TECHNICAL TEACHERS' COMPETENCY NEEDS FOR EFFECTIVE TEACHING OF BASIC TECHNOLOGY IN JUNIOR SECONDARY SCHOOLS IN CROSS RIVER STATE

MICHAEL, OFONMBUK ISAAC
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APPROVAL PAGE

This dissertation has been approved in partial fulfillment of the requirements for the award of the degree of Doctor of Philosophy (Ph. D.) in Technical Education (Electrical/Electronics Technology) in the Department of Technology and Vocational Education, Faculty of Education, Nnamdi Azikiwe University, Awka.

By

_____	_____
Prof. T. I. Eze Supervisor	Date
_____	_____
Dr. C. M. Ile Head of Department	Date
_____	_____
External Examiner	Date
_____	_____
Prof. N. P. M. Esomonu Dean Faculty of Education	Date
_____	_____
Prof. Ike Odimegwu Dean School of Postgraduate Studies	Date

CERTIFICATION PAGE

This is to certify that the research work reported in this dissertation is the original work of Michael, Ofonmbuk Isaac, with Registration number 2013197008F and that references to existing works were duly acknowledged. To the best of the researcher's knowledge, this work has not been submitted in part or full to Nnamdi Azikiwe University, Awka or any other institution of learning for any degree or diploma.

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Michael, Ofonmbuk Isaac Date
2013197008F

DEDICATION

This study is dedicated to my late parents, Mr. & Mrs. Isaac Michael Uyoh.

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A EMENTS

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The study was carried out to determine competency needs of technical teachers for effective teaching of Basic Technology in Cross River State. Eight research questions guided the study while eight null hypotheses were formulated and tested at 0.05 level of

significance. The study adopted descriptive survey research design. The population for the study was 82 technical teachers who were teaching 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's alpha reliability method was used to determine the internal consistency of the instrument in which 0.79 reliability coefficient was obtained for the entire instrument. Weighted Mean and Improvement Need Index (INI) were employed to analyze data for answering research questions while z-test statistic was used to test the hypotheses at 0.05 level of significance. The study found that 10 out of the 12 pedagogical competencies were needed by technical teachers for effective teaching of Basic Technology while 2 were not needed. In classroom management competency, 7 out of the 10 competencies were needed and 3 were not needed. In information and communication technology (ICT) competency, all the 12 items were needed by the technical teachers. As regards intrapersonal competency, 8 out of the 10 competencies were needed. On interpersonal competency, 9 out of the 12 items were needed. In terms of laboratory management competency, 9 out of the 12 competencies were needed. In the area of affective work competency, 4 out of the 12 competencies were needed. For instructional materials development and utilisation competency, 4 out of the 10 competencies were needed by the technical teachers for effective teaching of Basic Technology. The hypotheses tested revealed that there was no significant difference in the mean responses of male and female technical teachers in the areas of pedagogical, classroom management, information and communication technology, intrapersonal, laboratory management, affective work and instructional materials development and utilization competencies for effective teaching of Basic Technology. However, there was a significant difference in the mean responses of both male and female technical teachers as regards their interpersonal competency needs. It was recommended among others that Cross River State Ministry of Education and Secondary Education Board should organize regular retraining programme for technical teachers in the state on those areas where they are found in this study to be deficient particularly on the use of information and communication resources.

CHAPTER ONE

INTRODUCTION

Background to the Study

Teachers have been recognized as indispensable human resource and indeed the single most vital element in the educational system. This conviction is amply reflected in educational literature and in various government policy documents across the globe. For instance, Awoniyi cited in Etuk (2006) stated that new schools may be built, syllabuses revised, new teaching methods and aids recommended and new textbooks provided but in the end everything depends on the quality and quantity of teachers. Similarly, the Federal Government of Nigeria in recognition of the pivotal role of quality teachers noted in the implementation guidelines of the Universal Basic Education programme that many laudable educational initiatives in the country have failed because proper account of the teacher factor was not taken (Federal Republic of Nigeria, FRN, 2000). It therefore stated emphatically in the National Policy on Education that since no education system may rise above the quality of its teachers, teacher education shall continue to be given major emphasis in all educational planning and development (FRN, 2013).

It is worthy to note that the primary source for producing professional teachers in Nigeria is through teacher education programmes offered in teacher training institutions such as universities and colleges of education. Akpan and Silas (2013) noted that the initial training teachers receive during their teacher education programmes is inadequate to enable them continue for life to perform the changing complex tasks of the teacher for many reasons. First is the inadequacy of most teacher preparatory programmes vis-a-vis the varying standards in facilities, personnel and course offerings. Secondly, the society is continuously undergoing changes in values, attitudes and knowledge as a result of the

ever increasing rate of technological advancement. Thirdly, new and more sophisticated technologies are being developed for use in schools and teachers stand the risk of being declared redundant and obsolete if they do not avail themselves of opportunities to improve their knowledge and skills in the use of such technologies. In order to address these inadequacies in the initial training of teachers, determination of technical teachers competency needs becomes imperative.

Pearson (2007) viewed competency as ability to do something well measured against a standard especially ability acquired through experience or training. Pearson added that to be competent implies having enough knowledge and skills to do something to a satisfactory standard. Contextually, competency is the capacity of a technical teacher who is teaching Basic Technology to effectively teach the content of Basic technology curriculum in junior secondary schools. Basically, competent teachers of Basic Technology are expected to posses the skills and knowledge required in the teaching of the subject matter to students and where this is not adequate, retraining to boost their competencies becomes indispensable.

The Federal Government of Nigeria also acknowledged the need for teachers' competency improvement when it stipulated that teacher education shall continue to take cognizance of changes in methodology and the curriculum and that teachers shall be regularly exposed to innovations in the profession (FRN, 2013). Similarly, Schleicher (2012) noted that as teachers around the world are undertaking wide-range reforms to better prepare children for the higher educational demands of life and work in the 21st century, the skills that young people demand in the rapidly changing world and the competencies teachers need to effectively teach these skills in a 21st century classroom are equally changing. Schleicher further pointed out that, for instance, today, where students can access unlimited contents on search engines and where routine cognitive

skills are being digitalised or outsourced, these have serious implications for teacher preparation and continuing professional development.

Moreover, Akpan and Silas (2013) stated that retraining of teachers is imperative as it will among others enhance the improvement of their competency needs. In addition, the technical teachers recruitment process is plagued with lack of transparency and extensive application of non-professional criteria, including political patronage. Technical teachers are not seriously evaluated and they advance on promotion only by seniority. Thus, once recruited, there is no way for the authorities to get rid of even notoriously poor performers. According to Owolabi (2012), this invariably could result in a situation where Nigerian secondary schools are filled with anybody who is willing to teach such that there are non-professional teachers who have adequate subject content knowledge but lack pedagogical skills. There are also professional technical teachers who are obsolete in knowledge in the light of recent innovations and developments in the technological and educational systems. This development could be eliminated through a workable retraining programme designed to meet their competency needs.

Furthermore, Schleicher (2012) noted that globalisation and development in information and communication technology are causing profound changes in the world of work. Schleicher further noted that these changes have profound implications for teachers and the entire education system particularly with respect to the learning processes and necessary teacher competencies, Again, the Asia Society (2012) encapsulated the need for retraining of technical and vocational education and training (TVET) teachers when it stated that “We are trying to teach twenty-first century skills with twentieth-century teachers in nineteenth-century learning environments”. It added that “teacher preparation programmes should prepare teachers with the values, skills, and knowledge not just to keep abreast with the times but also be ahead of their time” (p. 6).

Really, improvement in competency needs is necessary for teachers of every subject, including teachers of Basic Technology.

Basic Technology is a compulsory subject in the basic education programme and it is being taught by technical teachers who specialize in different areas of technical education. These areas include electrical/electronics technology, building technology, woodworking technology, auto-mechanic technology among others. It is an amalgamation of topics from a wide range of technical subjects such as woodwork, metalwork, electricity/electronics, building technology, technical drawing, food storage and preservation, among others. Udoudo, Udoetuk and Ekon (2012) identified the purpose of Basic Technology to include inculcating technological literacy, exposing students to the world of work to match their talents and interests for wise vocational choice and inculcating positive attitudes towards work as a source of human identity, livelihood and power.

The need for competency improvement needs of Basic Technology teachers in Nigeria is underscored by Akpan and Silas (2013) who noted that Basic Technology is taught as an integrated subject with one teacher teaching all the components. They further argued that since the Basic Technology teachers were not prepared in all these trade areas in Basic Technology, they may not be able to teach the subject effectively because of their narrow preparation. Similarly, Ogbuanya (2005) noted that Basic Technology being an amalgamation of a number of distinctive technical trade areas should not be taught by teachers most of whom are generally trained in only one or two of these trade areas. This position is shared by Atsumbe, Raymond and Mele (2012) who reported that majority of the teachers employed to teach the subject in Kogi state cannot handle all the components effectively. Udoudo, Udoetuk and Ekon (2012) expressed the fear that this problem might become aggravated with the inclusion of new topics from Information and

Communication Technology (ICT) in the new Basic Education curriculum as these topics may tend to be difficult for some of the technical teachers to handle effectively. The implication of this is that the Basic Technology teacher must possess necessary competencies.

Selvi (2010) defined competencies as the knowledge, skills, attitudes, values, motivations and beliefs people need in order to be successful in a job. Adodo (2014) viewed competency in teaching as the ability of the teacher to exhibit on the job skills and knowledge gained as a result of training. Several areas of teachers competency have been identified in educational literature. These include instructional competencies, professionalism competencies (Roberts, Dooley, Harlin & Murphy, 2006), field competencies, curriculum competencies, emotional competencies and information and communication technology competencies (Selvi, 2010). Others are pedagogical skills and affective work skills (Atsumbe, Raymond & Mele, 2012; Akpan & Silas, 2013), intra and interpersonal competencies (the European Higher Field of Education, 2011), students mentoring competencies (Ekong, 2013b) and laboratory management competencies (Ogwo & Oranu, 2006; Onweh, 2013). This study is centred on eight broad areas of teachers' competency needs namely pedagogical competency, information and communication technology (ICT) competency, laboratory management competency, affective work competency, intra-personal competency, interpersonal competency, classroom management competency and instructional materials development and utilization competency.

Basically, gender is an important variable to consider in this study. According to Abdul-Raheem (2010), gender involves the roles, attitudes, behavior and values ascribed by the society to males and female. It is enforced, through culture practices. Hence, the type of training and exposures given to male and female individuals in a given society

depend on the people's understanding and belief. Gender, therefore is a very important variable because a person's personal orientation and outlook play a crucial role in performance. Academically, both male and female teachers are involved in the teaching of Basic Technology in Cross River State but the female technical teachers are very few in numbers in relation to the male counterparts.

Various scholars such as Igbinedion and Ojeaga (2012); Amoor (n.d); Ediagbanya, Agbaje and Suberu (2012) have identified some major factors responsible for low participation of female in technical and vocational education to include among others, low societal estimation of technical and vocational education(TVE) as education for the lowest class of people, education for the last resort, for people of low intelligent quotient, low achievers and low status occupation. Erinosho (1997), Ndahi (1987) in Edu and Edu (2012), separately observed that in the past, neither traditional nor western education encouraged or provided equal opportunities for women to enter the field of vocational and technical education. According to Ndahi (2002), during the early period of the development of technical education in Nigeria, a technician was considered a male who could repair mechanical or electronic devices or products (turn screws, nuts, and bolts). It was not conceivable at that time to think of a female as a technician, therefore, participation in these technical institution was strictly boys for industrial technical education courses and girls for the vocational home economics.

Furthermore, factors affecting female participation in TVET programmes include: relegation of women to the home; parental perceptions of cost/benefits of educating girls(this affects low income families particularly); patriarchy (female seclusion practices and early marriage); discriminatory labour market practices; masculine image of TVET projected in textbooks, media and popular assumptions; poor facilities, including teacher-supply, teacher quality and equipment; nature of TVET

occupations which is not easily combined with child-rearing and child-care; lack of female role models; gender bias TVET curriculum; peer pressure; early marriage; demand for female to care for siblings, homes and farms (Ayonmike, 2010). In order to boost the participation of female teachers in the teaching of Basic Technology, it behooves Cross River State government to urgently come out with a workable and result oriented sensitization programme.

According to Abassah (2011), it is disheartening that there is presently no well articulated and sustainable continuing professional development programme for technical teacher educators in Nigeria after the failure of the erstwhile Technical Teacher Training Programme (TTTP). According to Atsumbe, Raymond and Mele (2012), the observed poor performances of some Basic Technology teachers in Nigeria can be partly attributed to the fact that most of them commence and end their teaching careers with just the basic training received during their pre-service teacher training programmes without updating their knowledge and skills to meet with the changes in their various areas of specialization. Indeed, there are numerous documented evidences on the poor performances of Basic Technology teachers in Nigeria especially in the South-South region, and these justify why they should be retrained to enable them grow professionally and remain up-to-date and relevant. Atsumbe, Raymond and Mele (2012) reported that a survey on technical teacher production by Aina in 2008 indicated that the teacher quality factor ranks highest out of all the militating factors against the full implementation of the Basic Technology programme in Nigerian secondary schools. This source maintained that the panel observed that majority of the teachers employed to teach the subject cannot handle all the modules in Basic Technology.

Moreover, Adodo (2014) reported that most teachers of Basic Science and Technology lack knowledge of basic principles and skills in producing simple classroom

tests for evaluating students' learning outcome. In addition, Umunadi (2009) reported that most TVET teachers appear to lack adequate skills in developing and utilizing contemporary instructional materials, especially Information and Communication Technology (ICT) equipment in instructional delivery. Consequently, the quality of instructions offered by many teachers are poor and the delivery systems are made abstract because teachers teach without the relevant instructional materials. This partly contributes to students' poor performances in technology subjects in both internal and external examinations in recent years (See Appendix A, p. 147).

Adodo (2014) reported that there had been public criticism and disappointment over the students' performances in science and technology subjects in West African Examination Council (WAEC) examinations and the recent Chief examiners' report attributes these failures to poor teaching and assessment practices by teachers. This researcher has observed that the trend in students' performances in Basic Technology in the Basic Education Certificate Examinations conducted by the National Examination Council (NECO) in Cross River State is similar to the above report. It is obvious that the low competency level of the Basic Technology teachers could hamper their teaching effectiveness. Invariably, where the teacher lacks the basic competencies, their students are likely to become ill-equipped to enter and progress meaningfully in the career. This seems to be the situation in most secondary schools in Nigeria today especially in Cross River State. Obviously, this is a clear indication that the Nigerian education system is at risk as a result of the low competency level of the Basic Technology teachers.

However, it has been observed that 50% of the students who sat for Basic Education Certificate Examination (BECE) failed in Basic Technology in 2013/2014, 2014/2015 and 2015/2016 session (See appendix B, p. 156). This could be attributed to incompetency on the part of Basic Technology teachers in equipping the students with

knowledge, skills and attitudes that could assist them in performing very well in their examination. In view of the fact that teacher quality is a strong predictor of students' quality, the poor performances of students in Basic Technology calls for the attention of the stakeholders. This position is shared by Ayonmike (2010) who noted that the presence of new technologies have given rise to the demand for training and re-training in new skills in the existing and new occupational areas in order that people might fit into today's and tomorrow's world of work. Similarly, Umunadi (2010) noted that training and retraining of workers, including teachers, is necessary because of the changes occasioned by technological development and globalization.

It is pertinent to note that the acquisition of useful and relevant competencies by technical teachers who are teaching Basic Technology in Cross River State could in no small measure enhance students' performance in Basic Technology examination. From the foregoing, it is pertinent to determine technical teachers' competency needs for effective teaching of Basic Technology in junior secondary schools in Cross River State.

Statement of the Problem

It is widely acknowledged that teacher quality is a strong predictor of students' quality (Cannon, Kitchel, Duncan & Arnett, 2011)**.** This implies that the performance of the students could be linked to teachers' performance among other contributory factors. Regrettably, students' performance in Basic Technology in the Basic Education Certificate Examinations (BECE) has not been encouraging in recent years, in Cross River State. The implication of students' failure in Basic Technology examination is that their passion to study technology courses in higher institutions could be relegated to the background resulting in scarcity of qualified man-power to boost the technological development of the state.

Studies have shown that most teachers of vocational education subjects including Basic Technology in other states of Nigeria may be deficient in lots of competencies needed to boost effective teaching. These competencies may include emotional, curriculum, professionalism, field, students' mentoring, pedagogical, affective work, intrapersonal, interpersonal, information and communication technology, laboratory management, instructional materials utilisation and development competencies among others. The basic question one may ask is what are the basic competencies needed by technical teachers for effective teaching to boost the performance of students in Basic Technology in Cross River State? It is against this background therefore, that the study attempts to investigate technical teachers' competency needs for effective teaching of Basic Technology in Cross River State.

Purpose of the Study

The main purpose of the study was to determine technical teachers' competency needs for effective teaching of Basic Technology in junior secondary schools in Cross River State. Specifically, the study determined the:

1. pedagogical competency needs of technical teachers for effective teaching of Basic Technology in Junior secondary schools in Cross River State;
2. information and communication technology competency needs of technical teachers for effective teaching of Basic Technology in Junior secondary schools in Cross River State;
3. laboratory management competency needs of technical teachers for effective teaching of Basic Technology in Junior secondary schools in Cross River State;
4. affective work competency needs of technical teachers for effective teaching of Basic Technology in Junior secondary schools in Cross River State;

5. intrapersonal competency needs of technical teachers for effective teaching of Basic Technology in Junior secondary schools in Cross River State;
6. interpersonal competency needs of technical teachers for effective teaching of Basic Technology in Junior secondary schools in Cross River State;
7. classroom management competency needs of technical teachers for effective teaching of Basic Technology in Junior secondary schools in Cross River State ; and
8. instructional materials development and utilisation competency needs of technical teachers for effective teaching of Basic Technology in Junior secondary schools in Cross River State.

Significance of the Study

The findings of the study would be of immense benefit to technical teachers who are teaching Basic Technology in Cross River State, the administration of secondary schools as well as teacher education institutions, government Ministries, Departments and Agencies (MDAs) concerned with Technical and Vocational Education and Training (TVET), educational policy makers as well as educational researchers. The technical teachers who are teaching Basic Technology in Cross River State would benefit immensely from the findings of the study if they will consciously put to use the identified areas of competencies for effective teaching of Basic Technology in junior secondary schools in Cross River State. This will enable them to endeavour to update their professional competencies to facilitate their effective job performance and career success. The Basic Technology students will also benefit from the study if the identified findings are used to train teachers of Basic 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 then comprehend 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 administration of secondary schools offering Basic Technology at the junior secondary levels in Cross River State will also benefit from the findings of the study if they will strictly make use of the indentified areas of professional development needs. This will enable them to know the specific professional competencies that the teachers need to perform effectively. The findings would also guide them on the necessary resources, tools and equipment to be provided to their teachers to help them perform their duties maximally. The management of teacher education institutions would also benefit immensely from the findings of the study. The findings would guide them on the basic professional competencies that the teachers need to acquire during their training to facilitate their smooth transition to the world of work. These will also ensure their career success as future workers in the fast changing education industry. It would also guide them on what competencies to include in the curriculum of their teacher training programmes whenever a curriculum review is to be done.

The government Ministries, Departments and Agencies (MDAs) concerned with technical and vocational education and training would equally benefit from the findings of the study. The findings would guide them on the specific professional competencies that the teachers need to facilitate effective performance of their duties. This will help them to know those areas where the teachers are competent and the areas where they are deficient. This information will help them in designing appropriate professional development programmes for the teachers on those areas where the teachers are found to be deficient. The findings of the study would also be useful to government Ministries, Departments and Agencies (MDAs) concerned with the training and retraining of Basic Technology teachers as it will help them in selecting appropriate contents for retraining

of Basic Technology teachers based on their needs. This is because any training which is not based on the identified needs of the teachers is a colossal waste of time, energy and resources.

Educational policy makers would also benefit from the findings of the study if they will judiciously apply the identified technical teachers' competency needs as it would guide them to make appropriate policies that could make it mandatory for Basic Technology teachers to undergo mandatory professional development programmes required to facilitate effective teaching of Basic Technology. Lastly, when published or discussed at seminars and conferences, students of technical and vocational education as well as educational researchers and other scholars will also benefit from the findings. This is because it would provide them literature, empirical evidences and more knowledge on the underlying concepts in the study as well as guide future researchers on how to conduct similar studies.

Scope of the Study

The study was delimited to technical teachers who are teaching Basic Technology in public secondary schools in Cross River State only. In addition, the study was delimited to eight areas of technical teachers' competency needs grouped into professional, technical and social/political competency needs. These are pedagogical competencies, information and communication technology competencies, workshop/laboratory management competencies, affective work competencies, intrapersonal competencies, interpersonal competencies, classroom management competencies and instructional material development and utilization competencies.

Research Questions

The study provided answers to the following research questions:

1. What are the pedagogical competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State?
2. What are the information and communication technology competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State?
3. What are the laboratory management competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State?
4. What are the affective work competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State?
5. What are the intrapersonal competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State?
6. What are the interpersonal competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State?
7. What are the classroom management competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State?
8. What are the instructional materials development and utilisation competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State?

Hypotheses

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

1 There is no significant difference in the mean ratings of male and female respondents on pedagogical competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State.

