | Equal variances not assumed |  |  | .642 |  | 15.918 |  | .530 |  | .10458 |  | .16279 |  | -.24066 |  | .44982 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB11 | Equal variances assumed | .632 | .428 | .041 |  | 249 |  | .968 |  | .00844 |  | .20769 |  | -.40062 |  | .41749 |
|  | Equal variances not assumed |  |  | .045 |  | 14.984 |  | .965 |  | .00844 |  | .18814 |  | -.39262 |  | .40950 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB12 | Equal variances assumed | .000 | .985 | .732 |  | 249 |  | .465 |  | .17300 |  | .23637 |  | -.29255 |  | .63854 |
|  | Equal variances not assumed |  |  | .659 |  | 14.239 |  | .521 |  | .17300 |  | .26269 |  | -.38954 |  | .73553 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB13 | Equal variances assumed | .002 | .962 | .690 |  | 249 |  | .491 |  | .15280 |  | .22145 |  | -.28335 |  | .58896 |
|  | Equal variances not assumed |  |  | .626 |  | 14.261 |  | .541 |  | .15280 |  | .24415 |  | -.36994 |  | .67555 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB14 | Equal variances assumed | .522 | .471 | -.280 |  | 249 |  | .780 |  | -.05696 |  | .20325 |  | -.45728 |  | .34335 |
|  | Equal variances not assumed |  |  | -.316 |  | 15.080 |  | .757 |  | -.05696 |  | .18042 |  | -.44135 |  | .32742 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB15 | Equal variances assumed | 1.094 | .297 | -1.193 |  | 249 |  | .234 |  | -.26763 |  | .22427 |  | -.70934 |  | .17408 |
|  | Equal variances not assumed |  |  | -1.480 |  | 15.607 |  | .159 |  | -.26763 |  | .18080 |  | -.65170 |  | .11644 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB16 | Equal variances assumed | 2.191 | .140 | -.628 |  | 249 |  | .531 |  | -.11995 |  | .19103 |  | -.49620 |  | .25629 |
|  | Equal variances not assumed |  |  | -.829 |  | 16.028 |  | .419 |  | -.11995 |  | .14465 |  | -.42656 |  | .18666 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB17 | Equal variances assumed | 2.050 | .153 | -.801 |  | 249 |  | .424 |  | -.17089 |  | .21335 |  | -.59109 |  | .24932 |
|  | Equal variances not assumed |  |  | -1.156 |  | 16.761 |  | .264 |  | -.17089 |  | .14781 |  | -.48307 |  | .14130 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB18 | Equal variances assumed | 2.610 | .107 | -.857 |  | 249 |  | .392 |  | -.17058 |  | .19900 |  | -.56252 |  | .22135 |
|  | Equal variances not assumed |  |  | -1.174 |  | 16.307 |  | .257 |  | -.17058 |  | .14528 |  | -.47810 |  | .13693 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB19 | Equal variances assumed | 4.590 | .033 | -1.529 |  | 249 |  | .127 |  | -.36438 |  | .23825 |  | -.83361 |  | .10486 |
|  | Equal variances not assumed |  |  | -2.518 |  | 18.248 |  | .021 |  | -.36438 |  | .14472 |  | -.66813 |  | -.06063 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB20 | Equal variances assumed | 4.128 | .043 | -1.300 |  | 249 |  | .195 |  | -.27125 |  | .20868 |  | -.68225 |  | .13975 |
|  | Equal variances not assumed |  |  | -1.588 |  | 15.517 |  | .132 |  | -.27125 |  | .17077 |  | -.63419 |  | .09169 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB21 | Equal variances assumed | .043 | .836 | -.151 |  | 249 |  | .880 |  | -.02712 |  | .17963 |  | -.38092 |  | .32667 |
|  | Equal variances not assumed |  |  | -.153 |  | 14.615 |  | .881 |  | -.02712 |  | .17785 |  | -.40707 |  | .35282 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB22 | Equal variances assumed | 1.172 | .280 | -1.226 |  | 249 |  | .221 |  | -.26341 |  | .21485 |  | -.68657 |  | .15975 |
|  | Equal variances not assumed |  |  | -1.462 |  | 15.377 |  | .164 |  | -.26341 |  | .18013 |  | -.64653 |  | .11971 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB23 | Equal variances assumed | .385 | .535 | -.346 |  | 249 |  | .730 |  | -.07022 |  | .20305 |  | -.47013 |  | .32968 |