2. There is no significant difference in the mean ratings of male and female respondents on information and communication technology competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State.
3. There is no significant difference in the mean ratings of male and female respondents on laboratory management competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State.
4. There is no significant difference in the mean ratings of male and female respondents on affective work competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State.
5. There is no significant difference in the mean ratings of male and female respondents on intrapersonal competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State.
6. There is no significant difference in the mean ratings of male and female respondents on interpersonal competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State.
7. There is no significant difference in the mean ratings of male and female respondents on classroom management competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State.
8. There is no significant difference in the mean ratings of male and female on instructional materials development and utilization competency needs of technical teachers for effective teaching of Basic Technology in junior secondary schools in Cross River State.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Review of literature related to this study is organized under the following headings and sub-headings:

Conceptual Framework

Technical Teacher Education

Competency

Needs and Needs Assessment

Basic Technology

Theoretical Framework

Social Learning Theory by Albert Bandura in 1977

Kaufman's Mega Planning Theory of Needs Assessment by Roger Kaufman in 1980

Theoretical Studies

The Needs for Effective Teaching of Basic Technology in Junior Secondary Schools

Technical Teachers' Competency Needs

Professional Competency Needs of Technical Teachers

Technical Competency Needs of Technical Teachers

Social/Political Competency Needs of Technical Teachers

The Need for Enhancing Technical Teachers' Professional Competencies

Empirical Studies

Pedagogical Competency Needs of Technical Teachers for Effective Teaching of Basic Technology

Classroom Management Competency Needs of Technical Teachers for Effective Teaching of Basic Technology

Information and Communication Technology Competency Needs of Technical Teachers for Effective Teaching of Basic Technology

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Intrapersonal Competency Needs of Technical Teachers for Effective Teaching of Basic Technology

Interpersonal Competency Needs of Technical Teachers for Effective Teaching of Basic Technology

Laboratory Management Competency Needs of Technical Teachers for Effective Teaching of Basic Technology

Affective Work Competency Needs of Technical Teachers for Effective Teaching of Basic Technology

Instructional Materials and Development Utilisation Competency Needs of Technical Teachers for Effective Teaching of Basic Technology

Summary of Review of Related Literature

Conceptual Framework

The conceptual framework upon which this study is built are the concepts of technical teacher education, competency, needs/needs assessment and Basic Technology.

Technical Teacher Education

A technical teacher also known as vocational education teacher is commonly referred to as career and technical education (CTE) teacher or career technology teacher. This teacher is professionally trained to teach in the various vocational technical education institutions including technical colleges, even the introductory technology at junior secondary schools which is prevocational (Davies, 2001). According to Miller, Bakare and Ikatule (2010), a technical teacher is an individual who is trained in pedagogy and technical area of a particular subject to impart knowledge, skills and attitudes to students in the institution. Contextually, a technical teacher is a trained personnel whose responsibility is to impart skills, knowledge and attitudes to the students of junior secondary schools in Basic Technology.

Equally, a technical teacher is a professional in his chosen occupation who possesses competent skills that enable him teach effectively. Vocational education teacher also emphasizes practical activities in the curriculum within the framework of technical and vocational education programme which leads to the mastery of functional technical and vocational knowledge being imparted to the students. However, for anybody to assume the duty of serving as a technical teacher, such a person is expected to possess the needed competencies for imparting technical knowledge and skills, especially now that the emphasis is on competency-based learning (Davies, 2001).

Technical teacher education deals with the training of technical personnel for the purposes of facilitating the creation of basic awareness of technological literacy to its

citizenry. This training which leads to the production of technology teachers is offered in universities, some polytechnics and some colleges of education in Nigeria (Inyiagu, 2009). Therefore, on the success of vocational technical education, teachers must indeed command confidence in the technical content as well as methodology of improving knowledge.

According to Suleiman and Haruna (2014), technical teacher education deals with the training and preparation of technical teachers in various subjects relating to technology such as metalwork technology, electrical/electronics technology, building construction technology, automobile technology and woodwork technology. Okoro (2006) described the technical teacher education as consisting of three basic components. These are the technical education component, professional education component and general education component.

Okoro further said that in Nigeria, technical teacher education is run at different levels of education and are controlled by different bodies or agencies. They are categorised as follows;- i. Colleges of Education technical education programmes. These are controlled by the National Commission for Colleges of Education (NCCE). The graduates are awarded the Nigerian Certificate in Education (NCE) Technical. This certificate is now regarded as the minimum teaching qualification in Nigeria. NCE technical education programmes are expected to prepare competent technical teachers that are capable of imparting Basic Technology knowledge and skills to junior secondary school students (NCCE, 2012). ii. The Bachelor of Technology Education programmes are run in Universities of Technology and some Polytechnics under the auspices of National University Commission (NUC).

These programmes lead to the award of bachelor degree in technology education (B,Tech Ed) and prepare technology teachers competently fit to teach vocational or trade

subjects such as metalwork, electronics, building construction, woodwork among others at senior secondary schools level (FGN, 2013). They are equally expected to effectively teach technical courses in Colleges of Education (Technical). iii. The post-graduate technical teachers education programmes which lead to the award of Master's and Doctoral Degrees in technology education (M. Tech. Ed. and Ph. D. Tech. Ed.) respectively. They are offered in Nigerian Universities and are controlled by the NUC. The programmes are meant to produce technology teachers for Colleges of Education, Polytechnics and Universities that run technical teachers training programmes. iv. The Post-Graduate Diploma in Education (PGDE) programme is mounted in Universities and is meant to give one year to two years professional education training to engineers and technologists who might have graduated from the universities or polytechnics and are willing to take up teaching job.

The above existing categories of technical teachers' education programmes form the basis for the classification of technical teachers in some studies or literature in Nigeria. The first three categories which are NCE Tech., B.Tech. Ed, M.Tech. Ed. and Ph.D Tech. Ed. are the so called professionally trained technical teachers. The fourth category which are the engineers and technologists with PGDE are classified as the unprofessionally trained technical teachers. This dichotomy is often used to compare technical teachers' opinion in studies relating to students' performance and teachers' competencies. (Apagu, 1997; Dirazo, 2000 & Idris, 2006).

Available literature (Jadas, 1999: Abdulwahab, 2004: Okoro, 2006 & Ogwa, 2012) have shown that the so called professionally trained technical teachers are good at teaching concepts and imparting knowledge but lack adequate manipulative skills in their field of technology. Whereas, the other group (unprofessionally trained) are described as having better possession of manipulative skills and deeper technical knowledge in their

field of specialization but deficient in teaching techniques, methods, attitudes and commitment to impart the knowledge and skills. This group of technical teachers has also been identified for quitting the teaching job at the slightest opportunity (Udo, 2012).In another development, the fact that every technical teacher specializes in only one area of technical education could constitute a meaningful setback as regards the teaching of Basic Technology as the subject comprises varying areas of technical education. Therefore, modern technical teachers must be retrained to enable them acquire sufficient professional competencies that will enable them perform effectively. This feat could be easily achieved through enhancing the competency needs of technical teachers in line with the current global advancement in technology.

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 (Aremu, 2015). According to Encarta (2007), competency is the ability to do something well, measured against a standard especially ability acquired through experience or training. This implies that competencies often serve as the basis for skill standards that specify the level of knowledge, skills and abilities required for success in workplace as potential measurement criteria for assessing competency attainment. Competency according to Grove as cited in Ede and Ariyo (2015) is a quality or state of being functionally adequate or having knowledge, skill or strength. Olaitan (2003) said, to be competent implies that an individual has acquired the knowledge, skills, attitudes and judgments which he requires in order to perform successfully at a specified proficiency level in a given work.

Competency is the capability to apply or use a set of related knowledge, skills and abilities required to successfully perform critical work functions or tasks in a defined

work setting. As a matter of fact, competency is more than just knowledge and skills. It involves the ability to meet complex demands, by drawing on and mobilizing psychosocial resources (including skills and attitudes) in a particular context. For example, the ability to communicate effectively is a competency that may draw on an individual's knowledge of language, practical information and telecommunication skills and attitudes towards those with whom he or she is communicating.

Shippmann, Ash, Battista, Carr, Eyde, Hesketh, Kehoe, Pearlman, Prien and Sanchez (2000) viewed competency as a characteristic of an employee that: contributes to successful job performance and the achievement of organizational results. These include measurable or assessable knowledge, skills and abilities plus other characteristics such as values, motivation, initiative and self control that distinguish superior performers from average performer.

Abdussalam (2006) defines competency as an optimum level of awareness, understanding and perfection which one must have achieved in order to be rated as successful and effective. According to Ugwo as cited in Alio (2006), competency is a combination of knowledge, skills and attitudes that can be developed through training and which are adequate for accomplishing some specific tasks. In another development, Aminu (2011) defined competency as the ability of an individual to perform an action to standard. These definitions show that for a technical teacher to be rated as competent he /she must possess all the qualities that make one to achieve his duties as a teacher. Similarly, in the teaching of technical subjects including Basic Technology course, teachers ought to possess those qualities that will make them to teach the subject to standard.

Stating the areas of competency that technical teachers must possess, Olaitan as cited in Tijjani and Yakubu (2015) opined that technical teachers must be competent in

the technical subjects which they teach to the extent that students achieve the technological self reliance after graduation. This specifies the need of a technical teacher to be skilful in the subject area which he/ she teaches.

Basic Technology is a practical oriented subject which calls for one to have the needed competencies in line with the accelerating pace of technological development before he could be rated as competent to teach the subject. Similarly, Ndubisi and Ali in Abdurrahman (2007) stated that professional training of teachers without proper grasp of the knowledge of the subject matter is more than a waste of time because end result can be the effective spread of ignorance. However, possessing the competencies of the trade subject taught is one thing and ability to impart same (teach) to students is another. In his own contribution, Dembicki as cited in Tijjani and Yakubu (2015) posited that, technical teachers must possess methodology in the teaching of the knowledge and manipulative skills to their students. This implies that, in education system therefore, teachers' competencies are important phenomenon in the success or failure of the educational programme. Teacher's specifically those who teaches Basic Technology, that build the grass root of science, technology and engineering for better Nigeria should possess the relevant teaching competencies, most importantly in the areas of pedagogy and skills training. These areas could allow teachers to teach their trade areas effectively.

Needs and Needs Assessment

A need literally refers to a situation in which something is necessary, especially something that has not yet happened or is not yet available. It is a strong feeling of what an individual should have in order to live a normal, healthy and comfortable life. According to Borish as cited in Muhammad, (2005), a need is the difference between the current level of knowledge and skills and what it should be. Needs assessment therefore is a systematic process for determining and addressing needs, or "gaps" between current

conditions and desired conditions or "wants". The discrepancy between the current condition and wanted condition must be measured to appropriately identify the need (Holton, Bates & Naquin, 2000). This source further posited that the need can be a desire to improve current performance or to correct a deficiency. Cekada (2011) viewed training needs assessment as an ongoing process of gathering data to determine what training needs exist so that training can be developed to help the organization accomplish its objectives. Simply put, it is the process of collecting information about an expressed or implied organizational need that could be met by conducting training.

Moreover, Leigh, Watkins, Platt and Kaufman (2000) offered a more holistic definition of needs assessment. According to them, needs assessment is the formal process of identifying needs as gaps between current and desired results, placing those needs in priority order based on the cost to meet, each need versus the cost for ignoring it and selecting the most important needs (problems or opportunities) for reduction or elimination. This source maintained that a training needs assessment is a process through which a trainer collects and analyzes information, then creates a training plan. This process determines the need for the training; identifies training needs; and examines the type and scope of resources needed to support training (Sorenson, 2002). This source further explains that one conducts a training needs assessment to seek information about:

(1) optimal performance or knowledge;

(2) actual or current performance or knowledge;

(3) feelings of trainees and other stakeholders;

(4) causes of identified problems; and

(5) solutions

In a nutshell, needs assessment can help determine current performance or knowledge levels related to a specific activity, as well as indicate the optimal

performance or knowledge needed. Swist (2001) noted that needs assessment is a part of planning processes, often used for improvement in individuals, education/training, organizations, or communities. It can refine and improve a product such as a training or service a client receives. It can be an effective tool to clarify problems and identify appropriate interventions or solutions. By clearly identifying the problem, finite resources can be directed towards developing and implementing a feasible and applicable solution. Gathering appropriate and sufficient data informs the process of developing an effective product that will address the groups needs and wants. Needs assessments are only effective when they are ends-focused and provide concrete evidence that can be used to determine which of the possible means-to-the-ends are most effective and efficient for achieving the desired results.

There are many models of needs assessment one of which is the Borich needs assessment model. According to Mckim and Saucier (2011), the Borich needs assessment model which was propounded by Borich in 1980 required that a mean weighted discrepancy score be calculated for each item, competency or activity included in the needs assessment. This source noted that the two most common types of Borich-type discrepancy scores noted in literature are importance/ability or what is/what should be models. The source explained that using what is/what should be model, a discrepancy can be calculated by comparing the participants' behaviours, skills and competencies with the goals of the programme. Thereafter, a discrepancy analysis is carried out on the two polar positions of what is and what should be. On the other hand, in the importance/ability model, a comparison could be made between a group of individuals' perceived level of importance of a task, with their expressed level of competency to complete the task. In other words, this method entails determining the perceived level of importance of the competencies and the individual’s level of competency and determining the needs by

analyzing and ranking them using Mean Weighted Discrepancy Scores (Zarafshani & Alibaygi, 2008).

However, another popular model of need assessment which is very relevant to this study is the deficiency analysis model. According to Songhori (2008), this approach to needs assessment considers individual's present needs or wants hence, it may also be called "analysis of learners" deficiencies or lacks". The author explained that this method entails asking the individuals to identify the skills, competences and resources they would need in order to move from their present situation to the desired or target situation. Thereafter, a benchmark could be set for determining the need based on the perceived needs identified by the individuals. The author added that deficiency analysis is very appropriate for determining what is needed to cover from point A (present situation) to point B (target situation). Deficiency analysis method would be very appropriate for this study since it could provide data about the resources management competencies perceived by principals as being very important for effective administration of Technical Colleges.

Basic Technology

Basic Technology is one of the core subjects taught at the junior secondary school level in Nigeria. It is a course of study introduced in the year 2007 into the primary and junior secondary schools levels of 9-3-4 system of education presently practiced in Nigeria. It is an amalgamation of topics from a wide range of technical subjects such as woodwork, metalwork, electricity/electronics, building technology, technical drawing, food storage and preservation, among others. The National Policy on Education (FGN, 2013) spells out the objectives of Basic Technology as follows:

i. to provide pre-vocational orientation for further training in technology;

ii. to provide basic technological literacy for everyday living; and

iii. to stimulate creativity.

According to Adeniyi (2007), Basic Technology is a compulsory subject in the basic education programme. The purposes are to inculcate technological literacy, expose students to the world of work to match their talents and interests for wise vocational choice and inculcate positive attitudes towards work as a source of human identity, livelihood and power. In a nutshell, Basic Technology is taught at the junior secondary school level based on the understanding that in a world increasingly driven by technology, it will be a disaster for any society not to inculcate basic technological skills in its youths.

Basic Technology is thus one of the pre-vocational subjects offered in junior secondary schools in Nigeria. By pre-vocational, it means that it is a preparatory subject preceding entry into full vocational and technical courses (Okoro, 1993 as cited Aremu, 2015). Okoro noted that the pre-vocational stages of occupational preparation enables the students to explore many occupational areas before eventually choosing one in which they would later attempt to develop full vocational skills. In other words, Basic Technology exposes the students to career in both the academic field and the technical trades since students may either leave school after the junior secondary school stage and go to an apprenticeship programme or some other out-of school vocational training or continue their career in the senior secondary or technical colleges.

Basic Technology is the preparatory aspect of Technical and Vocational Education. Technical and Vocational Education, according to the Federal Republic of Nigeria (FRN, 2013), refers to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. FRN maintained that TVET is further understood to be an

integral part of general education; a means of preparing for occupational fields and for effective participation in the world of work; an aspect of lifelong learning and a preparation for responsible citizenship; an instrument for promoting environmentally-sound sustainable development; and a method of facilitating poverty alleviation.

According to UNESCO (2010), Technical and Vocational Education and Training (TVET) includes learning aimed at developing skills in the practice of certain trades, as well as learning aimed at preparing for entry into the labour market in general. The organization maintained that in both cases, learning may be geared towards direct access to the labour market or lay the foundation for access to higher education and training with joining specific trades in view. It added that TVET encompasses programmes that provide participants with skills, knowledge and aptitudes that enable them to engage in productive work, adapt to rapidly changing labour markets and economies, and participate as responsible citizens in their respective societies. The goals of Technical and Vocational Education as contained in the National Policy on Education (FRN, 2013) include, among others, provision of trained manpower in the applied sciences, technology and business particularly at craft, advanced craft and technical levels as well as giving training and imparting the necessary skills to individuals for economic self reliance.

According to Atsumbe, Raymond and Mele (2012), to facilitate the achievement of these objectives, the curriculum of Basic Technology programme in the first year covers technical drawing, materials, workshop practice, energy, electricity, machines, introduction to maintenance and simple agriculture. Progressively; the scope is widened by the second and third years of the study to include metalwork, building technology. From the context of this subject, these students are expected to be necessarily exposed in relation to their different areas of specialisation. Atsumbe, Raymond and Mele further

explained that from the nature of the subject, its teaching requires an interdisciplinary approach. It follows that teachers who actually implement the curriculum of Basic Technology ought to be well prepared. In other words, the teaching of this subject requires teachers who can demonstrate competencies desirable for intellectual growth of students, provide the students with foundations for advanced study in technology education and above all, they ought to provide activities that will contribute to each student becoming an effective citizen capable of making sound economic judgment.

This is in line with the argument that teacher quality is a strong predictor of students' quality. More so, since it is widely acknowledged that no educational system can rise above the quality of its teachers (FRN,2013), there is therefore great need to ensure that adequate and quality teachers are now handling the subject in our various secondary schools. This calls for upgrading of their competency needs through training and retraining from time to time. This will ensure effective teaching of the subject in Junior Secondary Schools in Nigeria, particularly those in Cross River State.

Theoretical Framework

Two theories constitute the theoretical framework of this study. These are Social Learning Theory and Kaufman's Mega planning theory of Needs Assessment.

Social Learning Theory by Albert Bandura (1977)

According to McLeod (2011), the social learning theory was propounded by Albert Bandura in 1977 and it stated that behaviour is learned from the environment through the process of observational learning. Lotz (2010) outlined the key tenets of the social learning theory as follows:

1. learning is not purely behavioural; rather, it is a *cognitive* process that takes place in a social context;

2. learning can occur by observing a behaviour *and* by observing the consequences of the behaviour (vicarious reinforcement);
3. learning involves observation, extraction of information from those observations and making decisions about the performance behaviour (observational learning or modelling). Thus, learning can occur without an observable change in behaviour;
4. reinforcement plays a role in learning but is not entirely responsible for learning;
5. the learner is not a passive recipient of information. Cognition, environment and behaviour all mutually influence one another (reciprocal determinism).

Palloff and Pratt (2007) maintained that social learning theory draws heavily on the concept of modelling or learning by observing a behaviour. According to McLeod (2011), Bandura believed that observational learning could not occur unless cognitive processes were at work. The researcher further stated that children observe the people around them behaving in various ways and these individuals that are observed are called models. These models provide examples of behaviour to observe and imitate, e.g. masculine and feminine, pro and anti-social, etc.

Johnson and Johnson (2009) posited that Bandura identified three types of modelling as follows:

- live model in which an actual person is demonstrating the desired behaviour;
- verbal instruction in which an individual describes the desired behaviour in detail and instructs the participant on how to engage in the behaviour; and
- symbolic in which modelling occurs by means of the media, including movies, television, internet, literature and radio. Stimuli can be either real or fictional characters.

This theory is very relevant to the present study. This is because teachers' professional development includes both cognitive and social aspects of learning. The cognitive aspects centred on teachers' knowledge while the social perspectives entails professional learning through participation. According to Watson (2012), the Social Learning Theory (SLT) by Bandura (1977) provided a theoretical approach that integrates cognitive aspects and social effects in learning. Watson maintained that teachers at the beginning of their careers observe and model the practice of other teachers, adapt them and reproduce them in the classroom. Feedback and response as well as self-assessment by the individual teacher influence the formation of their teaching behaviours. As time goes on, practices become largely routine. In other words, teachers observe the largely traditional teaching of more experienced colleagues and reconstruct knowledge from it until it becomes a safe and stable practice.

Kaufman's Mega Planning Theory of Needs Assessment

According to Watkins (2008), the Mega Planning theory of needs assessment was propounded by Roger Kaufman in 1980. The theory had two main postulations as follows:

(i) needs exist at the Mega (societal), Macro (organizational) and Micro (individual/team) levels;

(ii) needs are gaps in results.

Kaufman simply expressed this mathematically as Needs = Gaps in Results

This theory is equally very relevant to this study as it has emphasised the various levels of needs from the micro or individual level to the mega or societal level. This implies that the observed skills obsolescence of Basic Technology teachers in Cross River State does not exist at the level of the individual teachers alone but is also applicable to the education industry in all the local government areas in the state in

general. Thus, any improvement in the professional competencies of the teachers will not only be beneficial to them alone. It will equally be beneficial to the educational system in the entire zones that make up Cross River State. Furthermore, the postulation that needs exist as gaps in results relates to the performance of technical teachers. Thus, the gap between their present performance and their expected performance is the need that should be filled to enable them perform up to expectation. This would undoubtedly enable them to make considerable contributions to Cross River State economic and technological development.

Theoretical Studies

The Need for Effective Teaching of Basic Technology in Junior Secondary Schools

Effective teaching of Basic Technology in junior secondary schools as a matter of fact cannot be over emphasized. Basically, any society that wants to make a remarkable study in the technological ladder of the world could embrace with all amount of seriousness and commitment effective teaching of technology subject such as Basic Technology.

Unfortunately, the students' performance in Appendix B on page 147 showed that the students have not performed excellently in Basic Technology; this indicates deficiency in the teaching and learning process. This deficiency could be attributed to lack of result oriented competencies among others by technical teachers.

According to Uwameiye and Ogiegbaen as cited in Aremu (2015), Introductory Technology now Basic Technology is the only core subject among the prevocational subjects of the junior secondary schools in Nigeria, involves in 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. In fact, the study of Basic Technology helps to drastically reduce ignorance as regards technology,

these calls for its effective teaching at all levels. However, there exist need for effective teaching of Basic Technology judging from the fact that it gives opportunity to students to use tools and machines which are used in industrial process. This implies that as a practical oriented subject, practical application of day to day learning is enforced for proper technological awareness and skills development. 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 enhances a culture of peace, freedom and democracy.

Basic Technology deserves effective teaching in junior secondary school as rightly stated in National Policy on Education(FRN,2013), it is a compulsory subject in the 9-basic education programmes aimed at contributing to the achievement of the national education goals by inculcation of technology literacy, exposure of students to the world of work to march their talents and interests for wise vocational and inculcation of positive attitudes towards work as a source of human identity, livelihood and power.

Basically, effective teaching of Basic Technology in junior secondary schools requires competences apart from the use of appropriate teaching methods that are dynamic, practice-oriented and activity-based. Competences based on the subject matter are the first quality every technical teacher teaching Basic Technology must possess. In line with the foregoing, Gbamanga (2009) stated that a teacher must know the subject he is going to impart to the learners and that without a good background of the subject matter, the students will lose confidence in the teacher.

Generally, if technical teachers could effectively teach Basic Technology in Junior Secondary Schools using appropriate competencies, the students could definitely acquire tangible skills, abilities and knowledge with a view to adding observable values

to the development of the society. This justifies the need for effective teaching of Basic Technology in JSS.

Technical Teachers' Competency Needs

Teachers have been universally acknowledged (FRN, 2013) as the most important components of any education system hence they must possess relevant professional competencies. Teachers professional competencies refer to the techniques, methodologies and skills which the teachers acquire during professional training in teacher training institutions to enable them confidently and effectively impart knowledge and skills to the learner. The African Union (2007) observed that the delivery of quality technical and vocational education is dependent on the competency of the teachers. According to Akhyar (2000), competency refers to one's level of knowledge, skills and ability that result in superior performance. Similarly, Liou (2009) viewed competency as an underlying characteristic of an individual which is casually related to effective or superior performance in a job. Akhyar elaborated that competencies can be motives, traits, skills or a body of knowledge one uses.

UNESCO (2010) viewed competency as the proven or demonstrated capacity of an individual to use know-how skills, qualifications or knowledge in order to meet the usual and changing occupational situations and requirements. Selvi (2010) defined competencies as the knowledge, skills, attitudes, values, motivations and beliefs people need in order to be successful in a job. The European Higher Field of Education (2011) viewed competency as the conscious use of one's own knowledge, abilities, skills, talents, values, attitudes and behaviour patterns, in order to resolve issues and problems, overcome challenges, fulfilling one's duties and achieving the aims proposed.

The teachers of Basic Technology who have all the relevant competencies could be described as the competent teachers. The European Higher Field of Education (2011) defined competent teachers as those teachers who deploy their knowledge, abilities, skills, talents, values, attitudes and behaviour patterns to meet the challenges of educating their students. They possess the professional skills needed and are adequate to perform their assigned duties and attain the educational goals that the law requires. In other words, they must possess adequate professional competencies.

In stressing the need for competent teachers in all subjects, Akinsolu (2010) stated that:

> If they are apathetic, uncommitted, uninspired, lazy, unmotivated, immoral, and anti-social, the whole nation is doomed. If they are ignorant in their disciplines and thus impart wrong information, they are not only useless but dangerous. Therefore, the kind of teachers trained and posted to schools may well determine what the next generation will be like (p.2).

Several areas of teachers' competencies have been identified in educational literature. The delineation of these areas has however been fraught with inconsistency and controversy. Thus, while some scholars like Roberts, Dooley, Harlin and Murphy (2006) and Selvi (2010) grouped teachers competencies into few broad areas like instructional competencies, students' organization and facilitation competencies, school and community relations competencies, professionalism competencies, personal traits, field competencies, curriculum competencies, emotional competencies and information and communication technology competencies, others like Atsumbe, Raymond and Mele (2012) have narrow groups of competencies such as knowledge of subject matter or content knowledge, pedagogical skills, affective skills and students mentoring competencies. Similarly, Akhyak and Yunus (2013) identified basic teacher competencies to include pedagogical competency, personal competency, social

competency, and professional competency that is acquired through professional education.

The following competencies namely pedagogical, classroom management, information and communication technology, intrapersonal, interpersonal, affective work, laboratory/workshop management and instructional materials development and utilization which are identified as relevant to the present study are categorised into professional, technical and social/political competencies and are reviewed in this section. On professional competencies are discussed pedagogical, classroom management and instructional materials development and utilization competency needs of technical teachers. Technical competencies looked at information and communication technology and laboratory/workshop management competency needs of technical teachers. Discussions as regards social/political competencies are carried out under affective work, intrapersonal and interpersonal competency needs of technical teachers.

Professional Competencies needed by Technical Teachers

Professional competencies or core competencies are skills, knowledge and attributes that are specially needed by the professional associations, organizations and bodies connected to one's future careers. On the other hand, they are those capacities needed to perform a particular task with skills of acceptable quality. Contextually, on professional competencies are discussed pedagogical, classroom management and instructional material development and utilisation competencies.

Pedagogical Competency Needs of Technical Teachers

Pedagogy refers to the art and science of teaching children (Ogwo & Oranu, 2006). Pedagogical skills or competencies therefore refer to teachers ability to manage learning (Akhyak & Yunus, 2013). They are the skills teachers need to impart the specialized knowledge and content of their subject area to the students. Akhyak and Yunus

maintained that this competency involves the ability to plan teaching and learning programme, the ability to execute the interaction or manage the learning process, and the ability to make an effective assessment of students learning. Samba and Odo (2010) viewed teachers' pedagogical knowledge as consisting of general elements regarding teaching, classroom organization/ management, instructional models and strategies, classroom communication as well as the provision and utilisation of instructional materials. Samba and Odo stressed that to teach effectively, pedagogical knowledge and skills are considered indispensable because they influence their teaching in ways that will best enhance students learning and understanding. They explained further that teachers' pedagogical knowledge is an integration of subject matter content and contextual knowledge in ways intended to enhance students learning.

Akhyak and Yunus (2013) classified teachers' pedagogical competency into three broad groups namely; teaching plan competency, learning and teaching process competency, teaching assessment and evaluation competency. They identified the following as components of teaching plan competency: Having the ability of

(1) describing objectives correctly,

(2) selecting materials accurately,

(3) organizing materials effectively,

(4) determining learning methods and strategies,

(5) determining learning sources, media and tools,

(6) designing assessment and evaluation tools appropriately,

(7) determining assessment and evaluation technique, and

(8) allocating time adequately.

Learning and Teaching Process Competency includes;

(1) opening lesson appropriately;

(2) delivering materials effectively;

(3) using various methods effectively;

(4) using different teaching media accurately;

(5) using communicative language;

(6) motivating students;

(7) organizing activities logically;

(8) interacting with students communicatively;

(9) concluding lessons appropriately;

(10) providing feedback ; and

(11) using time effectively.

Learning, Teaching Assessment and Evaluation Competency includes ability of:

(1) conducting assessment and evaluation;

(2) choosing questions based on the level of difficulty;

(3) selecting questions based on the level of differentiation;

(4) checking the answer correctly;

(5) classifying the results of the assessment;

(6) processing and analyzing assessment results;

(7) making interpretation of the trend in assessment results;

(8) determining the correlation/ problem based on the assessment results;

(9) assessing to identify the level of variation in the results;

(10) inferring from the results of the assessment clearly and logically;

(11) arranging follow-up programme from assessment results;

(12) classifying students based on the assessment results;

(13) identifying the need for follow-up from assessment results;

(14) carrying out follow-up accurately;

(15) evaluating the results of follow-up; and

(16) analyzing the results of the evaluation.

Salihu (2014) categorized teachers' pedagogical skills into ten broad areas of teaching performance. Salihu maintained that each of the broad areas of teaching performance could further be divided into measurable components, which could be observed and evaluated. They include lesson planning and presentation, content knowledge and relevance, instructional methods, selection and use of instructional materials as well as creating a conducive educational climate for learning. Others include variety of instructional activities, opportunity for students' participation, instructors-students interaction, communication and assessment.

Pedagogical knowledge enables the teacher to have a good understanding of the learner, interaction with peers, and the effect of that in teaching and learning effectiveness. According to Highland Council cited in Salihu (2014), pedagogical knowledge and skills enable teachers to develop a repertoire of best practices, which contribute to effective teaching. These include, the ability to:

- provide learners with clear tasks, goals and requirement and inform them of progress made. A key skill in teaching is the ability to explain and describe things clearly;
- encourage the students to think, to make connection, to practice and reinforce, to learn from other learners, and to feel that if they make mistakes they will not be ridiculed or treated negatively;
- promote students' participation through problem solving, questioning, and discussion, and "buzz group" activities;
- treat all students' questions seriously and do not intimidate or ridicule;

- use regular informal assessment strategies including a range of types of questioning, observation, and reasoning in;
- understand that since individuals learn at different rates and in different ways, there is the need to provide a variety of activities, tasks and peace of work, and monitor and evaluate students' progress;
- use break and activities to engage students' thinking and interest; and
- work in a share and collegial way with other staff.

The implication of this proposition is to facilitate effective teaching. Teachers require not just the knowledge of their subject matter, but the knowledge and skills of how to impart this knowledge to students. Teachers need to understand their learners, their uniqueness, and their learning needs. They need to create supportive, self, and engaging learning environments where all learners have the opportunities to develop their full potentials. Teachers need to understand and integrate assessment, planning, and instructional strategies with coordinated and engaging ways that facilitate effective student learning.

In stressing the importance of pedagogical skills, Monk (2004) stated that a teacher's subject matter expertise supports students learning up to a point, but pedagogical knowledge and skills appear to have a substantial value-added influence on students' achievement. This view is corroborated by the Organisation for Economic Cooperation and Development (OECD, 2009) who posited that to teach effectively, teachers need to demonstrate a variety of pedagogical skills that aids students understanding.

Moreover, the African Union (2007) noted that the delivery of quality technical and vocational education is dependent on the competency of the teacher; competency measured in terms of theoretical knowledge, technical and pedagogical skills, as well as

being abreast with new technologies in the workplace. This view is supported by Darling-Hammond and Brandsford (2005) who maintained that the effectiveness of Technical and Vocational Education and Training (TVET) depends largely on the quality of the teacher and the instructional techniques used in lesson delivery. The authors also emphasised that theoretical and pedagogical knowledge alone do not translate into effective teaching without the teacher's ability to apply them appropriately in the teaching and learning situation.

Research studies (Darling-Hammond & Brandsford, 2005) have shown a positive association between students' achievement and teachers' academic skills and level of content knowledge. Similarly, Hill, Rowan and Ball (2005) found that students' achievement correlates positively with the teachers' pedagogical knowledge and skills. Indeed, many instructional problems and poor students' achievement are associated with ineffective teaching resulting from poor teaching strategies. Strong (2007) reported that teachers with little or no coursework in education consistently had difficulties in the areas of classroom management, curriculum development, students' motivation and specific teaching strategies. They were also less able to anticipate students knowledge and potential difficulties, or to plan and redirect lessons to meet the individual need of the students.

According to Dilworth, Aguerrebere and Keller-Allen (2006), teachers with poor pedagogical knowledge and skills tend to present their lessons as if all students were the same, that they enter school with similar starting points and background, that they progress at predictable and similar rates, and that all a teacher needed was the ability to deliver knowledge to a waiting audience. A key task of an effective teacher, however, is to have a good knowledge of the students, have a sense of the students' community, and use this knowledge of the students to develop strategies that utilise the students'

background as a starting point, and a possible strength upon which to build towards success (Dilworth, et al., 2006). They maintained that effective teachers should expect all their students to reach a high learning goal, and should be armed with various strategies for helping the students to achieve, realising that every student starts at a different place and may require different path to accomplish the same goal. To help all students learn, teachers need several kinds of knowledge about learning. They need to think about what it means to learn different kinds of material for different purposes and how to decide which kind of learning are most necessary in different contexts. Teachers must be able to identify the strengths and weaknesses of different learners and must have the knowledge to work with students who have specific learning disability or needs. Teachers need to know about curriculum resources and technologies to connect their students with sources of information and knowledge that allow them to explore ideas, acquire and synthesize information, and frame and solve problems. Furthermore, teachers need to know about collaboration- how to structure interactions among students so that more powerful shared learning can occur; how to collaborate with other teachers; and how to collaborate with parents to learn more about their children and to shape supportive experiences at schools and at home (Shulman, 2002).

A model of pedagogical reasoning was developed by Shulman (2002) which comprises a cycle of several activities that a teacher should complete for good teaching. A teaching session will require the teacher to incorporate several activities, which will combine to help teaching effectiveness. These activities which are reinforced by the teachers' level of pedagogical knowledge and skills, work to shape and improve teaching effectiveness.

Classroom Management Competency Needs of Technical Teachers

It is widely agreed among scholars that effective classroom management is a requirement for effective education. This is because effective teaching and learning cannot take place in poorly managed classrooms. This explains why classroom management is very important. Korpershoek, Harms, De-Boer and Doolaard (2014) defined classroom management as the actions teachers take to create a supportive environment for the academic and social-emotional learning of students. Classroom management can also be viewed as the process by which teachers and schools create and maintain appropriate behavior of students in classroom settings (Los Angeles county Office of Education, 2000). This source maintained that the purpose of implementing classroom management strategies is to enhance pro-social behaviour and increase students' academic engagement. Oliver and Reschly (2007) viewed classroom management as all the actions taken to create and maintain a learning environment conducive to successful instruction (arranging the physical environment, establishing rules and procedures, maintaining students' attention to lessons and engagement in activities)".

Kratochwill, Deroons and Blair (2014) described classroom management as a term used by teachers to refer to the process of ensuring that classroom lessons run smoothly despite disruptive behaviour by students. They maintained that the term also implies the prevention of disruptive behaviour. All these definitions emphasize the importance of actions taken by the teacher to facilitate learning among the students. In a nutshell, classroom management refers to the wide variety of skills and techniques that teachers use to keep students organized, orderly, focused, attentive on task and academically productive during a class (Great Schools Partnership, 2014). This source explained that when classroom-management strategies are executed effectively, teachers minimize the behaviors that impede learning for both individual students and groups of students, while

maximizing the behaviors that facilitate or enhance learning. Generally speaking, effective teachers tend to display strong classroom-management skills, while the hallmark of the inexperienced or less effective teacher is a disorderly classroom filled with students who are not working or paying attention.

Oliver and Reschly (2007) stated that research shows that a high incidence of classroom disciplinary problems has a significant impact on the effectiveness of teaching and learning. In this respect, it has been found that teachers facing such issues fail to plan and design appropriate instructional tasks. They also tend to neglect variety in lesson plans and rarely prompt students to discuss or evaluate the materials they are learning. According to Kratochwill, Deroons and Blair (2014), a well-organized classroom is a classroom in which students know how to effectively make use of the classroom and its resources. Some of the teaching objectives focus on expected academic behaviours, appropriate use of materials and learning centres and cooperation with peers. So, teacher should play a role to create a community of learners where students play an active part in forming their environment, understand their role as students and learn how to work effectively as an individual and with peers. All actions taken by the teacher should be focused on minimizing disruptions and fostering an environment where students can learn.

Korpershoek, Harms, De-Boer and Doolaard (2014) identified five types of actions which teachers usually take in order to attain a high quality of classroom management. These include: (1) developing caring and supportive relationships with and among students and (2) organizing and implementing instruction in ways that optimize students' access to learning. (3) encouraging students' engagement in academic tasks, which can be done by using group management methods (e.g., by establishing rules and classroom procedures). (4) promoting the development of students' social skills and self-

regulation. (5) using appropriate interventions to assist students with behavior problems. The last two actions indicate that effective classroom management improves students' behaviour. Hence, classroom management is an ongoing interaction between teachers and their students.

According to the Great Schools Partnership (2014), classroom management is closely linked to issues of motivation, discipline and respect. In supporting this view, Sieberer-Nagler (2016) noted that maintaining effective discipline in class which is an integral part of classroom management serves four purposes namely;

1. it shows students what they should have do to.
2. it gives students as much ownership of the problem as they are able to handle.
3. it gives students options for solving the problem.
4. it leaves students with their dignity intact.

Discipline is therefore an action taken on the part of the teacher to enforce rules and respond to student misbehavior. Students do things on purpose that they know they should not do. According to Gootman (2008), a large part of traditional classroom management involves behavior modification, although many teachers see using behavioral approaches alone as overly simplistic. Many teachers establish rules and procedures at the beginning of the school year. In addition, rules give students concrete direction to ensure that our expectation becomes a reality.

Asia University (2014) stated that managing a class effectively is one of the biggest challenges faced by teachers. If teachers do not have an effective plan in place, there will not be much opportunity for students to engage in meaningful learning experiences. Thus, teachers will find themselves refereeing instead of teaching. This underscores the need for teachers to possess relevant classroom management competencies.

In stressing the importance of classroom management, Korpershoek, Harms, De-Boer and Doolaard (2014) pointed out that a well-organized classroom is a classroom in which students know how to effectively make use of the classroom and its resources. Some of the teaching objectives focus on expected academic behaviours, appropriate use of materials and learning centres and cooperation with peers. So, teachers should play a role to create a community of learners where students play an active part in forming their environment, understand their role as students, and learn how to work effectively as an individual and with peers. All actions taken by the teacher should be focused on minimizing disruptions and fostering an environment where students can learn.

Oliver and Reschly (2007) noted that the goals of classroom management can be many, but, the two most common ones are to create and maintain a positive, productive learning environment and to support and foster a safe classroom community. The author explained that the goal of creating and maintaining a positive, productive learning environment is not meant for absolute control or to create an inert, docile, and totally compliant classroom and student body. Rather, an effective classroom management is to maintain students' interest, motivation and involvement. Thus, the focus is on activities that create positive, productive and facilitative learning environment.

With respect to the second goal of classroom management which is to support and foster a safe classroom community, Brophy (2006) explained that it means that students are allowed to make the connections needed for learning to take place. Each student needs to feel comfortable enough to discuss their previous understanding without fear of being ridiculed for their misconceptions. In order to make the students comfortable enough to take these intellectual risks, it is necessary to set up the rules and routines which:

- The rules and routines will give them a structure in which to interact with the teacher and each other.

- The rules and routines need to be necessary, fair and specific if the students are to be expected to follow them.
- Each rule or routine should come with a verbal or written description of why the rule is needed. If the rule is too vague on its own, examples should be given.

Classroom management strategy will not work if a teacher does not know his/her students. If the teacher takes the time to get to know the students, he or she can not only plan management issues better, but can also minimize disruptions in a more personal way. This has the added benefit of letting the students know that you care about them as people as well as students.

The Los Angeles County Office of Education (LACOE, 2000) identified the following as common classroom management skills teachers should possess.

i. Ability to prevent problem behavior;
ii. Ability to reduce the use of punitive methods of control;
iii. Ability to address academic failure experiences;
iv. Ability to provide clear rules for student conduct and discipline;
v. Ability to use appropriate behavior management procedures;
vi. Ability to manage the physical environment judiciously;
vii. Ability to make good seating arrangements;
viii. Space utilization ability;
ix. Ability to develop and enforce classroom rules;
x. Ability to use reinforcers such as recognition, rewards, and motivators;
xi. Ability to provide attention/recognition;
xii. Ability to identify reinforcers for the hard-to-motivate students;
xiii. Ability to use a variety of reinforcers; and
xiv. Ability to eliminate, reduce or override reinforcers for the problem behaviour.

Similarly, Kratochwill, Deroons and Blair (2014) identified ability to manage the classroom environment, the physical space, furnishings, resources and materials as well as students' attitudes and emotions properly as other classroom management skills teachers should possess. Some of these classroom management skills might be needed by technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State.

Instructional Materials Development and Utilisation Competency Needs of Technical Teachers

It is widely believed among educational experts that the primary role of every teacher is to impart worthwhile knowledge, skills, values attitudes and competencies to the students. To achieve this laudable objective, the teacher has to use a variety of instructional materials or resources. Benito (2012) defined instructional materials as the textbooks, library acquisitions, supplemental materials for classroom use, and any other instructional materials, including electronic resources, used for formal or informal teaching and learning purposes. This source added that the primary objectives of instructional materials are to deliver, support, enrich and assist in implementing the school's educational programme.

Olawale (2013) viewed instructional materials as all the audio, visual and audio-visual materials, including printed and non printed as well as electronic and non-electronic resources that the teacher and the whole class uses for the purpose of making abstract concepts more concrete thus making teaching and learning more effective. Olawale added that it also refers to materials which the teacher uses in supplementing his teachings. Examples of instructional materials are charts, maps, diagrams, comics, models, globes, slides, film strips, television, radio cassettes, video, recorders, cinema, public address system, laboratories and museums, flash cards, flannel boards, card boards, calendar and computers.