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|  | Equal variances not assumed |  |  | -.399 |  | 15.198 |  | .695 |  | -.07022 |  | .17602 |  | -.44498 |  | .30453 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB24 | Equal variances assumed | .311 | .577 | .120 |  | 249 |  | .905 |  | .02652 |  | .22168 |  | -.41008 |  | .46313 |
|  | Equal variances not assumed |  |  | .132 |  | 14.977 |  | .897 |  | .02652 |  | .20111 |  | -.40220 |  | .45524 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB25 | Equal variances assumed | 1.864 | .173 | -.329 |  | 249 |  | .742 |  | -.07505 |  | .22777 |  | -.52364 |  | .37355 |
|  | Equal variances not assumed |  |  | -.457 |  | 16.418 |  | .653 |  | -.07505 |  | .16406 |  | -.42212 |  | .27203 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB26 | Equal variances assumed | 3.113 | .079 | .180 |  | 249 |  | .857 |  | .04250 |  | .23569 |  | -.42171 |  | .50670 |
|  | Equal variances not assumed |  |  | .244 |  | 16.221 |  | .810 |  | .04250 |  | .17396 |  | -.32587 |  | .41086 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB27 | Equal variances assumed | .450 | .503 | -1.187 |  | 249 |  | .236 |  | -.26432 |  | .22265 |  | -.70283 |  | .17420 |
|  | Equal variances not assumed |  |  | -1.845 |  | 17.526 |  | .082 |  | -.26432 |  | .14325 |  | -.56586 |  | .03723 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB28 | Equal variances assumed | 1.510 | .220 | -.020 |  | 249 |  | .984 |  | -.00392 |  | .19240 |  | -.38286 |  | .37502 |
|  | Equal variances not assumed |  |  | -.029 |  | 16.646 |  | .977 |  | -.00392 |  | .13497 |  | -.28914 |  | .28131 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB29 | Equal variances assumed | 1.221 | .270 | .280 |  | 249 |  | .780 |  | .06329 |  | .22595 |  | -.38173 |  | .50831 |
|  | Equal variances not assumed |  |  | .334 |  | 15.379 |  | .743 |  | .06329 |  | .18938 |  | -.33950 |  | .46608 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB30 | Equal variances assumed | .009 | .924 | .505 |  | 249 |  | .614 |  | .10910 |  | .21591 |  | -.31614 |  | .53435 |
|  | Equal variances not assumed |  |  | .514 |  | 14.644 |  | .615 |  | .10910 |  | .21211 |  | -.34396 |  | .56217 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB31 | Equal variances assumed | .173 | .678 | 1.483 |  | 249 |  | .139 |  | .33514 |  | .22605 |  | -.11008 |  | .78036 |
|  | Equal variances not assumed |  |  | 1.434 |  | 14.461 |  | .173 |  | .33514 |  | .23376 |  | -.16473 |  | .83501 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB32 | Equal variances assumed | .132 | .716 | .473 |  | 249 |  | .637 |  | .10850 |  | .22953 |  | -.34357 |  | .56057 |
|  | Equal variances not assumed |  |  | .478 |  | 14.616 |  | .640 |  | .10850 |  | .22717 |  | -.37682 |  | .59382 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB33 | Equal variances assumed | .415 | .520 | .712 |  | 249 |  | .477 |  | .14617 |  | .20525 |  | -.25808 |  | .55042 |
|  | Equal variances not assumed |  |  | .635 |  | 14.214 |  | .535 |  | .14617 |  | .23009 |  | -.34663 |  | .63897 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB34 | Equal variances assumed | .299 | .585 | .905 |  | 249 |  | .366 |  | .20585 |  | .22749 |  | -.24220 |  | .65389 |
|  | Equal variances not assumed |  |  | 1.058 |  | 15.268 |  | .307 |  | .20585 |  | .19458 |  | -.20826 |  | .61995 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB35 | Equal variances assumed | .025 | .875 | .736 |  | 249 |  | .462 |  | .13442 |  | .18256 |  | -.22513 |  | .49397 |
|  | Equal variances not assumed |  |  | .737 |  | 14.582 |  | .473 |  | .13442 |  | .18236 |  | -.25525 |  | .52409 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB36 | Equal variances assumed | 3.868 | .050 | -.368 |  | 249 |  | .713 |  | -.08379 |  | .22785 |  | -.53255 |  | .36498 |
|  | Equal variances not assumed |  |  | -.548 |  | 17.066 |  | .591 |  | -.08379 |  | .15296 |  | -.40641 |  | .23884 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB37 | Equal variances assumed | .089 | .765 | .695 |  | 249 |  | .487 |  | .15582 |  | .22406 |  | -.28547 |  | .59710 |
|  | Equal variances not assumed |  |  | .684 |  | 14.521 |  | .505 |  | .15582 |  | .22771 |  | -.33094 |  | .64257 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB38 | Equal variances assumed | .460 | .498 | -.329 |  | 249 |  | .742 |  | -.07113 |  | .21595 |  | -.49644 |  | .35419 |
|  | Equal variances not assumed |  |  | -.335 |  | 14.645 |  | .742 |  | -.07113 |  | .21211 |  | -.52420 |  | .38194 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB39 | Equal variances assumed | .354 | .552 | -.384 |  | 249 |  | .701 |  | -.09283 |  | .24149 |  | -.56845 |  | .38280 |
|  | Equal variances not assumed |  |  | -.427 |  | 15.014 |  | .675 |  | -.09283 |  | .21736 |  | -.55608 |  | .37043 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB40 | Equal variances assumed | .032 | .858 | -.059 |  | 249 |  | .953 |  | -.01236 |  | .20778 |  | -.42158 |  | .39687 |
|  | Equal variances not assumed |  |  | -.054 |  | 14.291 |  | .957 |  | -.01236 |  | .22680 |  | -.49787 |  | .47316 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB41 | Equal variances assumed | .009 | .924 | 1.005 |  | 249 |  | .316 |  | .23508 |  | .23401 |  | -.22581 |  | .69597 |
|  | Equal variances not assumed |  |  | 1.034 |  | 14.685 |  | .318 |  | .23508 |  | .22744 |  | -.25061 |  | .72077 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB42 | Equal variances assumed | .146 | .703 | .759 |  | 249 |  | .448 |  | .19379 |  | .25521 |  | -.30885 |  | .69643 |
|  | Equal variances not assumed |  |  | .768 |  | 14.620 |  | .455 |  | .19379 |  | .25236 |  | -.34532 |  | .73290 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB43 | Equal variances assumed | .056 | .813 | 1.068 |  | 249 |  | .286 |  | .26100 |  | .24427 |  | -.22011 |  | .74211 |

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|  | Equal variances not assumed |  |  | 1.003 |  | 14.366 |  | .332 |  | .26100 |  | .26013 |  | -.29559 |  | .81759 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB44 | Equal variances assumed | 1.944 | .164 | -1.135 |  | 249 |  | .258 |  | -.26311 |  | .23192 |  | -.71988 |  | .19366 |
|  | Equal variances not assumed |  |  | -1.477 |  | 15.927 |  | .159 |  | -.26311 |  | .17811 |  | -.64082 |  | .11460 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB45 | Equal variances assumed | .180 | .671 | -.554 |  | 249 |  | .580 |  | -.11995 |  | .21639 |  | -.54613 |  | .30623 |
|  | Equal variances not assumed |  |  | -.514 |  | 14.329 |  | .615 |  | -.11995 |  | .23322 |  | -.61909 |  | .37918 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB46 | Equal variances assumed | 1.224 | .270 | -.532 |  | 249 |  | .595 |  | -.12538 |  | .23564 |  | -.58947 |  | .33872 |
|  | Equal variances not assumed |  |  | -.431 |  | 13.973 |  | .673 |  | -.12538 |  | .29092 |  | -.74945 |  | .49870 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB47 | Equal variances assumed | .060 | .806 | .020 |  | 249 |  | .984 |  | .00482 |  | .24498 |  | -.47768 |  | .48732 |
|  | Equal variances not assumed |  |  | .019 |  | 14.375 |  | .985 |  | .00482 |  | .26017 |  | -.55182 |  | .56146 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB48 | Equal variances assumed | .298 | .586 | -1.272 |  | 249 |  | .205 |  | -.30199 |  | .23748 |  | -.76971 |  | .16573 |
|  | Equal variances not assumed |  |  | -1.661 |  | 15.950 |  | .116 |  | -.30199 |  | .18179 |  | -.68747 |  | .08350 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB49 | Equal variances assumed | .092 | .762 | -.070 |  | 249 |  | .944 |  | -.01627 |  | .23118 |  | -.47159 |  | .43905 |