There are three main classes of instructional materials namely audio, visual and audio-visual resources. According to Umaru (2011), the audio materials are those instructional materials that can only be heard. That is, they only produce sound sensation while the visual resources are those instructional resources that can be clearly seen vividly with the eyes. That is, they only produce pictures or images. Examples are chalkboard, textbooks, charts, model, specimens, workshop hand tools, machine tools and workshop equipment. The audio-visual resources are those that can be heard and seen simultaneously. Thus, they produce both sound and pictures which appeal to the senses of hearing and sight at the same time. Examples of audio visual resources include tapes, video, television, projectors and motion pictures. There are various other ways of classifying instructional resources but for the purpose of simplicity, instructional resources for teaching in Basic Technology can be classified as follows:

(i) Printed and reference resources: these include textbooks, newspapers, magazines, government documents, teachers' guide, duplicated materials, journals, hand book, bulletins, pictures, work books, pamphlets and leaflets.

(ii) Graphic resources: Graphs, charts, diagrams, maps and globes.

(iii) Display resources: Chalkboard, white boards, bulletin boards, magnetic boards and flannel boards.

(iv) Projected resources – television, video tape, overhead projector, slides and slide projector and transparencies.

(v) Non-projected resources: this include flat pictures, wall charts, models, specimens,

(vi) Audio resources: Radio, model, computer, tape recording, etc.

(vii) Technology resources: These include Over head projectors, Television, Video Cassette Recorder, Video Projector, Digital Cameras, Scanners, Telephone,

Radio, Tape recorder, Computer and CD player. Others are Slide projector, Film strip projector, Simulators, Electronic board, Interactive television, World Wide Web and the Internet as well as Local area network (LAN).

In addition to the above, there are other technology-based resources generally described as Open Educational Resources (OER). According to Tuomi (2006), Open Educational Resources refer to open source software or computer software whose human-readable "source code" is published with a copyright that explicitly allows anyone to copy, modify and redistribute the code and its modifications without paying royalties or fees. In other words, Open Educational Resources refer to the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes. In a nutshell, Open Educational Resources (OER) describe any educational resources (including curriculum maps, course materials, textbooks, streaming videos, multimedia applications, podcasts and any other materials that have been designed for use in teaching and learning) that are openly available for use by educators and students, without an accompanying need to pay royalties or license fees (Commonwealth of Learning, 2015).

Most educators generally agree that the creative use of variety of instructional materials will increase the probability that students would learn more, retain better and bring about the skills they are expected to perform. Olawale (2013) noted that apart from their ability to process meaningful sources of information, instructional resources help the teacher with the means for extending his horizon of experience as well as providing the teacher with rich sources of procuring communicative materials which could be produced jointly by the teacher and the students. This position is shared by Gujjar and Malik (2007) who posited that several studies conducted to test the value of instructional materials and other sensory devices have proved that instructional resources when

properly used in teaching learning situations can accomplish a lot of complex tasks. They added that instructional resources also offer real experiences in giving the teacher basis for thinking and understanding. They also supply concrete basis for conceptual thinking and therefore reduce meaningless responses of students.

Moreover, instructional resources enable teachers to overcome the limitations of time, space and size by helping the students to understand things that are too small or too big, or too slow or too fast (Mazgon and Stefanac, 2012). In addition, instructional resources can provide members of a group with a common or joint experience. They also break language barriers and ease difficulties and in the end make the lesson more meaningful. Furthermore, instructional resources save time and thus enable students grasp ideals more effectively and faster (Igu, Ogba and Igwe, 2014). Likewise, they help to simplify and emphasize facts and clarify difficult concepts (Oladejo, Olosunde, Ojebisi and Isola, 2011).

It is pertinent to point out that the teacher should be skilled in the development and utilization of all the above listed instructional materials. The instructional materials development and utilization competencies of technical teacher can therefore be said to fall into two main dimensions: competency in the development of instructional resources and competency in utilization of instructional resources. One of the skills associated with the development of instructional resources is improvisation. According to Samba and Odoh (2010), improvisation is the substitution of other materials in place of the real object to facilitate teaching thereby helping learners to understand the subject matter. This source explained that improvisation is also the art of using alternative materials/ equipment obtained from local resources in place of the original materials/equipment. In other words, improvisation can be seen as a process whereby some standard and expensive materials/equipment are replaced by locally made ones either by the teacher

or someone being employed by the teacher to do so. The implication of this is that the technical teacher must be competent in the art of improvisation since improvisation is borne out of the necessity of having necessary instructional resources for effective teaching.

Olawale (2013) noted that instructional resources utilization skills entails the use of tools of technology as well as a systematic, integrated organization and maintenance of the machines, hardwares and softwares and other instructional resources. They added that in order to ensure effective teaching learning process, it is important for every teacher to develop competencies in the utilization of the instructional resources available to him or her. Udo, Ntuk and Ekanem (2003) posited that teachers should be competent in the use of display resources such as chalk boards, pocket charts and flannel boards. They added that teachers should develop skills in the use of other instructional resources such as wall charts, flash cards, posters, graphic materials, flat pictures, projected and non projected resources as well as three dimensional instructional resources. Obviously, some of these instructional materials development and utilization competencies might be needed by technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State.

Technical Competencies Needed by Technical Teachers

Technical competencies are behaviours directly related to the nature of training and the technical proficiency required to exercise effective control and are closely aligned with knowledge and skills or “know how” needed for successful performance. Also, they are knowledge and capabilities to perform specialized tasks. On technical competencies are discussed information and communication technology and laboratory management competencies.

Information and Communication Technology Competency Needs of Technical Teachers

Information and communication technology (ICT) competency relates to the use of Information and communication technology equipment for teaching, distribution and transfer of knowledge. According to Austin (2010), Information and Communication Technology is defined by the Nigerian National Policy for Information and Communication Technology (2001) as computer, ancillary equipment, software and firmware (hardware) and similar procedures, services (including support services) and related resources, any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, transmission or reception of data or information. In Education, ICT refers to the combination of technologies for collecting, storing, processing, communicating and delivering information. Austin added that Information and Communication Technology designates the computing and communication facilities and features that variously support teaching, learning and a range of activities in education and other areas of human endeavours. Such ICT related activities include, for example, the use of:

- broadcast material or CD-ROM as source of information in history;
- micro-computers with appropriate keyboard and other devices to teach literacy and writing;
- keyboards , effects and sequencers in music teaching;
- e-mail to support collaborative writing and sharing of resources;
- video-conferencing to support the teaching of modern foreign language;
- internet-based research to support geographical enquiry;
- communications technology to exchange administrative and assessment data.

Austin (2010) identified the following as some of the ICT skills needed by teachers:

1. knowing the parts of the computer;
2. develop Hand – Eye Co-ordination skill;

3. the skill of using left button on the mouse;
4. the skill of keyboarding; and
5. printing skills.

The researcher added that these skills could be applied in education in the areas of pedagogy, class management and administration. Similarly, Office of Grant Programmes and Technology (2001) noted that to use technology as a meaningful learning tool, educators need to understand the advantages technology can provide for grade levels and content areas. They added that a more fully developed awareness of technology encompasses the concepts of networks, roles, resources and emerging technologies. They further identified the following as ICT skills teachers need:

(a) competency in demonstrating an understanding of research and potential applications of educational technology as it impacts students' learning and instruction;
(b) being aware of and ability to identify various technology resources needed to structure effective learning environments;
(c) competency in incorporating a variety of technology tools to enhance teaching and learning on a daily basis;
(d) apply problem solving strategies to issues involving teaching and learning with technology;
(e) demonstrate awareness of network capabilities and electronic communications;
(f) demonstrate awareness of emerging technologies;
(g) skills in using various hardware, software and learning devices, including touch screen, input devices and voice recognition;
(h) skills in using technology to collect and analyze data that informs my educational practice; and

(i) skills in using technology to assess students' learning and support student and teacher self-assessment through electronic record-keeping, portfolios and the students' performance standards.

Moreover, UNESCO (2003) identified the following as common ways of using ICT in teaching and learning: Audio cassette tapes, radio, videotapes, CD-ROM and DVD and internet/web based training. Others are audio conferencing, audiographies, interactive television and video conferencing. They added that ICT can be used in Technical and Vocational Education and Training (TVET) for many purposes such as administration, career education and guidance for providing labour market information, for placement of TVET graduates. Others include for information search, for control of technical systems and for communication purposes. The implication of this is that the technical teacher should be competent in the use of ICT for all these purposes.

While emphasising the need for technology teachers to acquire sufficient ICT skills, Ruhland and Bremer (2002) stated that the transformation of classroom technology from hardware, software, and connections into tools for teaching and learning depends on knowledgeable and enthusiastic teachers who are motivated and prepared to put technology to work on behalf of their students, Yet, many teachers do not have the technical knowledge or skills to recognize the potential for technology in teaching and learning. Just knowing how to use a computer is not enough. Instead, teachers must become knowledgeable about technology and self-confident enough to integrate it effectively in the classroom. Teachers must become "fearless in their use of technology" and empowered by the many opportunities it offers. Most teachers want to learn to use educational technology effectively, but they lack the time, access and support necessary to do so.

Similarly, the North Central Regional Educational Laboratory (NCREL, 2009) noted that to reach the goal of preparing teachers for effective technology use, a well-designed professional development programme is essential. It added that professional development in a technological age requires new definitions and new resources. It cannot take the traditional forms of individual workshops or one-time training sessions. Instead, it must be viewed as an ongoing and integral part of teachers' professional lives. NCREL further pointed out that professional development should contain all the necessary components that research has found to be important. These components include the following: a connection to student learning, hands on technology use, variety of learning experiences, curriculum-specific applications, new roles for teachers, collegial learning, active participation of teachers, ongoing process, sufficient time, technical assistance and support, administrative support, adequate resources, continuous funding and built-in evaluation.

Laboratory/ Workshop Management Competency Needs of Technical Teachers

According to Schlautman and Silletto (1992), laboratory learning has long been associated with vocational-technical education. In the school laboratories, students learn by doing which is an integral part of vocational-technical education programmes. In recognition of the importance of workshops in the teaching of technical education subjects, the Federal Government of Nigeria, during the erstwhile 6-3-3-4 system of education which introduced Introductory (now Basic) technology into the junior secondary school curriculum, established introductory or basic technology workshops in many secondary schools in Nigeria.

A workshop, according to Umar and Ma’aji (2009) is a place where students carry out practical activities and projects. It is the venue where the theoretical lessons given in the classroom are complemented with practical exercises and projects (Ogwo & Oranu,

2006). Umar and Ma'aji (2009) underscored the importance of the school workshop by stating that it offers opportunity for the practical training of students thus facilitating skill acquisition in their respective trade areas.

Laboratory or workshop management, according to Olaitan, Nwachukwu, Igbo, Onyemachi and Ekong (1999) is the process of planning, organising, designing, arranging, setting up, remodeling, renovating and expanding the laboratory or workshop. They explained that this involves procuring and maintaining equipment, procurement and distribution of consumable materials to students for practice, arrangement and utilization of physical facilities, keeping the workshop orderly as well as proper organization of students.

The major concern of every laboratory or workshop management, according to Ogwo and Oranu (2006), is the identification and judicious utilization of available resources to achieve the objective of helping the learners to learn and acquire the necessary skills and competencies in their chosen occupation. This implies that in every laboratory or workshop, tools and equipment needed to provide various skills should be made available and should be in constant use for the staff and students. They should also be kept in a good condition and control. Ogwo and Oranu further stated that when a laboratory or workshop is clean and bright with tools and machines located in their proper places, it will give an impressive look to facilitate instruction and effectiveness in learning.

Olagboye (2008) maintained that effective workshop management is very important for the following reasons. Firstly, its proper maintenance ensures safety for those occupying the school building. Secondly, it facilitates teaching and learning process. Thirdly, it saves costs. Moreover, it ensures the suitability of school workshop building as well as the tools and equipment for continued use. Lastly, it reduces students' unrest and demonstration because students can protest or demonstrate when technical

workshops are not well managed and maintained. The need for effective management of the school workshop in any educational institution at all levels of the educational system; particularly at the secondary school level is very important. This point to the fact that the technical teacher must possess effective laboratory or workshop management competencies.

Johnson and Schumacher (1989) defined laboratory management competencies as those abilities needed by teachers to direct, conduct or administer a vocational technical education laboratory. They maintained that the main functions of the teacher as laboratory manager is to plan, execute, and manage day-to-day laboratory operations to ensure proper functioning of the laboratory and the quality of laboratory services. Johnson and Schumacher added that in most institutions, the laboratory manager typically serves as a member of management and is considered a senior level personnel within the organization because the manager provides functional, technical or process leadership.

Sheckle (2012) listed the following as the major responsibilities of the teacher as laboratory manager:

- foreseeing, planning and implementing overall laboratory activities;
- ensuring the efficiency and effectiveness of departmental operations;
- developing and implementing laboratory guidelines and policies; maintains new materials and equipment;
- overseeing and developing laboratory personnel training;
- instructing, supervising and managing technicians to conduct proper experimental practices;
- carrying out and leading research projects; and

- mentoring and supervising laboratory members in achieving research project tasks.

In stressing the need for effective laboratory management skills by teachers, Ogwo and Orannu (2006) stated that good laboratory management procedures enable students to exercise self control in obeying laboratory safety rules and also influence the amount of time that students are actively engaged in meaningful laboratory work. They added that good laboratory management presupposes that teachers as laboratory managers must prepare properly the environment where practical work is to take place. They concluded that since teachers cannot change the design of the school laboratory in the short run, the only option is for them to make good use of what is available. Similarly, Schlautman and Silletto (1992) stated that effective scheduling and management of the laboratory is a must for carrying out an effective instructional programme.

Ogwo and Oranu (2006) identified tool management as one of the basic laboratory management skills needed by technical teachers. They emphasised that in view of the increasing cost of materials coupled with the decline in the purchasing power of the Nigerian currency (the Naira), the need for effective and prudent management of the tools and supplies becomes very important. They identified the following as laboratory management skills needed for effective tool management in technical education laboratories: Skills in:

1. ensuring that all tools and materials needed for any practical lesson are made available before the commencement of the lesson;
2. ensuring that safety rules are kept;
3. ensuring that time is used judiciously;
4. cleaning and oiling tools and equipment at the end of the day's work;
5. returning used tools to their appropriate storage places;

6. documentation of all supplies;
7. arranging tools and equipment neatly so that they can be easily identified and used;
8. monitoring and supervising the use of materials, equipment and tools;
9. good housekeeping;
10. keeping manufacturers manuals as a reference for using and servicing of equipment; and
11. carrying out preventive maintenance in order to prolong the service life of tools in the laboratory.

Social/Political Competencies needed by Technical Teachers

Social/political competencies involve ability to understand what someone can and cannot control. They consist of social, emotions, cognitive and behaviour skills needed for successful social adaptation. In this context, social/political competencies looked at affective work, intrapersonal and interpersonal competencies.

Affective Work Competency Needs of Technical Teachers

Affective work competencies are the socio-psychological characteristics such as work attitudes, values and habits that a person demonstrates at the workplace (Amuka, 2002). It simply refers to the manifestation of desirable work behaviours that persons demonstrate. Atsumbe and Saba (2012) viewed affective work skills as non technical abilities, employability skills and work ethics. They noted that affective work skills includes work ethics, which according to Petty (2006) referred to sets of values based on the normal virtues of hard work and diligence. It is also a belief in moral benefit of work and its ability to enhance character. Work ethic may include being reliable, having initiative or maintaining social skills.

In stressing the need for affective work competencies or work ethics, Atsumbe and Saba (2012) noted that one of the main purposes of Technology Education programmes is to help individual students to develop desirable affective work attitudes, acquire the necessary knowledge and skills of an occupation to enter and progress in the occupation. Indeed, the Federal Government of Nigeria (FGN, 2013), in the National Policy on Education gave two affective objectives of Nigerian education. These are; the inculcation of national consciousness and national unity and the inculcation of the right type of values and attitudes for the survival of the individual and the Nigerian society. This implies that education should lead not only to the acquisition of cognitive and psychomotor skills but also to the development of appropriate attitudes. This therefore underscores the need for Basic Technology teachers to acquire affective work skills so that they can transmit same to their students.

Amuka (2002) stressed the importance of affective work skills by stating that affective work competencies have become primary considerations for workers at various stages of their employment such as when entering the job market, for sustaining employment and for gaining job promotions. The author pointed out that nearly 87% of people who lose their jobs or who fail to be promoted is attributable to having improper work habits and attitudes. Ogwo and Oranu (2006) further underscored the importance of affective work skills by stressing that the affective skills possessed by a worker determine to a great extent the prospects of occupational success. They added that improper work habits and attitudes account for the loss of employment by most youths as well as their inability to get promoted.

Similarly, Miller and Usoro (1991) pointed out that one of the major reasons many young men loose their jobs is as a result of poor attitudes to work and lack of work related interpersonal skills. In supporting the views of Miller and Usoro, Nelson (1997) reported

that several young technicians in America are thrown out of job not because they are practically or theoretically unfit, rather because they lack manners and interpersonal skills. They further maintained that several of these young workers did come late to work, drunk and demonstrate a high level of stubbornness. As a result of this unruly behaviour many industries and factories are unable to meet production target. Many young workers lack these non-technical competencies that are associated with characteristics of occupation such as interpersonal relationship with peers and supervisors, work rules and job findings.

Ogwo and Oranu (2006) therefore advocated the inclusion of affective work skills in technical and vocational education curriculum and pointed out that teachers have the responsibility of identifying relevant attitudes for a particular trade/course of study and to teach students to form the right behavior pattern during the early stages of training. Also, Atsumbe and Saba (2012) advocated the need for technology education to teach affective work skills when they stressed that any education that does not promote the right value and attitude to work, life and the society is of limited value. They further emphasised that developing desirable work attitude is imperative for success in the world of work. This is so because industries where these graduates work, make use of complex machines, that require workers that are emotionally stable, workers that are obedient and are ready to take instructions from superiors.

Moreover, Shalem (2012) noted that work-related social skills and habits are the most important entry-level skills sought from employees. Shalem stressed that dependability and proper attitudes were ranked highest in a recent study. The researcher stressed that cognitive and psychomotor skills may not be as important for job survival as is positive work ethics and values. However, over 50% of youths leave school not knowing how work-related social skills affect their ability to find and keep a job.

Because teaching touches all lives, the teaching of work ethics is vitally important. Yet, little data exists on exactly what technology and industrial educators should teach. This further justifies the need for identifying the affective work skills that technical teachers in Cross River State would need for effective teaching of Basic Technology. Shalem therefore suggested that certain types of work values and attitudes should be taught and listed the most frequently taught values and attitudes as punctuality, dependability, reliability, responsibility, dedication, honesty, conscientiousness, ambition, cooperativeness, helpfulness, adaptability, and resourcefulness. Similarly, Schultz (nd) listed other affective work skills to include responsibility, etiquette and good manners, courtesy, self-esteem, sociability, integrity and honesty

Amuka (2002) identified 15 competency clusters of the affective work competency inventory developed by Kazanas (1978) which are considered by educators and industry as desirable characteristics in employees. These characteristics include being ambitious, co-operative, adaptable/resourceful, independent/initiative, accurate/quality of work, pleasant/friendly and following directions. Others are being careful, considerate/courteous, emotionally stable, persevering, neat/orderly, dependable/punctual, efficient/speedy and conscientious/loyal.

While emphasising the need for work-related social skills and habits, Miller (nd) stated that work-related social skills and habits are the most important entry-level skills sought by employees. This source noted that cognitive and psychomotor skills may not be as important for job survival as is positive work ethics and values. Miller also pointed out that over 50% of youths leave school not knowing how work-related social skills affect their ability to find and keep a job because the teaching of work ethics is not vitally important. Miller attributed this to non existence of adequate data on exactly what work-related social skills and habits that technology and industrial educators should possess as

well as teach their students. This further underscores the need for identifying the affective work competencies that Basic Technology teachers in Cross River State should need for effective performance of their duties.

Intrapersonal Competency Needs of Technical Teachers

The term "intrapersonal" means something which happens within an individual (Ekong, 2013a). Thus, intrapersonal competencies relate to a teacher's knowledge of oneself (personal skills and values). Ekong (2013a) maintained that an intrapersonal skill simply entails understanding oneself. According to Scherer (2007), intrapersonal competencies can be conceptualized as the attitudes and behaviors that influence how individuals apply themselves in school, work and a range of other settings. For example, being motivated leads to better performance in a number of contexts and on a variety of tasks. Increasingly, educators believe that improving intrapersonal competencies is key to maximizing student potential.

Goleman, Boyatzis and Mckee (2002) divided the intrapersonal competencies in two categories, namely self-awareness and self-management. Self-awareness competencies comprise emotional self-awareness, accurate self assessment, and self-worth which is an indication of a strong and a positive sense of self-worth. Self-management is characterized by self-control, trustworthiness, conscientiousness, adaptability, achievement, orientation and initiative which clearly suggest a readiness to seize opportunities. Udoudo and Maigida (2013) identified the following as intra-personal competencies:

1. self awareness - the ability to accurately perceive, identify, understand and evaluate one's personal feelings;
2. self-assessment- the ability to know one's strengths and limitations;

3. self confidence - the ability to have a strong sense of one's self value and talents in his specific area of profession;
4. emotional self control- ability to keep reckless feelings and worrying emotions under control;
5. transparency-ability to maintain standards of honesty and integrity;
6. adaptability- ability to be flexible in handling change;
7. optimism- ability to be persistent in pursuing goals despite obstacles and set backs;
8. initiative – ability to be ready to act on opportunities; and
9. achievement – ability to always try hard to meet a standard of excellence.