|  | Equal variances not assumed |  |  | -.069 |  | 14.485 |  | .946 |  | -.01627 |  | .23737 |  | -.52380 |  | .49125 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB50 | Equal variances assumed | .032 | .859 | .038 |  | 249 |  | .970 |  | .00874 |  | .23150 |  | -.44721 |  | .46469 |
|  | Equal variances not assumed |  |  | .035 |  | 14.311 |  | .973 |  | .00874 |  | .25101 |  | -.52853 |  | .54601 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB51 | Equal variances assumed | .120 | .729 | .121 |  | 249 |  | .904 |  | .02562 |  | .21183 |  | -.39159 |  | .44282 |
|  | Equal variances not assumed |  |  | .113 |  | 14.346 |  | .912 |  | .02562 |  | .22702 |  | -.46020 |  | .51143 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB52 | Equal variances assumed | .315 | .575 | -.487 |  | 249 |  | .627 |  | -.10850 |  | .22281 |  | -.54734 |  | .33034 |
|  | Equal variances not assumed |  |  | -.434 |  | 14.214 |  | .671 |  | -.10850 |  | .24976 |  | -.64343 |  | .42644 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB53 | Equal variances assumed | .572 | .450 | -.759 |  | 249 |  | .448 |  | -.16727 |  | .22025 |  | -.60105 |  | .26652 |
|  | Equal variances not assumed |  |  | -.724 |  | 14.416 |  | .480 |  | -.16727 |  | .23091 |  | -.66118 |  | .32664 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMB54 | Equal variances assumed | .603 | .438 | .047 |  | 249 |  | .963 |  | .00934 |  | .19988 |  | -.38433 |  | .40301 |
|  | Equal variances not assumed |  |  | .038 |  | 14.007 |  | .970 |  | .00934 |  | .24305 |  | -.51192 |  | .53061 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**HYPOTHESIS 3**

**Group Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | STATUS | N | Mean | Std. Deviation | Std. Error Mean |
|  |
|  |  |  |  |  |  |
| ITEMC1 | TEACHER | 317 | 3.2954 | .74026 | .04809 |
|  | SUPERVISOR | 14 | 3.2143 | 1.05090 | .28087 |
|  |  |  |  |  |  |
| ITEMC2 | TEACHER | 317 | 3.2068 | .77806 | .05054 |
|  | SUPERVISOR | 14 | 3.0000 | .96077 | .25678 |
|  |  |  |  |  |  |
| ITEMC3 | TEACHER | 317 | 3.1646 | .86500 | .05619 |
|  | SUPERVISOR | 14 | 3.0000 | 1.03775 | .27735 |
|  |  |  |  |  |  |
| ITEMC4 | TEACHER | 317 | 3.2363 | .77232 | .05017 |
|  | SUPERVISOR | 14 | 3.4286 | .85163 | .22761 |
|  |  |  |  |  |  |
| ITEMC5 | TEACHER | 317 | 2.9789 | .78895 | .05125 |
|  | SUPERVISOR | 14 | 3.0000 | .67937 | .18157 |
|  |  |  |  |  |  |
| ITEMC6 | TEACHER | 317 | 3.0549 | .78731 | .05114 |
|  | SUPERVISOR | 14 | 2.8571 | .77033 | .20588 |
|  |  |  |  |  |  |
| ITEMC7 | TEACHER | 317 | 2.9536 | .77155 | .05012 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | SUPERVISOR |  | 14 | |  | 2.9286 | |  |  | .82874 |  |  | .22149 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC8 | TEACHER |  | 317 | |  | 2.7932 | |  |  | .82562 |  |  | .05363 |  |  |  |  |
|  | SUPERVISOR |  | 14 | |  | 2.8571 | |  |  | .66299 |  |  | .17719 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC9 | TEACHER |  | 317 | |  | 2.7722 | |  |  | .79643 |  |  | .05173 |  |  |  |  |
|  | SUPERVISOR |  | 14 | |  | 2.4286 | |  |  | .51355 |  |  | .13725 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC10 | TEACHER |  | 317 | |  | 2.9072 | |  |  | .72474 |  |  | .04708 |  |  |  |  |
|  | SUPERVISOR |  | 14 | |  | 2.8571 | |  |  | .86444 |  |  | .23103 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC11 | TEACHER |  | 317 | |  | 2.8819 | |  |  | .82001 |  |  | .05327 |  |  |  |  |
|  | SUPERVISOR |  | 14 | |  | 2.5714 | |  |  | .75593 |  |  | .20203 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC12 | TEACHER |  | 317 | |  | 3.1561 | |  |  | .70478 |  |  | .04578 |  |  |  |  |
|  | SUPERVISOR |  | 14 | |  | 3.1429 | |  |  | .53452 |  |  | .14286 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC13 | TEACHER |  | 317 | |  | 3.1857 | |  |  | .80209 |  |  | .05210 |  |  |  |  |
|  | SUPERVISOR |  | 14 | |  | 3.0000 | |  |  | .96077 |  |  | .25678 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC14 | TEACHER |  | 317 | |  | 3.1224 | |  |  | .69334 |  |  | .04504 |  |  |  |  |