Similarly, Ekong (2013a) identified intra-personal communication and critical thinking as the basic intrapersonal skills needed by teachers for effective teaching.

Selvi (2010) maintained that teachers' intra-personal competencies are very important as it can help students to learn and also help teachers become effective teachers. According to him, learning is an emotional activity hence students willingness to learn can be increased if teachers know how to improve the emotional dimension of students learning. In addition, learning requires an emotional support that creates positive feelings for learning-teaching process.

Interpersonal Competency Needs of Technical Teachers

Interpersonal competency, also known as social competency, refers to the ability to interact positively and get along well with others. According to Riggio and Lee (2007), social competency is defined as a set of positive social skills necessary to get along well with others and function constructively in groups. According to the authors, social competency includes:- respecting and expressing appreciation for others; being able to work and communicate well with others and listen to others' ideas; demonstrating

appropriate behavior that is consistent with social norms and using a range of skills or processes aimed at resolving conflict. Singh and Manser (2008) defined *interpersonal competency* as the capacity in one's work and play with others. This includes; to clarify, to formulate, to do what one wishes, to test for, to help others do the same, etc. Several implications are crowded into this short definition. First, the phrase "in one's work and play with others" suggests that interpersonal competency is an interactive social competency and not merely a kind of intellectual competency. Second, the phrase "to clarify, to formulate, and to do what one wishes" suggests that interpersonal competency is not merely skill in accomplishing predefined tasks but rather includes the practices of discovering what one wishes and defining (formulating) the tasks to be done.

According to Ekong (2013a), interpersonal competency refers to how we relate with others. That is, interpersonal competencies relate to the way someone communicates and interact with others. The author further explained that interpersonal competencies involve the sharing of our basic paradigms which has to do with our perception, understanding and interpretation of reality. However, interpersonal competencies include communication skills, cooperative learning and courtesy. They also include work habits such as organization, time management and persistence. According to Udoudo and Maigida (2013), examples of interpersonal or social competencies include the following:

1. empathy- ability to sense others feelings and perspectives and take an active interest in their concerns;
2. organisational awareness- ability to understand the power of relationships in one’s group or organization;
3. service orientation – ability to foresee, recognize and meet customers’ needs in his specific area of mechanical technology;

4. developing others- ability to sense others long term developmental needs and boost their abilities;
5. influence – ability to use effective tactics for persuasion;
6. communication – ability to send clear and convincing messages to the group in an open and effective way;
7. conflict management –ability to negotiate and resolve disagreements easily;
8. inspirational leadership – ability to inspire and guide individuals and groups;
9. change catalyst – ability to initiate and direct change in a group or organization;
10. building bonds – ability to take care of beneficial relationships; and
11. teamwork and collaboration- ability to work with others towards common goals and creating group synergy in pursuing collective goals.

Interpersonal competencies also include teachers mentoring skills. Ekong (2013b) defined mentoring as the process of "working along beside" a student with the aim of helping the student to achieve one's potential. Ekong emphasized that mentoring is a non-judgmental, one on one relationship that could be established between the teacher and the students. The researcher went on to define a mentor as an experienced, successful and knowledgeable, professional who willingly accepts the responsibility of facilitating professional growth and support of someone through a mutually beneficial relationship. Ekong identified the following as mentoring skills expected of teachers;

- skills of relating to the mentees (students);
- skills of motivating the mentees;
- skills of listening to the mentees;
- skills of assisting the mentees to develop plans and carrying them through;
- skills of being able to identify the mentees hidden talent and skills;
- skills of being able to communicate hope and optimism;

- skills of being able to be committed to the mentor programme;
- skills of making the time table for the mentorship programme available;
- skills of setting and maintaining from boundaries;
- skills of delegating responsibilities to mentees;
- skills of helping mentees to become more connected to the college; and
- skills of maintaining confidentiality and trust within appropriate limits.

The Need for Enhancing Technical Teachers' Professional Competencies

There exist numerous reasons technical teachers competency needs should be enhanced. Cannon, Kitchel, Duncan and Arnett (2011) noted that many Career and Technical Education (CTE) teachers entered the profession through a variety of traditional and alternative certification routes. Technical teachers who enter the profession through alternative certification routes are more likely to feel well-prepared in terms of content, but feel less well-prepared in pedagogy than those who have completed traditional certification programmes (Ruhland & Bremer, 2002). This combination of forces raises the importance of enhancing technical teachers competency needs as a strategy for ensuring a high level of competency in Career and Technical Education (CTE) teachers.

Also, the North Carolina State Board of Education (2012) presented several reasons by which teachers' competency needs should be enhanced. According to this source, the different demands on 21st century education dictate new roles for teachers in their classrooms and schools. It added that the following define what teachers need to know and do to teach students effectively in the 21st century:

- leadership among the staff and with the administration is shared in order to bring consensus and shared ownership of the vision and purpose of the work of the

school. Teachers are valued for the contributions they make to their classroom and the school;

- teachers make the content they teach engaging, relevant, and meaningful to students' lives;
- teachers can no longer cover material; they, along with their students, uncover solutions. They teach existing core content that is revised to include skills like critical thinking, problem solving and information and communications technology (ICT) literacy;
- in their classrooms, teachers facilitate instruction encouraging all students to use 21st century skills so they can discover how to learn, innovate, collaborate and communicate their ideas;
- the 21st century content (global awareness, civic literacy, financial literacy and health awareness) is included in the core content areas;
- subjects and related projects are integrated among disciplines and they involve relationships with the home and community;
- teachers are reflective about their practice and these include assessments that are authentic and structured and demonstrate student understanding; and
- teachers demonstrate the value of lifelong learning and encourage their students to learn and grow.

The need for enhancing the competency needs of technical teachers is acknowledged by Owolabi (2006) who pointed out that given the rapid accumulation of scientific and technological facts and the high rate of change of the existing facts, it is apparent that no matter the efficiency of the pre-service training given to teachers, it is pertinent for teachers to be retrained from time to time. The Federal Government of Nigeria also acknowledged the need for enhancing teachers' competencies when it

stipulates that teacher education shall continue to take cognizance of changes in methodology and the curriculum and that teachers shall be regularly exposed to innovations in the profession (FRN, 2013).

Similarly, Schleicher (2012) noted that as teachers around the world are undertaking wide-ranging reforms to better prepare children for the higher educational demands of life and work in the 21st century, the skills that young people demand in this rapidly changing world and the competencies technical teachers need to effectively teach these skills well in a 21st century classroom are equally changing. Schleicher pointed out, for instance, that today, where students can access unlimited content on search engines and where routine cognitive skills are being digitized or outsourced, these have serious implications for teacher preparation and continuing competency enhancement.

Moreover, Akpan and Silas (2013) presented some reasons for which Basic Technology teachers retraining should be imperative. First, new entrants into the teaching profession are largely coming from the ranks of less qualified graduates most of whom did not study education as one of their courses. Secondly, the teacher recruitment process is plagued with lack of transparency and extensive application of non-professional criteria, including political patronage. Thirdly, once in, there is no way for the authorities to get rid of even notoriously poor performers. Lastly, teachers are not seriously evaluated and they advance only by seniority. According to Owolabi (2012), this invariably resulted in a situation where Nigerian secondary schools are filled with anybody who is willing to teach such that there are non-professional teachers who have adequate subject content knowledge but lack pedagogical skills and there are professional teachers who are obsolete in knowledge in the light of recent innovation and developments in the technological and educational systems.

Furthermore, Schleicher (2012) noted that globalisation and developments in information and communication technology are causing profound changes in the world of work. Schleicher noted that these changes have profound implications for the teachers and the entire education system. Schleicher went on to state that there is a compelling demand on the education system to adequately equip all students with the knowledge, skills and dispositions for success in an increasingly globalized and digital world. Hence, there is a timely need to re-examine important matters relating to the changing world of work, such as educational and training institutions, learning processes and necessary teachers' competencies, amongst many others.

Moreover, the Asia Society (2012) encapsulated the need for retraining of TVET teachers to deliver 21st century skills thus:

> We are trying to teach twenty-first century skills with twentieth-century teachers in nineteenth-century learning environments. ...Teacher preparation programmes should prepare teachers with the values, skills, and knowledge not just to keep abreast with the times but also be ahead of their time (p. 6).

The need for enhancing competency needs of Basic Technology teachers in Nigeria is further accentuated by Akpan and Silas (2013) who noted that Basic Technology is taught as an integrated subject with one teacher teaching all the components. Akpan and Silas argued that since the teachers were not prepared in all these areas, they may not be able to teach the subject effectively because of their narrow preparation. Similarly, Ogbuanya (2005) noted that Basic Technology being an amalgamation of a number of distinctive technical trade areas should not be taught by teachers most of whom are generally trained in only one or two of these trade areas. This position is shared by Atsumbe, Raymond and Mele (2012) who reported that majority of the teachers employed to teach the subject in Kogi state cannot handle all the components effectively. Udoudo, Udoetuk and Ekon (2012) expressed fear that this problem might become aggravated with

the inclusion of new topics in Information and Communication Technology (ICT) in the new Basic Education curriculum as these topics may tend to be difficult for some of the teachers to handle effectively. In view of the foregoing, the need for enhancing competency needs of Basic Technology teachers in Cross River State becomes imperative.

Empirical Studies

Empirical studies related to this study are reviewed in this section under relevant subheadings as follows:

Pedagogical competency needs of technical teachers for effective teaching of Basic Technology

Kumazhege and Zira (2010) conducted a study on assessment of technical competency needs of Introductory Technology teachers in junior secondary schools in Adamawa State. The study adopted the descriptive survey research design and the population consisted of 201 Introductory Technology teachers in 174 government secondary schools within Adamawa State. A sample of 60 teachers obtained using stratified random sampling technique was used for the study. A structured questionnaire entitled "Teachers competency questionnaire was used for data collection. Five experts from Technology Education Department, University of Yola validated the instrument. The split half technique was adopted to find the reliability of the instrument. The reliability coefficient of the entire instrument was 0.66. Three research questions guided the study. The data analysis revealed that : Introductory Technology teachers in Adamawa State have deficiencies in various aspects of Introductory Technology, most of the Introductory Technology teachers in Adamawa State have acquired technical skills in one or two aspect of Introductory Technology, all the Introductory Technology teachers in Adamawa State agreed that they need refresher courses and in-service retraining to be properly grounded

in other areas so as to have a broad-based training in all aspects of Introductory Technology.

It was recommended that the Adamawa State Ministry of Education in collaboration with Post Primary Schools Management Board should organize workshops and training for Introductory Technology teachers in the state to make up for the other areas of Introductory Technology in which they are deficient. Introductory Technology teachers in Adamawa State junior secondary school should be encouraged to go for further training through in-service in the universities of technology where they can acquire both theoretical and practical skills needed to teach all the areas of Introductory Technology.

The work of Kumazhege and Zira is related to the present study in that both adopted descriptive research design and both delved into competency needs of Basic Technology teachers. Both studies differ in area of the study, research question and population.

Onu and Mohammed (2014) conducted a study on competency improvement needs of farmers in soil prevention and control for enhancing crop production in Kogi State. The purpose of the study was to identify competency improvement needs of farmers in soil erosion prevention and control for enhancing crop production in Kogi State. The study adopted descriptive survey research design and was guided by two research questions. The population of the study comprises 1044, made up of 834 crop farmers and 210 Agricultural Extension Agents registered with the State Ministry of Agriculture in Kogi State. The sample for the study was 628, made up of 418 crop farmers and 210 Agricultural Extension Agents. An 82 item questionnaire was developed from literature reviewed and used for data collection. The instrument was face validated by 3 experts from the department of Vocational Teacher Education, University of Nigeria, Nsukka. Cronbach Alpha method was used to determine the internal consistency of the instrument

and a coefficient of 0.89 was obtained. The study found out that farmers needed improvement on 37 cultural practices as follows: 10 competencies in mulching, 12 in cover cropping, 8 in strip cropping, 7 in contour farming among others. The study recommended the organization of rural based programmes for the training of farmers in the practice indentified to enhance their competencies in soil erosion prevention and control for increased crop production.

Their study is related to the present study in design and both looked at competency need of technical teachers. Conversely, both studies differ in that the current study looked at technical teachers competency needs whereas Onu and Muhammed's work focused on competency needs of farmers and agricultural extension agents.

Vandi, Wampana and Shanga (2017) conducted a study on assessment of technical skills competency needs of electrical installation and maintenance work trade teachers in skills competency needs of electricl installation and maintenance work trade teachers in skills acquisition centres of Yobe State. The study adopted descriptive survey research design. Three research questions and three hypotheses guided the study. Cronbach's alpha was used to determine the reliability of the instrument. A reliability coefficient of 0.63 was obtained. The population of the study consisted of 28 electrical installation trade technical teachers. There was no sampling as the entire population was used for the study. The instrument for data collection was titled "Technical competency needs of electrical installation and maintenance work teachers in skills acquisition centres". Mean and standard deviation were used to analyse the data. The hypotheses were tested using the t-test statistic. The study found that majority of the respondents believed that they needed technical competency retraining in all trade module of electrical installation and maintenance work. The study concluded that the electrical installation and maintenance work trade teachers teaching in the skills acquisition centres

in Yobe state needed technical competency improvement in all the items listed in domestic electrical installation. The study recommended that teachers in the trade centres should go for retraining in order to impart employable skills to the trainees and at the same time government should organize regular workshops/seminars to teachers in the trade area.

The present study is related to Vandi, Wampana and Shanga's study in research design and both looked at competency needs. Both studies differ in area and population of the study.

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 adopted survey research design. The population for the study was 24 instructors. 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 instrument was validated by 3 experts in the department of Vocational Teacher Education, University of Nigeria, Nsukka. The split half and Cronbach alpha method were used to determine the reliability which yielded a coefficient of 0.86. Weighted Mean and Improvement Required Index (IRI) were used to answer the research questions. It was found out in 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 trained in the 25 competencies identified by this study through workshops and short duration courses by the stakeholders.

The present study is related to Olaitan's et al study in the area of design and competency needs of teachers. Both differs in that that the present study focused on Basic Technology Teachers while the former study focused on agricultural science instructors.

Classroom management competency needs of technical teachers for effective teaching of Basic Technology

Okwori, Owodunni and Abiodun (2015) conducted a study on classroom management styles and students' performance in Basic Technology: A study of junior secondary schools in Barign metropolis, Lagos State, Nigeria. Two research questions guided the study. The survey research design was adopted for the study. To determine the reliability of the instrument, Cronbach's alpha was used. The reliability coefficient of the entire instrument was 0.78. The population of the study was 1350 respondents. A sample size of 253 respondents obtained using simple random sampling technique was used for the study. Structured questionnaires deviations were used for the study. Mean and standard were used in analyzing the data. The study found that the classroom management style adopted by Basic Technology teachers include reminding students of the classroom rules and regulations when teaching the subject and at the same time it was found that basic technology. Teachers always involved students in classroom activities. It was concluded among others that teachers must study both students and the environment to know the appropriate classroom management style to use. It was recommended that Basic Technology teachers should put to use the effective classroom management style that best suit the classroom environment and the students. The present study is similar to Okwori's et al study in terms of design and both focused on Basic Technology and it's classroom management. The two studies are different in that the present study looked at classroom management competency needs, while the study of

Okwori et al focused on classroom management styles and students' performance in Basic Technology.

Aremu (2015) conducted a study on competency improvement needs of Technology teachers in the implementation of Basic Technology in Kogi State. The purpose of the study was to determine the 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. The instruments used for data collection was structured questionnaire entitled 'Competency Needs of Teachers Questionnaire". The instrument was face validated by 3 experts in the department of Vocational Teacher Education, University of Nigeria, Nsukka. The internal consistency of the instrument was determine using Cronbach Alpha coefficient method. A reliability coefficient of 0.82 and 0.77 were obtained for the two sets of the instrument. The study found among others that teachers of Basic Technology needed improvement in applying varieties of teaching methods and techniques for the implementation of Basic Technology. It was recommended that workshops and seminars should be organised for the teachers of Basic Technology in order to build their capacity for the implementation of the Basic Technology in junior secondary schools in Kogi State. It was recommended that teachers of Basic Technology should be retrained based on areas of needs identified in the study.

Aremu's study is related to the present study in design and both focused on classroom competency needs of technical teachers for effective teaching of Basic Technology. On the other hand, both studies differ in area of the study, research questions and population.

Austin and Omomia (2014) carried out a study on perceived impact of classroom management on effective teaching in Lagos State, Nigeria. Three research questions guided the study. The descriptive survey research design was adopted for the study. Cronbach's alpha was used to determine the reliability of the instrument and a reliability coefficient of 0.70, 0.65 and 0.64 were obtained. The population of the study comprised all teachers in secondary schools in Education District II, Lagos State. A sample size of 50 teachers was used. A structured instrument entitled "perceived impact of classroom management questionnaire was used for data collection. Mean, frequency counts and percentages were used to analyze the data. The study found that most teachers were not competent in classroom management and were not exposed to ways of improving classroom management skills. The study concluded that effective classroom management would likely influence the academic performance of the students and guarantee the right students' outcomes desired by the school. It was recommended that teachers should be exposed to different skills on classroom management and at the same time right school climate should be provided for teachers to effect the right classroom management practices without inhibition. The study of Austin and Omomia is related to the present study in that both focused on classroom management competency needs. Both studies also related to each other in research design and they studies differ in area and population of the study.

Information and communication technology competency needs of technical teachers for effective teaching of Basic Technology

Eze and Okoroafor (2013) conducted a study on pedagogical information and communication technology (ICT) competencies needed by tertiary technical teachers in south east Nigeria. The study adopted a survey research design and the population of the

study consisted of 145 technical teachers. Two research questions and four null hypothesis guided the study. The reliability of the instrument was established using Cronbach alpha and it had a reliability coefficient of 0.73. The population of the study consisted of 145 technical teachers. There was no sampling as the researchers were able to study the whole population. The instrument for data collection was a structured questionnaire. Arithmetic mean was used in analyzing the data. Analysis of variance and z-test statistic were used to test the null hypotheses at 0.05 level of significance. It was found that the tertiary technical teachers (TTT) needed teaching based ICT competencies, computer operation competencies among others. It was concluded the TTT were aware of the changes spurred by ICT in the technical education curriculum and as such were in need of ICT competencies. It was recommended among others that ICT should be a compulsory course in all technical teachers preparatory programmes. The study of Eze and Okaroafor's study is similar to the present, study in design and both focused on technical teachers competencies needs. Both studies differ in that Eze and Okoroafor focused on tertiary technical teachers (TTT), but the present study focused on secondary technical teachers.

Mustapha, Idris, Kutiriko and Ewugi (2016) conducted a study on competencies needed by automobile technology teachers towards the development of ICT for teaching learning purposes. Six research questions and three hypotheses guided the study. The study adopted the descriptive survey research design. Cronbach's alpha was used to determine the reliability of the instrument and a reliability coefficient of 0.74 was obtained. The population of the study consisted of 24 technical college teachers. There was no sampling as the entire population was used for the study. Fifty-three structured questionnaire items were used as instrument to collect data. Data obtained were analysed using mean, analysis of variance (ANOVA) and scheffe's test. The study found that fifty-

three ICT competencies were needed by the automobile technology teachers. The study concluded that the retraining of automobile technology teachers is necessary for the attainment of emerging information and communication technology competencies. The study recommended that there should be regular training for automobile teachers and at the same time, the curriculum of technical colleges should be reviewed on regular basis.

Ede and Ariyo (2015) conducted a study on competency improvement needs of metalwork teachers in the use of Computer Numerically Controlled machine tools in technical colleges in Oyo State. The study adopted survey research design and the population comprise 35 metalwork teachers in technical colleges in Oyo State. Two research questions guided the study. A 44 competency item questionnaire entitled 'Competency Improvement Needs of Metalwork Teachers in the use of Computer Numerical Controlled Machine Tool Questionnaire was used for the study. The instrument was validated by 3 experts from the department of Vocational Teacher Education, University of Nigeria, Nsukka. Cronbach's alpha was used to determine the reliability coefficient of the instrument which yielded a value of 0.86. Weighted Mean and Improvement Needed Index (INI) were used to analyse the research questions. Based on the findings of the study, it was found among others that metalwork teachers are deficient in some technical skills in the use of computer numerical control lathe and milling machines. It was recommended that: the federal and state ministry of education should through, the science and technical schools management board, set in motion a process for providing in-service training to metalwork teachers who lack required skills in using computer numerically controlled machine tools, government and employers of metalwork graduates should donate modern machines and tools to technical colleges in Oyo State among others.

Ede and Ariyo's study is related to the present study in research design and both looked at competency need of technical teachers.

Intrapersonal competency needs of technical teachers for effective teaching of Basic Technology

Alio (2006) carried out a study on strategies for enhancing the competencies of electronics craftsmen in the informal sector of the economy of Enugu State. Eight research questions and five hypotheses guided the study. The survey research design was adopted for the study. Cronbach's alpha was used to determine the reliability of the instrument. The instrument yielded a reliability coefficient of 0.98. The population of the study consisted of 850 craftsmen. A sample size of 346 craftsmen was used for the study. A 118 item structured questionnaire was used for the study. Mean, standard deviation, frequency counts and percentages were used to answer the research questions. The hypotheses were tested using analysis of variance (ANOVA) and t-test statistic. The study identified some strategies for enhancing the theoretical, technical and management competencies of electronics craftsmen in the informal sector. It was concluded that electronics craftsmen are deficient in some theoretical competency like good oral communication, knowledge of grammar among others. It was recommended that intervention measures identified in this study to improve and update the electronics craftsmen's competencies should urgently be embarked on. The study of Alio is similar to the current study in design and at the same time both studies looked at intrapersonal competency needs. Box studies differ in research question, area of the study and population. The present study made reference to Basic Technology teachers while the former study made use of electronics craftsmen in the informal sector.

Robles (2012) conducted a study on executive perceptions of the top 10 soft skills needed in today's work force. Two research questions guided the study. The survey

research design was adopted for the study. The population of the study consisted of 135 students and business executives. There was no sampling and a structured questionnaire was used to obtain data. Mean, standard deviation, frequency counts and percentages were used to analyse the data. The study found executives overwhelming indicating that integrity and communication were the top two soft skills needed by employees in today's workplace. The study concluded that soft skills are as good an indicator of job performance as traditional job qualifications. It was recommended that soft skills are crucial in today's workplace and should be viewed as an investment. Also, soft skills and hard skills should be integrated to create a well rounded business graduate. Both studies are related to each other in research design and also they looked at intrapersonal competency needs. Both studies differ in terms of research questions, purpose, area and population of the study.

Interpersonal competency needs of technical teachers for effective teaching of Basic Technology

Usoro and Anah (2012) carried out a study on work skill needs of building technicians for enhancing fundamental principles of building practices in Akwa Ibom State. The purpose of the study was to determine work skill needs of building technicians for enhancing fundamental principles of building practices. Three research questions guided the study. The survey research design was adopted for the study. The population for the study was all the 37 building/woodwork technical teachers and 20 technologist in building and woodwork. A 61 item questionnaire was developed from the literature and used for data collection. The instrument was face validated by 3 experts from the department of Vocational Education, University of Uyo, Uyo. A reliability coefficient of 0.87 was obtained using Cronbach Alpha method. It was found out that building technicians require retraining in technical, interpersonal and psychological work skills. It

was recommended that the work skills indentified in this study be used to retrain building technicians through workshops and seminars. It was also recommended that, affective domain is taught as a subject in Vocational Technology Education and Building Technician should exhibit soft skills in order to keep a job and progress in it.

Usoro and Anah is related to the current study in research design and both delved into interpersonal competency needs. Both differs in area and population of the study.

Lindsey and Rice (2015) conducted a study on interpersonal skills and education in the traditional and online classroom environments. Two research questions guided the study. The study adopted descriptive research design. Cronbach's alpha was used to determine internal consistency of the instrument. A reliability coefficient of 0.686 was obtained. The sample size of the study was 865 students. A 20-item situational test of emotional management questionnaire was used for the study. Mean and standard deviation were used to analyse the data. Analysis of variance (Anova) was used to test the hypotheses. The study found that the respondents might benefit from training and practice of interpersonal skills in an online environment. It was concluded that interpersonal skills are perceived to be inferior in the online atmosphere when compared with the face to face environment. The study recommended that pedagogical practices should be associated with interpersonal skills and that education could be improved upon to help individuals cultivate relationships, cope better at work and in social situations based on the result of this study by combing learning opportunities.

The work of Lindsey and Rice is related to the present study in research design and both studies delved into interpersonal competency needs. Both differ in area and population of the study.

Laboratory/workshop management competency needs of technical teachers for effective teaching of Basic Technology

Saucier and Mckim (2011) carried out a study on assessing the learning needs of student teachers in texas regarding management of the agricultural mechanics laboratory: implications for the professional development of early career teachers in agiruclture education. Two research questions guided the study. The descriptive survey research design was adopted for the study. Cronbach's alpha was used to determine the reliability of the instrument and a reliability coefficients of 0.98 and 0.99 were obtained. The population of the study was 98 student teachers. There was no sampling since the entire population was used. A structured questionnaires were used in data collection. Mean and standard deviation were used to analyse the data. The study found that student teachers were in need of professional development in many areas of laboratory management such as diagnosing malfunction laboratory equipments, repairing laboratory equipment, repairing laboratory equipment and administering first aid. In conclusion, the study has provided an initial mechanics laboratory management for persevice teachers. It was recommended that agiruclture mechanics coursework be integrated into teacher preparation in agricultural education progrmmes and focus on areas related to laboratory and equipment maintenance and laboratory safety. Saucier and Mckim's study has similarities with the current study in terms research design and both delved into laboratory competency needs. The present study made use of the technical teachers, while the other study made use of the student teachers. Both studies also differ in terms of area of the study and population.

Schlautman and Silleto (2001) carried out a study on analysis of laboratory management competencies in Nebraska agricultural education programmes. Two research questions and hypotheses guided the study. Cronbach's alpha was used to find the reliability of the instrument and the instrument had a reliability coefficient of 0.98.

The population of the study was 128 secondary agricultural education instructors. A sample of 40 respondents was obtained. The study adopted survey research design.

A structured questionnaire was used in collecting data. Mean and standard deviation were used to answer the research questions and the t-test statistic was used to test the null hypotheses. The study found that secondary Nebraska agricultural educators possessed above average competencies in laboratory management and at the same time, some laboratory management competencies were not needed. It was concluded that effective scheduling and management of the agricultural mechanics laboratory is a must for carrying out an effective instructional programmes. It was recommended that in-service courses be conducted for current secondary educators to enhance their laboratory competencies. Also, undergraduate laboratory course should continue to stress the needed areas of laboratory management competencies. The work of Schlautman and Silleto is related to the present study in research design and both looked at laboratory management competencies. Both studies differ in area of the study, number of research questions and population of the study.

Dangasa (2006) conducted a study on the technical skills improvement needs of auto-electronic technicians in the maintenance of modern day automobiles in Niger state. The study was carried out in Niger state of Nigeria and the population consisted of 780 automobile electronics technicians operating in Niger State. The sample was made up of 160 respondents. The survey research design was adopted for the study. Two research questions and one hypothesis guided the study. The instrument for data collection was a structured questionnaire containing 60 items structured on the five point likert scale. The data collected was analysed with frequency counts, percentages, mean, standard deviation and analysis of variance. The Cronbach Alpha was used to determine the reliability of the instrument. The entire data yielded a reliability coefficient of 0.72.

It was found that the automobile electronics technicians in Niger State possessed a medium level of skills in most of the areas investigated which were not adequate for their efficient maintenance of modern day automobiles in Niger state. Some of the most important areas where technical skills improvement were needed were in performing on-board computer diagnosis on electronic control units (ECU) or "brain boxes" using scanning equipment such as onboard diagnostic (OBD) scanners and code readers; diagnosing and repairing electronic fuel injection system, faults and repairing or replacing electronic ignition components such as multiplex signals and current flow controls as well as in conducting engine performance test using engine analysers. It was also found that the automobile technicians need to improve their skills in diagnosing and repairing faults in anti-lock braking system, Electronic Stability Programme (ESP) and traction control system, cruise control system and reactivation of deployed air bags. The researcher recommended among others that a retraining programme should be organised for the automobile electronics technicians in Niger State in all the identified areas of need to enable them improve and update their technical skills in the maintenance of modern day automobiles in Niger state.

Both studies are related to each other in the design and both looked at skill improvement needs. Both differ in area of study, population and research questions. The present study focused on Basic Technology Teachers whereas the former study focused on auto-electronic technicians.

Affective work competency needs of technical teachers for effective teaching of Basic Technology

Atsumbe, Raymond, Idris and Mele (2012) conducted study on retraining needs of technical educators for implementation of the junior secondary school Basic Technology programme in Kogi State. The purpose of the study was to determine the

retraining needs of Basic Technology teachers for the implementation of the junior secondary school Basic Technology programme in Kogi State. Three research questions guided the study. The survey research design was adopted for the study. The population for the study was 216 respondents, made up of 161 teachers of Basic Technology and 55 head teachers of various vocational education courses. A structured questionnaire having 80 items was used for the study. Three experts from the department of industrial and technology education, federal university of technology Minna, Niger State validated the instrument. Cronbach's alpha was used to established a reliability coefficient of 0.89. The data analysis revealed that Basic Technology teachers need training and retraining in pedagogical skills and their background in various practical skills areas of Basic Technology are rickety and defective. Further analysis revealed that these teachers hardly manifest any affective work skills. Based on the findings, the following recommendations were made: immediate retraining for the current teachers of Basic Technology with emphasis in the areas of pedagogical and technical skills, modification of the current Nigeria certificate in education (NCE) curriculum for training technical teachers and universities offering vocational education programmes should be used for the retraining during long vacation.

The work of Atsimbe et al (2012) relates to the current study in that both adopted survey research design and focused on affective work competency needs of technical teachers.

Conversely, Atsumbe's et al study covered technical teachers and head teachers whereas the present study covered only technical, teachers teaching Basic Technology.

Atsumbe and Saba (2008) carried out a study on Affective work skills need of engineering and technology education students of Universities in North Central States of Nigeria. One research question and one hypothesis guided the study. The study adopted

a survey research design. Cronbach's alpha was used to determine the reliability of the instrument and a reliability coefficient of 0.72 was obtained. The population comprised 60 engineers, 100 technicians and 150 lecturers, obtained using purposive sampling technique. A structured 18 – item questionnaire was used to collect data. Mean, standard deviation and one-way analysis of variance (ANCOWA) were used to analyse the data. The study found that the respondents were deficient in the following skills namely observing safety precautions, development of self confidence, emotional stability and development of positive work habit. It was recommended that affective work skill, industrial safety and occupational health education be incorporated into the existing curriculum of engineering and technology base programmes. The study of Atsumbe and Saba is related to the present study in the design and both studies looked at affective work competency needs. Both studies differ in that the present study focused on technical teachers while the former study focused on engineering and technology education students.

Akpan and Silas (2011) conducted a study on professional development needs of Basic Technology teachers in Akwa Ibom State. Two research questions and two hypotheses guided the study. The study adopted survey research design. Test retest method was used to determine the reliability of the instrument. The instrument yielded a reliability coefficient of 0.75. The population of the study comprised 92 teachers of Basic Technology and principals. A sample of 74 respondents was used for the study. An instrument entitled "Professional Development Needs Assessment of Basic Technology Teachers Questionnaire" was used for the study. Mean, standard deviation and t-test statistic were used to analyse the data. The study found that high training was needed in pedagogical, affective, instructional materials development and utilisation competencies among others. It was also found that the teachers of Basic Technology were deficient in

lots of competencies. Based on the findings, it was concluded that Basic Technology teachers in Akwa Ibom State are not very competent in all areas of pedagogy as well as instructional materials development and utilisation. It was recommended that the federal and state government should organize regular retraining programmes for teachers in the state based on the areas of deficiency as identified in the study. The present study is related to the study of Akpan and Silas in terms of design and at the same time, both studies focused on affective work competency needs. Conversely, both studies differ in area and population of the study.

Instructional materials development and utilsiation competency needs of technical teachers for effective teaching of Basic Technology

Olaunde, Fakomogbon, Olabisi and Adetunde (2017) conducted a study on assessment of instructional resources for Teaching Basic technology in junior secondary schools in Ogbomoso, Nigeria. Two research questions guided the study. The survey research design was adopted for the study: Crobach's alpha was used to determine the reliability of the instrument and a reliability coefficient of 0.69 was obtained. The research sample consisted of all 75 teachers in junior secondary schools in Ogbomoso. The instrument for data collection was entitled "availability and utilisation of instructional resource in Teaching Basic Technology". Frequency counts and percentages were used as statistical tools. The study found that available instructional resources were not functional and that teachers of Basic Technology in Ogbomoso were deficient in instructional resources and utilisation competencies.

In conclusion, the study showed that instructional resources were available for teaching Basic Technology in junior secondary school in Ogbomoso. It was recommended that seminars, workshops and in-service training should be organized for teachers in order to assist them to acquire necessary skills on how to effectively use

available instructional resources. This study is related to the present study in research design and both studies delved into instructional materials utilization competency needs. Conversely, both studies differ in study area and population.

Ogbu (2016) conducted a study on availability and utilisation of instructional facilities for teaching of Basic Electricity in Ebonyi State Technical Colleges. Two research questions and one hypothesis guided the study. The survey research design was adopted for the study. Cronbach's alpha was used to determine the reliability of the instrument and the reliability coefficient was 0.86. The population of the study was 150 Basic Electricity technical teachers and students. There was no sampling as the entire population was used for the study. Instrument for data collection was a structured questionnaire. Mean, frequency counts and percentages were used to answer the research questions. The t-test statistic was used to test the hypothesis. The findings showed that the technical teachers are deficient in the instructional materials utilization competencies and at the some time, the instructional materials were not adequate. It was recommended that all stake-holders should contribute financially and materially with a view to enhancing teachers skills acquisition in instructional materials utilisation. This study is similar to the current study in terms of design and both looked at the utilisation of instructional materials. The present study is on the teaching of Basic Technology while the previous study is on the teaching of Basic Electricity. Both studies also differ in terms of area and population

Umunadi (2009) conducted a research on teacher utilisation of instructional equipment and materials in teaching Basic Electricity in urban and rural technical colleges. Two research questions and one hypothesis guided the study. The survey research design was adopted for the study. Cronbach's alpha was used to determine the reliability of the instrument and a reliability coefficient of 0.76 was obtained. The

population of the study was 276 technical students and a sample of 200 respondents was used. A structured questionnaire was used for the study. Percentage, mean and standard deviation were used to analyze research questions and the z-test statistic was used to test the hypothesis. The findings showed that there is adequacy of Basic Electricity materials and equipment. Also, the teachers were deficient in the competencies as regards the utilisation of instructional materials and equipment.

Umunadi's study is related to the present study in terms of design and both studies delved into utilsiation of instructional materials. The present study focused on Basic Technology while the former study dealt with Basic Electricity. Both studies also differ in area and population of the study.

Summary of Review of Related Literature

The review of related literature to this study was done under four major sub headings namely conceptual framework, theoretical framework, theoretical studies and related empirical studies. The concepts of technical teacher education, competency, needs and needs assessment as well as the concept of Basic Technology constituted the conceptual framework of the study. Two theories namely Social Learning Theory by Albert Bandura and Kaufman's Mega Planning Theory of Needs Assessment constituted the theoretical framework of the study. These theories were found to be very relevant to this study as they espoused the process of social and cognitive learning as well as needs assessment which are very relevant to this study. The review of literature revealed that globalisation and the revolution in information and communication technology have enormous implications on technical teacher education and the competencies teachers need to teach effectively in the 21st century classroom. It was further found from the review of related literature that possession of adequate competencies by technical teachers is very indispensable for effective performance of their duties as this would lead to better

students' achievement which in turn would contribute to Nigeria's technological and economic development.

Moreover, twenty four related empirical studies were also reviewed. From all the reviewed related empirical studies, none known to the researcher was carried out on technical teachers' competency needs for teaching Basic Technology in junior secondary schools in Cross River Sate. The present study therefore intends to bridge this gap by determining the technical teachers' competency needs for effective teaching of Basic Technology in junior secondary schools in Cross River State.

CHAPTER THREE

METHOD

This chapter presents the method adopted fur the study under research design, area of the study, population of the study, sample and sampling technique, instrument for data collection, validation of the instrument, reliability of the instrument, method of data collection and method of data analysis.

Research Design

Descriptive survey research design was adopted for the study. Nworgu (2006) defined survey research design as one in which a group of people or items are studied by collecting and analysing data from only a few people or items considered to be representative of the entire group or by collecting and analysing data from the entire people or items using questionnaire or interview. This design is suitable for this study as the researcher used a questionnaire to collect data from a sample of technical teachers who are teaching Basic Technology in secondary schools in Cross River State.

Area of the Study

The study was carried out in Cross River State. The state has 18 Local Government Areas in three zones. It is located within the tropics, shares common boundaries with the Republic of Cameroon to the east, Benue State to the north, Abia and Ebonyi States to the west and Akwa Ibom State and the Atlantic Ocean to the south. The total population of the state was 3,866,269 as at 2016(National Population Commission). The choice of Cross River State was informed by the fact that the researcher is domicile in the area.

Population of the Study

The population of the study comprised all the 82 (63 males and 19 females) technical teachers who are teaching Basic Technology in 246 public secondary schools in Cross River State. The population distribution by zones and gender is shown in Appendix A on page 155.

Sample and Sampling Technique

There was no sampling as the entire population was used for the study due to the fact that the size was not too large.

Instrument for Data Collection

The instrument for data collection was a structured questionnaire entitled "Technical Teachers Competency Needs for effective Teaching of Basic Technology Questionnaire (TTCNETBTQ)". The items in the questionnaire were organized in accordance with the research questions developed to guide the study. The questionnaire for the study consisted of two parts, 1 and II. Part I solicited information on the gender of the respondent and part II was split into eight sub-sections A-H.

Section A was structured to seek information on the pedagogical competency needs of technical teachers for effective teaching of Basic Technology. It contains 12 items. Section B with 10 items was designed to elicit responses on the classroom management competency needs. Section C which has 12 items sought responses on the information and communication technology competency needs of Technical Teachers for effective teaching of Basic Technology in Cross River State. Section D which has 10 items was designed to elicit information on intrapersonal competency needs of technical teachers teaching Basic Technology. Section E with 12 items was structured to obtain responses from the interpersonal competency needs of Technical Teachers. Also, Section F which has 12 items was structured to obtain responses on the laboratory management competency needs of technical teachers. Section G with 12 items was structured to obtain information on affective work competency needs of technical teachers while Section H which has 10 items was to elicit responses from technical teachers on the instructional materials development and utilization competency needs for effective teaching of Basic Technology.

Basically, the questionnaire has two types of response scales or categories namely the needed and performance scales. The needed category is based on 5 point scale with nominal values assigned as follows:

Very Highly Needed	(VHN)	=	5 points
Highly Needed	(HN)	=	4 points
Moderately Needed	(MN)	=	3 points
Slightly Needed	(SN)	=	2 points
Not Needed	(NN)	=	1 point

The performance category equally has 5 point Likert scale with nominal values assigned as follows:

Very High Performance (VHP)	=	5 points
High Performance (HP)	=	4 points
Moderate Performance (MP)	=	3 points
Low Performance (LP)	=	2 points
Very Low Performance (VLP)	=	1 point

In all, the instrument consisted of 90 items.

Validation of the Instrument

The instrument for the study was subjected to face validation by three experts in technical education and measurement and evaluation. One of the experts was from the Department of Technology and Vocational Education, Nnamdi Azikiwe University, Awka, and others from the Department of Vocational Education and the Department of Educational Foundations, Guidance and Counseling Unit of University of Uyo, The

contributions of the experts were used in restructuring the instrument after clearing with the research supervisor.

Reliability of the Instrument

A pilot test involving 25 technical teachers who are teaching Basic Technology in 12 public secondary schools in Akwa Ibom State who were not part of the population of study was carried out. The data collected were analysed using Cronbach's alpha with SPSS-version 17. The Cronbach's alpha was used to establish the reliability of the instrument because it enhances a high degree of internal consistency. Reliability coefficients of 0.78, 0.71, 0.76, 0.72, 0.77, 0.77, 0.79, and 0.77 were obtained for the eight clusters with an overall reliability coefficient of 0.79 (see Appendix E). The instrument was adjudged reliable for the study as recommended by George and Mallery (2009) that a reliability coefficient of 0.70 and above indicates that the research instrument is reliable.

Method of Data Collection

The instrument for data collection was administered personally by hand to the technical teachers teaching Basic Technology in their schools with the help of six research assistants who were briefed on what to do. After delivering the instrument, the researcher or assistant agreed with the respondents on when to revisit for retrieval within one week. Phone calls and text messages were used for reminders to the respondents. This facilitated a high response rate as 78 copies (representing 95 percent) were retrieved and used for the study.

Method of Data Analysis

The Weighted Means of needed and performance were used to answer the research questions. The Improvement Need Index (INI) was used to identify the competencies needed by technical teachers for effective teaching of Basic Technology in Cross River

State. The z-test statistic was used to test the null hypotheses at 0.05 level of significance. Competencies needed by technical teachers were determined as follows:-

1. The Mean ($\overline{X}n$) of the needed category was determined for each item.

2. The Mean ($\overline{X}p$) of the performance category was determined for each item.

3. The Performance Gap (PG) was determined by finding the difference between the values of the two means. That is $\overline{X}n - \overline{X}p = PG$.

However, where PG is zero (0), it implies that the item is not needed because the level of performance of the competency by the technical teachers is equal to level at which the competency is needed. Where PG becomes negative (-), it means that the item is not needed because the level at which the technical teachers performance of the competency is higher than the level at which it is being needed. Where PG is positive (+),this implies that the competency for that item is needed because the level of performance of the competency by the technical teachers is lower than the level at which it is being needed.

Also, in testing the hypotheses, the hypotheses were not rejected when the calculated value of z (z-cal) was lower than the table value of z (z-critical). If otherwise, the null hypotheses were rejected. The Statistical Package of the Social Sciences (SPSS) was utilized in analyzing the data collected and for computing relevant statistics.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

The data collected in the study were statistically analysed and presented in this chapter. The presentation is done in tables and arranged in accordance with the research questions and hypotheses of the study.

Research Question 1: What are the pedagogical competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State?