|  | SUPERVISOR |  | 14 | |  | 3.0000 | |  |  | .39223 |  |  | .10483 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Independent Samples Test** | | | | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | Levene's Test for | | |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | Equality of | | |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | Variances | | |  |  |  | t-test for Equality of Means | | | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 95% Confidence | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Std. Error | Interval of the | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Difference | |
|  |  |  |  |  |  |  |  |  |  |  |  | Sig. (2- | Mean | | Differenc |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | F | Sig. | | t | Df | | tailed) | Difference | | e | Lower | Upper |
|  |  | |  |  |  | |  | |  |  | |  |  | |  |  |  |
| ITEMC1 | Equal variances assumed | |  |  | 1.944 | | .164 | | .388 | 249 | | .698 | .08107 | | .20893 | -.33042 | .49257 |
|  | Equal variances not assumed | | |  |  |  |  |  | .285 | 13.773 | | .780 | .08107 | | .28495 | -.53104 | .69318 |
|  |  | |  |  |  | |  | |  |  | |  |  | |  |  |  |
| ITEMC2 | Equal variances assumed | |  |  | .442 | | .507 | | .953 | 249 | | .341 | .20675 | | .21691 | -.22046 | .63397 |
|  | Equal variances not assumed | | |  |  |  |  |  | .790 | 14.026 | | .443 | .20675 | | .26170 | -.35445 | .76795 |
|  |  | |  |  |  | |  | |  |  | |  |  | |  |  |  |
| ITEMC3 | Equal variances assumed | |  |  | 1.492 | | .223 | | .684 | 249 | | .495 | .16456 | | .24062 | -.30936 | .63848 |
|  | Equal variances not assumed | | |  |  |  |  |  | .582 | 14.088 | | .570 | .16456 | | .28298 | -.44203 | .77114 |
|  |  | |  |  |  | |  | |  |  | |  |  | |  |  |  |
| ITEMC4 | Equal variances assumed | |  |  | .073 | | .788 | | -.900 | 249 | | .369 | -.19228 | | .21361 | -.61300 | .22844 |
|  | Equal variances not assumed | | |  |  |  |  |  | -.825 | 14.292 | | .423 | -.19228 | | .23307 | -.69122 | .30665 |
|  |  | |  |  |  | |  | |  |  | |  |  | |  |  |  |
| ITEMC5 | Equal variances assumed | |  |  | .581 | | .447 | | -.098 | 249 | | .922 | -.02110 | | .21552 | -.44558 | .40338 |
|  | Equal variances not assumed | | |  |  |  |  |  | -.112 | 15.148 | | .912 | -.02110 | | .18866 | -.42288 | .38068 |
|  |  | |  |  |  | |  | |  |  | |  |  | |  |  |  |
| ITEMC6 | Equal variances assumed | |  |  | .139 | | .709 | | .914 | 249 | | .362 | .19771 | | .21630 | -.22831 | .62372 |
|  | Equal variances not assumed | | |  |  |  |  |  | .932 | 14.651 | | .366 | .19771 | | .21214 | -.25539 | .65081 |
|  |  | |  |  |  | |  | |  |  | |  |  | |  |  |  |
| ITEMC7 | Equal variances assumed | |  |  | .007 | | .931 | | .117 | 249 | | .907 | .02502 | | .21306 | -.39461 | .44464 |
|  | Equal variances not assumed | | |  |  |  |  |  | .110 | 14.363 | | .914 | .02502 | | .22709 | -.46089 | .51092 |
|  |  | |  |  |  | |  | |  |  | |  |  | |  |  |  |
| ITEMC8 | Equal variances assumed | |  |  | 1.391 | | .239 | | -.284 | 249 | | .777 | -.06389 | | .22497 | -.50697 | .37918 |
|  | Equal variances not assumed | | |  |  |  |  |  | -.345 | 15.484 | | .735 | -.06389 | | .18513 | -.45742 | .32963 |
|  |  | |  |  |  | |  | |  |  | |  |  | |  |  |  |
| ITEMC9 | Equal variances assumed | |  |  | 1.167 | | .281 | | 1.593 | 249 | | .112 | .34358 | | .21569 | -.08122 | .76838 |
|  | Equal variances not assumed | | |  |  |  |  |  | 2.342 | 16.937 | | .032 | .34358 | | .14668 | .03403 | .65313 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ITEMC10 | Equal variances assumed |  | .796 | .373 | .248 | 249 | .804 | .05003 | .20152 | -.34687 | .44693 |
|  |
|  | Equal variances not assumed |  |  |  | .212 | 14.101 | .835 | .05003 | .23578 | -.45533 | .55539 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC11 | Equal variances assumed |  | .003 | .956 | 1.382 | 249 | .168 | .31043 | .22465 | -.13203 | .75289 |
|  | Equal variances not assumed |  |  |  | 1.486 | 14.866 | .158 | .31043 | .20893 | -.13525 | .75611 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC12 | Equal variances assumed |  | 1.392 | .239 | .069 | 249 | .945 | .01326 | .19168 | -.36426 | .39078 |
|  | Equal variances not assumed |  |  |  | .088 | 15.798 | .931 | .01326 | .15001 | -.30508 | .33161 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC13 | Equal variances assumed |  | .189 | .664 | .832 | 249 | .406 | .18565 | .22310 | -.25375 | .62506 |
|  | Equal variances not assumed |  |  |  | .709 | 14.091 | .490 | .18565 | .26201 | -.37596 | .74727 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| ITEMC14 | Equal variances assumed |  | 7.782 | .006 | .653 | 249 | .514 | .12236 | .18728 | -.24650 | .49122 |
|  | Equal variances not assumed |  |  |  | 1.072 | 18.208 | .298 | .12236 | .11409 | -.11714 | .36187 |
|  |  |  |  |  |  |  |  |  |  |  |  |

**HYPOTHESIS 4**

**Group Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | STATUS | N | Mean | Std. Deviation | Std. Error Mean |
|  |  |  |  |  |  |
| ITEMD1 | TEACHER | 317 | 3.0717 | .79132 | .05140 |
|  | SUPERVISOR | 14 | 3.0714 | .73005 | .19511 |
|  |  |  |  |  |  |
| ITEMD2 | TEACHER | 317 | 2.8776 | .82711 | .05373 |
|  | SUPERVISOR | 14 | 2.5714 | .64621 | .17271 |
|  |  |  |  |  |  |
| ITEMD3 | TEACHER | 317 | 3.0338 | .72407 | .04703 |
|  | SUPERVISOR | 14 | 3.0714 | .82874 | .22149 |
|  |  |  |  |  |  |
| ITEMD4 | TEACHER | 317 | 2.9114 | .76230 | .04952 |
|  | SUPERVISOR | 14 | 2.7143 | .61125 | .16336 |
|  |  |  |  |  |  |
| ITEMD5 | TEACHER | 317 | 2.9536 | .80908 | .05256 |
|  | SUPERVISOR | 14 | 2.8571 | .66299 | .17719 |
|  |  |  |  |  |  |
| ITEMD6 | TEACHER | 317 | 3.0295 | .89441 | .05810 |
|  | SUPERVISOR | 14 | 3.0000 | .87706 | .23440 |
|  |  |  |  |  |  |
| ITEMD7 | TEACHER | 317 | 3.3080 | .82471 | .05357 |
|  | SUPERVISOR | 14 | 3.0714 | 1.07161 | .28640 |
|  |  |  |  |  |  |
| ITEMD8 | TEACHER | 317 | 3.3671 | .85634 | .05563 |
|  | SUPERVISOR | 14 | 3.3571 | .74495 | .19910 |
|  |  |  |  |  |  |
| ITEMD9 | TEACHER | 317 | 3.3080 | .85992 | .05586 |
|  | SUPERVISOR | 14 | 3.5714 | .64621 | .17271 |
|  |  |  |  |  |  |

**Independent Samples Test**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | Levene's Test | |  | |  | |  | |  | |  | |  | | |  | |
|  |  | | for Equality of | |  | |  | |  | |  | |  | |  | | |  | |
|  |  | | Variances | |  | |  | | t-test for Equality of Means | | | | | | | | |  | |
|  |  | |  |  |  | |  | |  | |  | |  | |  | | |  | |
|  |  | |  |  |  | |  | |  | |  | | Std. | | 95% Confidence Interval | | | | |
|  |  | |  |  |  | |  | |  | | Mean | | Error | | of the Difference | | | | |
|  |  | |  |  |  | |  | | Sig. (2- | | Differen | | Differen | |  | | |  | |
|  |  | |  |  |  | |  | |  | | |  | |
|  |  | | F | Sig. | t | | df | | tailed) | | ce | | ce | | Lower | | | Upper | |
|  |  | |  |  |  | |  | |  | |  | |  | |  | | |  | |
| ITEMD1 | Equal variances assumed | | 1.872 | .172 | .001 | | 249 | | .999 | | .00030 | | .21680 | | -.42669 | | | .42729 | |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Equal variances not assumed |  | |  | .001 |  | 14.863 |  | .999 |  | .00030 |  | .20177 |  | -.43011 | |  | .43071 |  |
|  |  | |  |  |  |  |  |  |  |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |
| ITEMD2 | Equal variances assumed | .154 | | .695 | 1.360 |  | 249 |  | .175 |  | .30621 |  | .22517 |  | -.13726 | |  | .74968 |  |
|  | Equal variances not assumed |  | |  | 1.693 |  | 15.630 |  | .110 |  | .30621 |  | .18087 |  | -.07796 | |  | .69037 |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |
| ITEMD3 | Equal variances assumed | .109 | | .741 | -.188 |  | 249 |  | .851 |  | -.03767 |  | .20076 |  | -.43307 | |  | .35772 |  |