Table 1: Performance Gap Analysis of the Mean Ratings of the Responses of the Respondent on the Pedagogical Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

n =78

S/n	Pedagogical Competencies	$\bar{X}n$	$\bar{X}p$	PG $\bar{X}n-\bar{X}p$	Remarks
1	Ability to state lesson objectives correctly in the three domains of learning	3.17	3.02	0.15	N
2	Ability to use a variety of instructional techniques to teach	3.05	2.99	0.06	N
3	Ability to develop appropriate instruments for assessing students performance in the three domains of learning	3.10	2.94	0.16	N
4	Ability to organise learning materials logically	3.10	3.01	0.09	N
5	Ability to connect lessons with students life experiences	3.23	3.11	0.12	N
6	Ability to conclude lessons appropriately	2.55	3.02	-0.47	NN
7	Ability to engage students in activities that encourage them to think critically and construct knowledge by themselves	3.02	2.94	0.08	N
8	Ability to select instructional materials correctly	2.73	3.03	-0.30	NN
9	Ability to set examination questions to cover various cognitive levels	3.74	3.25	0.49	N
10	Ability to arranging counselling programme based assessment results	3.31	3.03	0.28	N
11	Ability to use various methods in motivating students to learn	3.31	3.05	0.26	N
12	Ability to explain difficult/abstract concepts clearly	3.13	3.02	0.11	N
	Grand mean	3.13	3.06	0.07	N

*$\overline{X}n$ = Mean of Needed; $X\overline{p}$ = Mean of Performance; PG = Performance Gap; N = Needed; NN = Not Needed

The result on Table 1 shows the performance gap analysis of the responses on the pedagogical competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State. As depicted in Table 1, ten out of the twelve listed items have positive performance gaps while the other two items (items 6 and 8) have negative performance gaps. This implies that the 10 pedagogical competency items are needed by technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State while the other two items are not needed. Table 1 also shows that the grand mean for all the items has a performance gap value which is positive. This indicates that the technical teachers generally need all the

12 pedagogical competencies for effective teaching of Basic Technology in Secondary schools in Cross River State with less emphasis on the two items which have negative performance gap values.

Research Question 2: What are the classroom management competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State?

Table 2: Performance Gap Analysis of the Mean Ratings of the Responses of the Respondents on the Classroom Management Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

		n =78			
S/N	**Classroom Management Competencies**	$\bar{X}$**n**	$\bar{X}$**p**	**Gap** $\bar{X}$**n-**$\bar{X}$**p**	**Remarks**
13	Ability to use effective classroom management techniques	3.55	3.38	0.17	N
14	Ability to management class time well	3.20	3.05	0.15	N
15	Ability to manage large classroom	3.37	3.21	0.16	N
16	Ability to effectively manage handicapped students	3.22	3.05	0.17	N
17	Ability to identify and solve students problems	3.32	3.02	0.30	N
18	Ability to use various methods of managing stubborn/ problematic students	2.47	3.37	-0.55	NN

Table 2 Contd.
Performance Gap Analysis of the Mean Ratings of the Responses of the Respondents on the Classroom Management Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

		n =78			
S/N	**Classroom Management Competencies**	$\bar{X}$**n**	$\bar{X}$**p**	**Gap** $\bar{X}$**n-**$\bar{X}$**p**	**Remarks**
19	Ability to ensure that few students do not dominate class discussion	3.56	3.37	0.19	N

20	Ability to use various methods of managing exceptional students	2.30	3.60	-1.30	NN
21	Ability to maintain effective discipline in class	2.55	3.45	-0.90	NN
22	Ability to establish and enforce rules of behaviour in class	2.50	3.56	-1.06	NN
	Grand Mean	3.10	3.02	0.08	N

*$\overline{X}n$ = Mean of Needed; $X\overline{p}$ = Mean of Performance; PG = Performance Gap; N = Needed; NN = Not Needed

The result on Table 2 reveals that six out of the ten listed items have positive performance gaps values while the other four items (items 18, 20, 21 and 22) have negative performance gap values. This implies that technical teachers need the six classroom management competency items for effective teaching of Basic Technology in Secondary schools in Cross River State while the other four items are not needed. Table 2 also shows that the grand mean for all the items has a performance gap value of 0.08 which is positive. This indicates that the technical teachers generally need all the 10 classroom management competencies for effective teaching of Basic Technology in Secondary schools in Cross River State with less emphasis on the four items which have negative performance gap values.

Research Question 3: What are the Information and Communication Technology (ICT) competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State?

Table 3
Performance Gap Analysis of the of the Mean Ratings of the Responses of the Respondents on the Information and Communication Technology (ICT) Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

n =78

S/N	ICT Competencies	$\overline{X}n$	$\overline{X}p$	Gap $\overline{X}n$-$\overline{X}p$	Remarks
23	Ability to use word processing in preparation of lesson notes	3.19	3.05	0.14	N

24	Ability to use different search engines to source for educational materials	3.36	3.21	0.05	N
25	Ability to use internet to download videos/images for instructional use	4.12	3.98	0.14	N
26	Ability to design web pages	3.44	3.11	0.33	N
27	Ability to use of spreadsheet to prepare students examination result	3.54	3.05	0.49	N
28	Ability to use computer aided design (AUTOCAD) to teach technical drawing	4.02	3.96	0.06	N
29	Ability to use electronic mails (e-mail) for instructional purpose	3.51	3.22	0.29	**N**
30	Ability to use CD writers, flash drives and floppy discs for copying files	3.62	3.46	0.16	N
31	Ability to use powerpoint for instructional delivery	3.92	3.53	0.39	N
32	Ability to use video conferencing for instructional delivery	3.87	3.42	0.45	N
33	Ability to use technology tools to collect/analyse data	4.31	3.94	0.37	N
34	Ability to use cloud technology to enhance teaching and learning	3.79	3.44	0.35	N
	Grand Mean	3.73	3.36	0.37	N

*$\overline{X}n$ = Mean of Needed; $X\overline{p}$ = Mean of Performance; PG = Performance Gap; N = Needed; NN = Not Needed

The result on Table 3 shows the performance gap analysis of the responses on the ICT competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State. As depicted in Table 1, all the twelve listed items have positive performance gap values indicating that all the 12 ICT competency items are needed by technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State. Table 3 also shows that the grand mean for all the items has a performance gap value which is positive. This indicates that the technical teachers generally need all the 12 ICT competencies for effective teaching of Basic Technology in Secondary schools in Cross River State with less emphasis on the two items which have negative performance gap values.

Research Question 4: What are the intrapersonal competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State?

Table 4: Performance Gap Analysis of the Mean Ratings of the Responses of the Respondents on the Intrapersonal Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

n =78

S/N	Intrapersonal Competencies	$\bar{X}n$	$\bar{X}p$	Gap $\bar{X}n-\bar{X}p$	Remarks
35	Ability to understand my personal feelings/emotions accurately	3.70	3.52	0.18	N
36	Ability to recognize how my emotions affect my job performance as a Basic Technology teacher	3.73	3.54	0.19	N
37	Ability to know my strengths and limitations	2.51	3.42	-0.91	NN
38	Ability to have a strong sense of myself value and talents in my specific area of specialization	3.99	3.54	0.45	N
39	Ability to keep reckless feelings and worrying emotions under control when provoked	3.14	3.02	0.12	N
40	Ability to maintain a high degree of honesty and integrity in my place of work	2.55	3.56	-1.01	NN
41	Ability to be flexible in handling unexpected change	3.74	3.48	0.26	N
42	Ability to be persistent in pursuing goals despite obstacles and set backs	3.60	3.28	0.02	N
43	Ability to readily act on any available opportunities	3.47	3.29	0.18	N
44	Ability to always try hard to meet a standard of excellence in my job teacher	3.41	3.33	0.08	N
	Grand Mean	3.38	3.20	0.18	N

*$\overline{X}n$ = Mean of Needed; $X\overline{p}$ = Mean of Performance; PG = Performance Gap; N = Needed; NN = Not Needed

The result on Table 4 reveals that eight out of the ten listed items have positive performance gap values while the other two items (items 37 and 40) have negative performance gap values. This implies that technical teachers need the eight intrapersonal competency items for effective teaching of Basic Technology in Secondary schools in Cross River State while the other two items are not needed. Table 4 also shows that the grand mean for all the items has a performance gap value of 0.18 which is positive. This

indicates that the technical teachers generally need all the 10 intrapersonal competencies for effective teaching of Basic Technology in Secondary schools in Cross River State with less emphasis on the two items which have negative performance gap values.

Research Question 5.

What are the interpersonal competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools

Table 5: Performance Gap Analysis of the Mean Ratings of the Responses of the Respondents on the Interpersonal Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

n =78

S/N	Interpersonal Competencies	$\bar{X}n$	$\bar{X}p$	Gap $\bar{X}n-\bar{X}p$	Remarks
45	Ability to be sensitive to others feelings and problems in your place of work	3.33	3.02	0.31	N
46	Ability to share ideas and resources with colleagues	3.53	3.14	0.39	N
47	Ability to understand the power relationships in ones group or organization	2.29	3.48	-1.19	NN
48	Ability to help others achieve their long term development goals/needs	3.67	3.48	0.19	N
49	Ability to use effective tactics for persuasion	2.71	3.54	-0.80	NN
50	Ability to communicate openly and convincingly with colleagues at your place of work	2.55	3.40	-0.85	NN
51	Ability to negotiate and resolve disagreements among colleagues/students easily	3.27	3.02	0.25	N

Table 5 Contd.
Performance Gap Analysis of the Mean Ratings of the Responses of the Respondents on the Interpersonal Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

n =78

S/N	Interpersonal Competencies	$\bar{X}n$	$\bar{X}p$	Gap $\bar{X}n-\bar{X}p$	Remarks
52	Ability to inspire and lead other individuals/groups in the school	3.37	3.18	0.19	N
53	Ability to initiate change in a group or organization	3.69	3.29	0.40	N

54	Ability to establish beneficial relationships in one's place of work	3.94	3.46	0.48	N
55	Ability to work well with other individuals/groups in the school toward common goals	4.01	3.65	0.36	N
56	Ability to create group synergy in pursuing collective goals	3.41	3.27	0.14	N
	Grand Mean	3.31	3.22	0.09	N

*$\overline{X}n$ = Mean of Needed; $X\overline{p}$ = Mean of Performance; PG = Performance Gap; N = Needed; NN = Not Needed

The result on Table 5 shows the performance gap analysis of the responses on the interpersonal competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State. As depicted in Table 5, nine out of the twelve listed items have positive performance gap values while the other three items (items 47, 49 and 50) have negative performance gap values. This implies that the nine interpersonal competency items are needed by technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State while the other three items are not needed. Table 5 also shows that the grand mean for all the items has a performance gap value which is positive. This indicates that the technical teachers generally need all the 12 interpersonal competencies for effective teaching of Basic Technology in Secondary schools in Cross River State with less emphasis on the three items which have negative performance gap values.

Research Question 6.

What are the laboratory management competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State?

Table 6: Performance Gap Analysis of the Mean Ratings of the Responses of the Respondents on the Laboratory Management Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

n =78

S/N	Laboratory Management Competencies	$\overline{X}n$	$\overline{X}p$	Gap $\overline{X}n$-$\overline{X}p$	Remarks

57	Ability to develop and implement students discipline policy/guidelines in the laboratory	3.60	3.32	0.28	N
58	Ability to oversee workshop training	3.92	3.42	0.50	N
59	Ability to carry out preventive maintenance in the workshop	3.74	3.53	0.21	N
60	Ability to develop an effective accident reporting system	4.18	3.85	0.33	N
61	Ability to keep inventory of available tools, equipment and materials in the workshop	2.41	3.40	-0.99	NN
62	Ability to record the techniques by which equipment is repaired	3.50	3.28	0.22	N
63	Ability to supervise laboratory members in achieving research project tasks	2.31	3.46	-1.15	NN
64	Ability to arrange tools and equipment for easy identification	2.41	3.54	-1.13	NN
65	Ability to ensure that tools and materials needed for practical lessons are made available before commencement of the lesson	3.79	3.25	0.54	N
66	Ability to maintain good housekeeping	3.41	3.26	0.15	N
67	Ability to conduct safety inspection regularly	3.44	3.28	0.16	N
68	Ability to maintain consumable supply inventory	3.44	3.16	0.28	N
	Grand Mean	3.36	3.12	0.24	N

*$\overline{X}n$ = Mean of Needed; $X\overline{p}$ = Mean of Performance; PG = Performance Gap; N = Needed; NN = Not Needed

The result on Table 6 reveals that nine out of the 12 listed items have positive performance gap values while the other three four items (items 61,63 and 64) have negative performance gap values. This implies that technical teachers need the nine laboratory management competency items for effective teaching of Basic Technology in Secondary schools in Cross River State while the other three items are not needed. Table 6 also shows that the grand mean for all the items has a performance gap value of 0.24 which is positive. This indicates that the technical teachers generally need all the 12 laboratory management competencies for effective teaching of Basic Technology in Secondary schools in Cross River State with less emphasis on the three items which have negative performance gap values.

Research Question 7:

What are the affective work competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State?

Table 7: Performance Gap Analysis of the Mean Ratings of the Responses of the Respondents on the Affective work Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

n =78

S/N	Affective Work Competencies	$\bar{X}n$	$\bar{X}p$	Gap $\bar{X}n$-$\bar{X}p$	Remarks
69	Ability to be emotionally stable	3.72	3.43	0.29	N
70	Ability to maintain Positive work habits	2.56	3.54	-0.98	NN
71	Ability to be punctual to work always	2.20	3.58	-1.38	NN
72	Ability to be dedicated to duties	2.42	3.56	-1.14	NN
73	Ability to be independent	3.32	3.41	-0.09	NN
74	Ability to be careful at work always	3.46	3.28	0.18	N
75	Ability to be loyal to authorities	2.22	3.52	-1.30	NN
76	Ability to be honest	2.28	3.61	-1.33	NN
77	Ability to be resourceful	2.79	3.53	-0.74	NN
78	Ability to maintain high level of etiquette	2.53	3.62	-1.09	NN
79	Ability to be sociable	2.62	3.35	-0.73	NN
80	Ability to be creative	3.18	3.68	-0.50	NN
	Grand Mean	2.77	3.49	-0.72	NN

*$\overline{X}n$ = Mean of Needed; $X\overline{p}$ = Mean of Performance; PG = Performance Gap; N = Needed; NN = Not Needed

The result on Table 7 shows the performance gap analysis of the responses on the affective work competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State. As depicted in Table 7, ten out of the twelve listed items have negative performance gap values while only two items (items 69 and 74) have positive performance gap values. This implies that the 10 affective work competency items are not needed by technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State while the other two items are needed. Table 7 also shows that the grand mean for all the items has a performance gap value which is negative. This indicates that the technical teachers generally do not need the affective work competencies for effective teaching of Basic Technology in Secondary schools in Cross River State with the exception of the two items which have positive performance gap values.

Research Question 8:

What are the Instructional materials development and utilisation competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State?

Table 8: Performance Gap Analysis of the Mean Ratings of the Responses of the Respondents on the Instructional Materials Development and Utilisation Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

n =78

S/N	Instructional Materials Development and Utilisation Competencies	$\bar{X}n$	$\bar{X}p$	Gap $\bar{X}n-\bar{X}p$	Remarks
81	Ability to make and use wall charts for teaching	2.96	3.47	-0.51	NN
82	Ability to make and use flip charts for teaching	2.60	3.69	-1.09	NN
83	Ability to make and use flannel boards for teaching	3.66	3.32	0.34	N
84	Ability to make and use good pictures for teaching	2.43	3.65	-1.22	NN
85	Ability to develop simple educational videos for teaching	4.01	3.73	0.28	N
86	Ability to improvise several types of instructional materials	3.41	3.26	0.15	N

Table 8 Contd.
Performance Gap Analysis of the Mean Ratings of the Responses of the Respondents on the Instructional Materials Development and Utilisation Competency Needs of Technical Teachers for Effective Teaching of Basic Technology in Secondary Schools

n =78

S/N	Instructional Materials Development and Utilisation Competencies	$\bar{X}n$	$\bar{X}p$	Gap $\bar{X}n-\bar{X}p$	Remarks
87	Ability to develop and use learning objects for teaching	2.34	3.48	-1.14	NN

88	Ability to make and use three dimensional models for teaching	2.27	3.64	-1.37	NN
89	Ability to utilize real objects, machines and tools for demonstration	3.74	3.60	0.14	N
90	Ability to make and use two dimensional paper cut outs for teaching	2.16	3.44	-1.28	NN
	Grand Mean	2.96	3.54	-0.58	NN

*$\overline{X}n$ = Mean of Needed; $X\overline{p}$ = Mean of Performance; PG = Performance Gap; N = Needed; NN = Not Needed

The result on Table 8 reveals that four out of the ten listed items have positive performance gap values while the other six items have negative performance gap values. This implies that technical teachers need the four instructional materials development and utilisation competency items for effective teaching of Basic Technology in Secondary schools in Cross River State while the other six items are not needed. Table 8 also shows that the grand mean for all the items has a performance gap value of -0.58 which is negative. This indicates that the technical teachers generally do not need the instructional materials development and utilisation competencies for effective teaching of Basic Technology in Secondary schools in Cross River State with the exception of the four items which have positive performance gap values.

Testing of Hypotheses

Hypothesis 1 There is no significant difference in the mean responses of male and female technical teachers on their pedagogical competency needs for effective teaching of Basic Technology in Secondary schools in Cross River State

Table 9: The z-Test Analysis of the Mean Responses of Male and Female Technical Teachers on Pedagogical Competency Needs For Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	Pedagogical Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks
	Competency in:							
1	stating lesson objectives correctly in the three domains of learning.	3.35	0.61	3.11	0.36	2.02	1.98	S
2	using a variety of instructional techniques to teach.	3.18	0.64	3.02	0.74	0.81	1.98	NS

3	developing instruments for assessing students perform ance in the three domains of learning.	3.29	0.47	3.05	0.56	1.65	1.98	NS
4	organizing learning materials logically.	3.29	0.92	3.11	0.93	0.70	1.98	NS
5	connecting lessons with students life experiences.	3.47	0.79	3.16	0.95	1.21	1.98	NS
6	concluding lesson appropriately.	2.47	0.62	2.57	0.49	0.71	1.98	NS
7	engaging students in activities that encourage them to think critically and construct knowledge by themselves.	3.35	1.11	2.93	1.12	1.36	1.98	NS
8	selecting instructional materials correctly.	2.59	0.51	2.77	0.42	-1.56	1.98	NS
9	setting examination questions to cover various cognitive levels.	3.64	0.86	3.77	0.80	-0.55	1.98	NS
10	arranging counselling programme based on assessment results.	3.17	1.07	3.34	1.19	-0.55	1.98	NS
11	using various methods in motivating students to learn.	3.47	0.72	3.26	0.99	0.80	1.98	NS
12	explaining difficult/ abstract concepts clearly.	3.00	0.71	3.16	0.71	-0.59	1.98	NS
	Grand Mean	3.19	0.49	3.10	0.37	0.77	1.98	NS

* S = Significant, NS = Not Significant, n_1 population of female teachers, n_2 = population of male teachers $\overline{X}_1$ = mean of female teachers, $\overline{X}_2$ = mean of male teachers

The result of the z-test analysis of the mean responses of male and female technical teachers on their pedagogical competency needs for effective teaching of Basic Technology is presented in Table 9. Table 9 shows that 11 out 12 items have z-calculated values less than the z-critical (1.98) at 0.05 level of significance. Only one of the items has z-calculated value greater than the z-critical value of 1.98. Table 9 further reveals that based on the grand mean, the z-calculated (0.77) is less than the z-critical (1.98) at 76 degree of freedom. On this basis, the null hypothesis is upheld implying that there is

generally no significant difference in the mean responses of male and female technical teachers on their pedagogical competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

Hypothesis 2. There is no significant difference in the mean responses of male and female technical teachers on their classroom management competency needs for effective teaching of Basic Technology in Secondary schools in Cross River State

Table 10: The z-Test Analysis of the Mean Responses of Male And Female Technical Teachers on Classroom Management Competency Needs For Effective Teaching Of Basic Technology (n_1 =17, n_2 = 61)

S/N	Classroom management competencies	$\overline{X}_1$	SD_1	$\overline{\overline{X}}_2$	SD_2	z-cal	z-crit	Remarks
1	Competency in using effective classroom management techniques.	3.64	0.61	3.52	0.65	0.69	1.98	NS
2	Competency in time management	3.53	0.751	3.16	0.77	1.82	1.98	NS
3	Competency in large classroom management.	3.64	0.79	3.30	0.88	1.49	1.98	NS
4	Competency in effective management of handicapped students.	3.59	0.62	3.11	0.86	2.12	1.98	S

Table 10 Contd.

The z-Test Analysis of the Mean Responses of Male And Female Technical Teachers on Classroom Management Competency Needs For Effective Teaching Of Basic Technology (n_1 =17, n_2 = 61)

S/N	Classroom management competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks
5	Competency in identifying and solving students problems.	3.71	0.68	3.21	0.76	2.42	1.98	S
6	Competency in using various methods of managing stubborn/ problematic students.	2.59	0.62	2.44	0.53	0.96	1.98	NS

7	Competency in ensuring that few students do not dominate class discussion.	3.41	0.51	3.59	0.84	-0.83	1.98	NS
8	Competency in using various methods of managing exceptional students.	2.35	0.49	2.29	0.49	0.43	1.98	NS
9	Competency in maintaining effective discipline in class.	2.88	0.78	2.45	0.65	2.27	1.98	S
10	Competency in establishing and enforcing rules of behaviour in class.	3.71	0.77	3.44	0.74	1.28	1.98	NS
	Grand Mean	3.31	0.31	3.05	0.28	1.27	1.98	NS

* S = Significant, NS = Not Significant, n_1 population of female teachers, n_2 = population of male teachers $\overline{X}_1$ = mean of female teachers, $\overline{X}_2$ = mean of male teachers

The result of the z-test analysis of the mean responses of male and female technical teachers on their classroom management competency needs for effective teaching of Basic Technology in secondary schools in Cross River State is presented in Table 10. Table 10 revealed that significance difference were seen in items 16, 17 and 21 whereas significance difference were not seen in items 13, 14, 15, 18, 19, 20 and 22 as the value of z-calculated were less than the z-critical value of 1.98 at 0.05 level of significance. Table further reveals that based on the grand mean, the z-calculated (1.27) is less than the z-critical value of 1.98 at 76 degree of freedom. On this basis, the null hypothesis is retained implying that there is no significant difference in the mean responses of male and female technical teachers on their classroom management competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

Hypothesis 3. There is no significant difference in the mean responses of male and female technical teachers on ICT competency needs for effective teaching of Basic Technology in Secondary schools in Cross River State

Table 11: The z-Test Analysis of the Mean Responses of Male and Female Technical Teachers on ICT Competency Needs For Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	ICT Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks

	Competency in:							
1	using word processing in preparing lesson notes.	3.94	0.88	2.98	0.92	2.81	1.98	S
2	using different search engines to source for materials.	3.70	0.98	3.26	1.58	2.11	1.98	S
3	using the internet to download videos/images for instructional use.	4.35	0.86	4.06	1.04	1.04	1.98	NS
4	web page design.	4.24	0.90	3.21	1.08	2.56	1.98	S
5	using spreadsheet to prepare examination result.	3.82	0.95	3.46	0.97	1.37	1.98	NS
6	using computer aided design to teach technical drawing.	4.23	0.90	3.96	0.95	1.04	1.98	NS
7	using electronic mail for instructional purpose.	4.11	0.93	3.34	0.93	2.03	1.98	S
8	using CD writers, flash drives and floppy discs to copy	4.00	0.93	3.50	0.95	1.88	1.98	NS
9	using powerpoint for instructional delivery.	4.17	0.88	3.85	0.79	1.45	1.98	NS
10	using video conferencing for instructional delivery.	4.17	0.87	3.78	0.96	1.49	1.98	NS
11	using technology tools to collect/analyse data.	4.23	0.90	4.32	0.78	-0.41	1.98	NS
12	using cloud technology to enhance teaching and learning.	4.24	0.90	3.67	1.07	1.97	1.98	NS
	Grand Mean	4.10	0.80	3.62	0.62	1.51	1.98	NS

* S = Significant, NS = Not Significant, n_1 population of female teachers, n_2 = population of male teachers $\overline{X}_1$ = mean of female teachers, $\overline{X}_2$ = mean of male teachers

The result on Table 11 shows the z-test analysis of the mean responses of male and female technical teachers on their ICT competency needs for effective teaching of Basic Technology in secondary schools in Cross River State. As Table 11 reveals that items 23, 24, 26 and 29 have their z-calculated values greater than the z-critical of 1.98 at 0.05 level of significance. Significance difference were not seen in items 25, 27, 28, 30, 31, 32, 33 and 34 simple because the z-calculated for each item is less than the z-critical of 1.98 at 0.05 level of significance. Table 11 further reveals that based on the grand mean,

the z-calculated (1.51) is less than the z-critical (1.98) at 76 degree of freedom. On this basis, the null hypothesis is retained implying that there is no significant difference in the mean responses of male and female technical teachers on their information and communication technology competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

Hypothesis 4. There is no significant difference in the mean responses of male and female technical teachers on intrapersonal competency needs for effective teaching of Basic Technology in Secondary schools in Cross River State

Table 12: The z-Test Analysis of the Mean Responses of Male And Female Technical Teachers on Intrapersonal Competency Needs For Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	Intrapersonal Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks
	Competency in:							
1	understanding my personal feelings /emotions accurately.	4.45	0.51	3.47	1.08	2.86	1.98	S
2	recognizing how my emotions affect my job performance as a Basic Technology teacher.	4.11	0.86	3.62	0.98	1.88	1.98	NS

Table 12 Contd.
The z-Test Analysis of the Mean Responses of Male And Female Technical Teachers on Intrapersonal Competency Needs For Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	Intrapersonal Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks
3	knowing my strengths and limitations.	2.2	0.44	2.59	0.72	-1.94	1.98	NS

		72 - 1.94 0. 06 NS						
4	having a strong sense of myself value and talents in my area of specialisation.	4.12	0.78	3.95	0.73	0.81	1.98	NS
5	keeping reckless feelings and worrying emotions under control when provoked.	3.59	1.23	3.02	1.06	1.90	1.98	NS
6	maintaining a high degree of honesty and integrity in my place of work.	2.65	0.79	2.52	0.70	0.62	1.98	NS
		0.6 2 0 .54						
7	being flexible in handling unexpected change.	3.29	1.16	3.87	0.94	2.12	1.98	S
8	being persistent in pursuing goals despite obstacles and setbacks.	4.12	0.78	3.46	1.16	2.20	1.98	S
9	being ready to act on any available opportunities.	4.11	0.86	3.30	0.97	3.16	1.98	S
10	always trying hard to meet a standard of excellence in my job.	3.82	0.64	3.30	1.07	1.93	1.98	NS
	Grand Mean	3.66	0.49	3.30	0.47	1.49	1.98	NS

* S = Significant, NS = Not Significant, n_1 population of female teachers, n_2 = population of male teachers $\overline{X}_1$ = mean of female teachers, $\overline{X}_2$ = mean of male teachers

The result on Table 12 shows the z-test analysis of the mean responses of male and female technical teachers on their intra-personal competency needs for effective teaching of Basic Technology in secondary schools in Cross River State. As Table 12 reveals, the calculated z-values for items 37, 38, 39, 40 and 44 are less than the z-critical of 1.98 at 0.05 level of significance. The z-calculated values for items 41, 42 and 43 are greater than the z-critical value of 1.98 at 0.05 level of significance. Table 12 further reveals that based on the grand mean, the z-calculated (1.49) is less than the z-critical (1.98) at 76 degree of freedom. Since the calculated values of z are not significant for majority of the items, the null hypothesis is upheld implying that there is no significant difference in the mean responses of male and female technical teachers on their intra-personal competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

Hypothesis 5. There is no significant difference in the mean responses of male and female technical teachers on interpersonal competency needs for effective teaching of Basic Technology in Secondary schools in Cross River State.

Table 13: The z-Test Analysis of the Mean Responses of Male and Female Technical Teachers on Interpersonal Competency Needs for Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	Interpersonal Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks
1	Competency in being sensitive to others feelings and problems in one's place of work.	3.88	0.48	3.18	0.88	3.13	1.98	S
2	Competency in sharing ideas and resources with colleagues.	3.88	0.48	3.44	0.65	2.60	1.98	S
3	Proficiency in understanding the power relationships in ones group or organisation	2.06	0.24	2.36	0.75	-1.62	1.98	NS
4	Competency in helping others to achieve their long term							

	development goals	4.06	0.43	3.55	0.85	2.35	1.98	S
5	Proficiency in the use of effective tactics for persuasion.	3.23	0.97	2.55	0.74	3.11	1.98	S

Table 13 Contd.

The z-Test Analysis of the Mean Responses of Male and Female Technical Teachers on Interpersonal Competency Needs for Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	Interpersonal Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks
6	Competency in communicating openly and convincingly with colleagues in one's place of work.	2.52	0.72	2.56	0.62	2.16	1.98	S
7	Proficiency in negotiating and resolving disagreements among colleagues /students easily.	3.58	0.51	3.18	0.59	2.59	1.98	S
8	Competency in inspiring and leading other individuals/ groups in the school.	3.64	0.60	3.29	0.67	2.96	1.98	S
9	Proficiency in initiating change in a group or organisation.	4.00	0.35	3.61	0.74	2.13	1.98	S
10	Proficiency in establishing beneficial relationships in one's place of work.	4.23	0.56	3.85	0.72	1.01	1.98	NS
11	Competency in working with							
12	Competency in creating group synergy in pursuing collective goals.	3.82	0.73	3.39	1.03	1.96	1.98	NS
	Grand Mean	3.56	0.19	3.25	0.30	4.29	1.98	S

* S = Significant, NS = Not Significant, n_1 population of female teachers, n_2 = population of male teachers $\overline{X}_1$ = mean of female teachers, $\overline{X}_2$ = mean of male teachers

Table 13 shows the result of the z-test analysis of the responses of male and female technical teachers on their inter-personal competency needs for effective teaching of Basic Technology in secondary schools in Cross River State. As Table 13 reveals that the calculated z-values for items 45, 46, 48, 49, 50, 51, 52, 53 and 55 with exception of items number 47, 54 and 56 are greater than the z-critical of 1.98 at 0.05 level of significance. The z-calculated for items 47, 54 and 56 are less than the z-critical value of

1.98 at 0.05 level of significance.. Table 13 further reveals that based on the grand mean, the z-calculated (4.29) is greater than the z-critical (1.98) at 76 degree of freedom. On this basis, the null hypothesis is rejected implying that there is a significant difference in the mean responses of male and female technical teachers on their interpersonal competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

Hypothesis 6. There is no significant difference in the mean responses of male and female technical teachers on laboratory management competency needs for effective teaching of Basic Technology in Secondary schools in Cross River Stat Basic Technology in Secondary schools in Cross River State

Table 14: The z-Test Analysis of the Mean Responses of Male and Female Technical Teachers on Laboratory Management Competency Needs for Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	Laboratory Management Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks
	Competency in:							
1	developing and implementing students discipline policy/guidelines in the lab.	4.06	0.83	3.48	0.87	2.45	1.98	S
2	overseeing workshop training.	3.53	1.12	3.92	0.82	2.31	1.98	S
3	carrying out preventive maintenance in the workshop.	3.52	0.72	3.80	0.79	-1.29	1.98	NS
4	developing an effective accident reporting system.	4.47	0.62	4.09	0.72	1.93	1.98	NS
5	keeping inventory of tools and materials in the workshop.	2.00	0.00	2.46	0.84	-2.22	1.98	NS
6	recording the techniques by which equipment is repaired.	3.52	1.12	3.49	0.81	0.16	1.98	NS
7	supervising laboratory staff in achieving research project tasks.	2.11	0.33	2.36	0.46	-1.94	1.98	NS

8	arranging tools and equipment for easy identification.	2.29	0.46	2.44	0.56	-0.99	1.98	NS
9	ensuring that tools and materials needed for practical lessons are made available before commencement of the lesson.	4.11	0.93	3.70	1.10	1.41	1.98	NS

Table 14 Contd.

The z-Test Analysis of the Mean Responses of Male and Female Technical Teachers on Laboratory Management Competency Needs for Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	Laboratory Management Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks
10	good housekeeping.	3.64	1.27	3.34	1.07	0.98	1.98	NS
11	conducting safety inspection regularly.	3.94	0.97	3.59	0.88	1.42	1.98	NS
12	maintaining consumable supply inventory.	4.00	1.22	3.27	0.93	2.63	1.98	S
	Grand Mean	3.43	0.39	3.34	0.34	0.57	1.98	S

* S = Significant, NS = Not Significant, n_1 population of female teachers, n_2 = population of male teachers $\overline{X}_1$ = mean of female teachers, $\overline{X}_2$ = mean of male teachers

The result on Table 14 shows the z-test analysis of the mean responses of male and female technical teachers on their laboratory management competency needs for effective teaching of Basic Technology in secondary schools in Cross River State. Table 14 shows that the calculated z-values for items 57, 58 and 68 are greater than the z-critical value of 1.98 at 0.05 level of significance. The z-calculated values for items 59, 60, 61, 62, 63, 65, 66 and 67 are less than the z-critical value of 1.98 at 0.05 level of significance. Table 14 further reveals that based on the grand mean, the z-calculated (0.57) is less than the z-critical (1.98) at 76 degree of freedom. Since the calculated values of z are not significant for majority of the items, the null hypothesis is upheld implying that there is no significant difference in the mean responses of male and female technical teachers on

their laboratory management competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

Hypothesis 7. There is no significant difference in the mean responses of male and female technical teachers on their affective work competency needs for effective teaching of Basic Technology in Secondary schools in Cross River State

Table 15: The z-Test Analysis of the Mean Responses of Male and Female Technical Teachers on Their Affective Work Competency Needs for Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	Affective Work Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remark
1	Emotional stability	4.24	0.90	3.57	0.78	2.97	1.98	S
2	Maintaining Positive work habit	2.18	0.39	2.67	0.47	3.95	1.98	S
3	Punctuality	2.35	0.49	2.16	0.49	1.41	1.98	NS
4	Dedication to duties	2.65	0.49	2.36	0.48	2.15	1.98	S
5	Independence	3.24	0.56	3.34	0.85	0.49	1.98	NS
6	Carefulness	3.29	0.47	3.51	0.67	-1.23	1.98	NS
7	Loyalty	2.53	0.51	2.13	0.34	3.79	1.98	S
8	Honesty	2.24	0.44	2.29	0.56	-.041	1.98	NS
9	Resourcefulness	3.00	0.79	2.74	0.60	1.48	1.98	NS
10	Etiquette	2.76	0.44	2.48	0.50	2.15	1.98	NS
11	Sociability	2.71	0.47	2.61	0.53	0.70	1.98	NS
12	Creativity	3.41	1.00	3.11	0.93	1.14	1.98	NS
	Grand Mean	2.88	0.19	2.75	0.17	1.55	1.98	NS

* S = Significant, NS = Not Significant, n_1 population of female teachers, n_2 = population of male teachers $\overline{X}_1$ = mean of female teachers, $\overline{X}_2$ = mean of male teachers

Table 15 shows the result of the z-test analysis of the responses of male and female technical teachers on their affective work competency needs for effective teaching of Basic Technology in secondary schools in Cross River Stat15 indicates that items 69, 70, 72 and 75 have their z-calculated values greater than the z-critical value of 1.98 at 0.05 level of significance. All other items have their z-calculated values less than the z-critical

value of 1.98. Table 15 further reveals that based on the grand mean, the z-calculated (1.55) is less than the z-critical (1.98) at 76 degree of freedom. On this basis, the null hypothesis is upheld implying that there is no significant difference in the mean responses of male and female technical teachers on their affective work competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

Hypothesis 8. There is no significant difference in the mean responses of male and female technical teachers on their instructional materials development and utilisation competency needs for effective teaching of Basic Technology in Secondary schools in Cross River State.

Table 16 The z-Test Analysis of the Mean Responses of Male and Female Technical Teachers on Their Instructional Materials Development and Utilisation Competency Needs for Effective Teaching of Basic Technology (n_1 =17, n_2 = 61)

S/N	Instructional Materials Development and Utilisation Competencies	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	z-cal	z-crit	Remarks
	Competency in:							
1	making and using wall charts for teaching.	3.59	0.51	2.79	0.86	3.66	1.98	S
2	making and using flip charts for teaching.	2.88	0.78	2.53	0.59	2.04	1.98	S
3	making and using flannel boards for teaching.	4.00	0.35	3.57	0.78	2.17	1.98	S
4	making and using good pictures for teaching.	2.18	0.53	2.51	0.69	-1.82	1.98	NS
5	developing simple educational videos for teaching.	3.88	0.70	3.29	1.04	-1.07	1.98	NS
6	improvising different types of instructional materials.	3.82	0.73	3.29	1.04	1.96	1.98	NS
7	developing and using learning objects for teaching.	2.35	0.70	2.34	0.51	0.06	1.98	NS
8	making and using three dimensional models for teaching.	2.12	0.49	2.31	0.72	-1.04	1.98	NS
9	utilizing real objects, machines and tools for demonstration.	3.53	0.72	3.80	0.79	-1.29	1.98	NS

10	making and using two dimensional paper cut outs for teaching.	2.12	0.49	2.18	0.39	-0.56	1.98	NS
	Grand Mean	3.05	0.15	2.94	0.20	0.41	1.98	NS

* S = Significant, NS = Not Significant, n_1 population of female teachers, n_2 = population of male teachers, $\overline{X}_1$ = mean of female teachers, $\overline{X}_2$ = mean of male teachers

Table 16 shows the result of the z-test analysis of the responses of male and female technical teachers on their instructional materials development and utilisation competency needs for effective teaching of Basic Technology in secondary schools in Cross River State. Table 16 reveals that the items 81, 82, and 83 have their z-calculated values greater than the z-critical value of 1.98 at 0.05 lvel of significance. All other items have their calculated z-values less than the z-critical at 0.05 level of signifaince. Table 16 further reveals that based on the grand mean, the z-calculated (0.41) is less than the z-critical (1.98) at 76 degree of freedom. On this basis, the null hypothesis is accepted implying that there is no significant difference in the mean responses of male and female technical teachers on their instructional materials development and utilisation competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

Summary of the Study

From the data collected and analysed in the study, the following findings were made with respect to the research questions and hypotheses of the study:

1. Ten items were found as the pedagogical competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State. These were:

(i) Competency in stating lesson objectives correctly in the three domains of learning,

(ii) Competency in using a variety of instructional techniques to teach,

(iii) Competency in developing appropriate instruments for assessing students' performance in the three domains of learning,

(iv) Competency in organising learning materials logically,

(v) Competency in connecting lessons with students life experiences,

(vi) Competency in engaging students in activities that encourage them to think critically and construct knowledge by themselves,

(vii) Competency in setting examination questions to cover various cognitive levels (Knowledge, application, analysis, etc),

(viii) Competency in arranging counselling programme based assessment results,

(ix) Competency in using various methods in motivating students to learn, and

(x) Competency in explaining difficult/abstract concepts clearly.

2. Seven classroom management competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools were found. These include:

(i) Competency in using effective classroom management techniques,

(ii) Competency in time management,

(iii) Competency in large classroom management,

(iv) Competency in effective management of handicapped students,

(v) Competency in identifying and solving students problems,

(vi) Competency in ensuring that few students do not dominate class discussion, and

(vii) Competency in establishing and enforcing rules of behaviour in class.

3. Twelve information and communication technology (ICT) competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools were found. These include:

(i) Competency in using word processing in preparation of lesson notes,

(ii) Competency in the use of different search engines to source for educational materials,

(iii) Competency in the use of internet to download videos/images for instructional use,

(iv) Competency in web page design,

(v) Competency in the use of spreadsheet to prepare students examination result,

(vi) Competency in the use of computer aided design (AUTOCAD) to teach technical drawing

(vii) Competency in the use of electronic mail (e-mail) for instructional purpose,

(viii) Competency in the use of CD writers, flash drives and floppy discs for copying files,

(ix) Competency in using powerpoint for instructional delivery,

(x) Competency in using video conferencing for instructional delivery,

(xi) Competency in the use of technology tools to collect/analyse educational data, and

(xii) Competency in using cloud technology to enhance teaching and learning.

4. Eight intra-personal competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State were found. These were:

(i) Competency in understanding my personal feelings/emotions accurately,

(ii) Competency in recognising how my emotions affect my job performance as a Basic Technology teacher,

(iii) Competency in having a strong sense of myself value and talents in my specific area of specialization,

(iv) Competency in keeping reckless feelings and worrying emotions under control when provoked,

(v) Competency in being flexible in handling unexpected change,

(vi) Competency in being persistent in pursuing goals despite obstacles and setbacks,

(vii) Competency in being ready to act on any available opportunities, and

(viii) Competency in always trying hard to meet a standard of excellence in my job.

5. Nine inter-personal competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State were found. These include:

(i) Competency in being sensitive to others feelings and problems in one's place of work,

(ii) Competency in sharing ideas and resources with colleagues,

(iii) Competency in helping others to achieve their long term development goals/ needs,

(iv) Proficiency in negotiating and resolving disagreements among colleagues/students easily,

(v) Competency in inspiring and leading other individuals/groups in the school,

(vi) Proficiency in initiating change in a group or organization,

(vii) Proficiency in establishing beneficial relationships in one's place of work,

(viii) Competency in working with other individuals/groups in the school toward common goals, and

(ix) Competency in creating group synergy in pursuing collective goals.

6. Nine laboratory management competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State were found. These include:

(i) Competency in developing and implementing students discipline policy/guidelines in the laboratory,

(ii) Proficiency in overseeing workshop training ,

(iii) Competency in carrying out preventive maintenance in the workshop,

(iv) Competency in developing an effective accident reporting system,

(v) Proficiency in recording the techniques by which equipment is repaired,

(vi) Competency in ensuring that tools and materials needed for practical lessons are made available before commencement of the lesson,

(vii) Competency in good housekeeping,

(viii) Competency in conducting safety inspection regularly, and

(ix) Competency in maintaining consumable supply inventory.

7. Four items are the affective work competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State. These were:

(i) Emotional stability,

(ii) Independence,

(iii) Carefulness, and

(iv) Creativity.

8. Four Instructional materials development and utilisation competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools in Cross River State were found in the study. These were:

(i) Competency in making and using flannel boards for teaching,

(ii) Competency in developing simple educational videos for teaching,

(iii) Competency in improvising several types of instructional materials, and

(iv) Competency in utilizing real objects, machines and tools for demonstration.

9. There is generally no significant difference in the mean responses of male and female technical teachers on their pedagogical competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

10. There is no significant difference in the mean responses of male and female technical teachers on their classroom management competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

11 There is no significant difference in the mean responses of male and female technical teachers on