|  | Equal variances not assumed |  | |  | -.166 |  | 14.197 |  | .870 |  | -.03767 |  | .22643 |  | -.52268 | |  | .44734 |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |
| ITEMD4 | Equal variances assumed | .039 | | .844 | .949 |  | 249 |  | .344 |  | .19711 |  | .20770 |  | -.21197 | |  | .60618 |  |
|  | Equal variances not assumed |  | |  | 1.155 |  | 15.491 |  | .266 |  | .19711 |  | .17070 |  | -.16574 | |  | .55995 |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |
| ITEMD5 | Equal variances assumed | .757 | | .385 | .437 |  | 249 |  | .662 |  | .09644 |  | .22062 |  | -.33807 | |  | .53095 |  |
|  | Equal variances not assumed |  | |  | .522 |  | 15.381 |  | .609 |  | .09644 |  | .18482 |  | -.29665 | |  | .48953 |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |
| ITEMD6 | Equal variances assumed | .000 | | .990 | .120 |  | 249 |  | .904 |  | .02954 |  | .24575 |  | -.45448 | |  | .51356 |  |
|  | Equal variances not assumed |  | |  | .122 |  | 14.643 |  | .904 |  | .02954 |  | .24150 |  | -.48630 | |  | .54537 |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |
| ITEMD7 | Equal variances assumed | .544 | | .461 | 1.025 |  | 249 |  | .306 |  | .23659 |  | .23087 |  | -.21812 | |  | .69130 |  |
|  | Equal variances not assumed |  | |  | .812 |  | 13.925 |  | .430 |  | .23659 |  | .29137 |  | -.38865 | |  | .86183 |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |
| ITEMD8 | Equal variances assumed | .744 | | .389 | .042 |  | 249 |  | .966 |  | .00995 |  | .23403 |  | -.45098 | |  | .47087 |  |
|  | Equal variances not assumed |  | |  | .048 |  | 15.104 |  | .962 |  | .00995 |  | .20672 |  | -.43040 | |  | .45030 |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |
| ITEMD9 | Equal variances assumed | 1.917 | | .167 | -1.127 |  | 249 |  | .261 |  | -.26341 |  | .23381 |  | -.72391 | |  | .19709 |  |
|  | Equal variances not assumed |  | |  | -1.451 |  | 15.852 |  | .166 |  | -.26341 |  | .18151 |  | -.64850 | |  | .12167 |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |

**HYPOTHESIS 5**

**Group Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | STATUS | N | Mean | Std. Deviation | Std. Error Mean |
|  |  |  |  |  |  |
| ITEME1 | TEACHER | 317 | 3.5527 | .65932 | .04283 |
|  | SUPERVISOR | 14 | 3.5714 | .64621 | .17271 |
|  |  |  |  |  |  |
| ITEME2 | TEACHER | 317 | 3.2827 | .83377 | .05416 |
|  | SUPERVISOR | 14 | 3.2857 | .72627 | .19410 |
|  |  |  |  |  |  |
| ITEME3 | TEACHER | 317 | 3.4557 | .67266 | .04369 |
|  | SUPERVISOR | 14 | 3.4286 | .64621 | .17271 |
|  |  |  |  |  |  |
| ITEME4 | TEACHER | 317 | 3.3038 | .85897 | .05580 |
|  | SUPERVISOR | 14 | 3.5714 | .51355 | .13725 |
|  |  |  |  |  |  |
| ITEME5 | TEACHER | 317 | 3.3755 | .71182 | .04624 |
|  | SUPERVISOR | 14 | 3.6429 | .63332 | .16926 |
|  |  |  |  |  |  |
| ITEME6 | TEACHER | 317 | 3.4388 | .68384 | .04442 |
|  | SUPERVISOR | 14 | 3.3571 | .92878 | .24823 |
|  |  |  |  |  |  |
| ITEME7 | TEACHER | 317 | 3.2954 | .76281 | .04955 |
|  | SUPERVISOR | 14 | 3.5714 | .64621 | .17271 |
|  |  |  |  |  |  |
| ITEME8 | TEACHER | 317 | 3.3038 | .75388 | .04897 |
|  | SUPERVISOR | 14 | 3.3571 | .63332 | .16926 |
|  |  |  |  |  |  |
| ITEME9 | TEACHER | 317 | 3.3502 | .75894 | .04930 |
|  | SUPERVISOR | 14 | 3.3571 | .63332 | .16926 |
|  |  |  |  |  |  |
| ITEME10 | TEACHER | 317 | 3.1941 | .76765 | .04986 |
|  | SUPERVISOR | 14 | 3.2143 | .57893 | .15473 |
|  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ITEME11 | TEACHER |  | 317 | | 3.3418 | | |  | .72870 | |  | .04733 | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  | SUPERVISOR |  | 14 | | 3.1429 | | |  | .53452 | |  | .14286 | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | **Independent Samples Test** | | | | | |  |  |  |  |  |  |  |
|  |  |  |  |  |  | |  | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | Levene's Test for | | | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | Equality of | | | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | Variances | | | |  |  |  | t-test for Equality of Means | | | | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 95% Confidence | |
|  |  |  |  |  |  |  |  |  |  |  |  |  | Mean | | Std. Error |  | Interval of the | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  | Difference | |
|  |  |  |  |  |  |  |  |  |  |  |  | Sig. (2- | Differe | | Differenc |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | F |  | Sig. | | t | df | | tailed) | nce | | e |  | Lower | Upper |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME1 | Equal variances assumed | |  |  | .066 |  | .798 | | -.103 | 329 | | .918 | -.01869 | | .18115 |  | -.37548 | .33810 |
|  | Equal variances not assumed | | |  |  |  |  |  | -.105 | 14.645 | | .918 | -.01869 | | .17794 |  | -.39875 | .36138 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME2 | Equal variances assumed | |  |  | .545 |  | .461 | | -.013 | 249 | | .989 | -.00301 | | .22787 |  | -.45182 | .44579 |
|  | Equal variances not assumed | | |  |  |  |  |  | -.015 | 15.098 | | .988 | -.00301 | | .20152 |  | -.43230 | .42627 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME3 | Equal variances assumed | |  |  | .138 |  | .710 | | .147 | 249 | | .883 | .02712 | | .18464 |  | -.33653 | .39078 |
|  | Equal variances not assumed | | |  |  |  |  |  | .152 | 14.714 | | .881 | .02712 | | .17815 |  | -.35323 | .40748 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME4 | Equal variances assumed | |  |  | 3.234 |  | .073 | | -1.152 | 249 | | .250 | -.26763 | | .23226 |  | -.72507 | .18980 |
|  | Equal variances not assumed | | |  |  |  |  |  | -1.806 | 17.625 | | .088 | -.26763 | | .14816 |  | -.57938 | .04412 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME5 | Equal variances assumed | |  |  | 1.610 |  | .206 | | -1.373 | 249 | | .171 | -.26733 | | .19471 |  | -.65082 | .11616 |
|  | Equal variances not assumed | | |  |  |  |  |  | -1.524 | 15.008 | | .148 | -.26733 | | .17546 |  | -.64131 | .10665 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME6 | Equal variances assumed | |  |  | 2.066 |  | .152 | | .425 | 249 | | .671 | .08168 | | .19219 |  | -.29684 | .46020 |
|  | Equal variances not assumed | | |  |  |  |  |  | .324 | 13.845 | | .751 | .08168 | | .25217 |  | -.45974 | .62310 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME7 | Equal variances assumed | |  |  | .797 |  | .373 | | -1.326 | 249 | | .186 | -.27607 | | .20825 |  | -.68623 | .13409 |
|  | Equal variances not assumed | | |  |  |  |  |  | -1.537 | 15.223 | | .145 | -.27607 | | .17967 |  | -.65855 | .10641 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME8 | Equal variances assumed | |  |  | .694 |  | .406 | | -.259 | 249 | | .796 | -.05335 | | .20575 |  | -.45858 | .35189 |
|  | Equal variances not assumed | | |  |  |  |  |  | -.303 | 15.261 | | .766 | -.05335 | | .17620 |  | -.42836 | .32167 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME9 | Equal variances assumed | |  |  | 1.099 |  | .295 | | -.033 | 249 | | .973 | -.00693 | | .20708 |  | -.41478 | .40092 |
|  | Equal variances not assumed | | |  |  |  |  |  | -.039 | 15.293 | | .969 | -.00693 | | .17630 |  | -.38207 | .36821 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME10 | Equal variances assumed | |  |  | 1.320 |  | .252 | | -.097 | 249 | | .923 | -.02019 | | .20875 |  | -.43133 | .39094 |
|  | Equal variances not assumed | | |  |  |  |  |  | -.124 | 15.831 | | .903 | -.02019 | | .16256 |  | -.36511 | .32472 |
|  |  | |  |  |  |  |  | |  |  | |  |  | |  |  |  |  |
| ITEME11 | Equal variances assumed | |  |  | 5.055 |  | .025 | | 1.005 | 249 | | .316 | .19892 | | .19799 |  | -.19104 | .58887 |
|  | Equal variances not assumed | | |  |  |  |  |  | 1.322 | 16.000 | | .205 | .19892 | | .15049 |  | -.12012 | .51795 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |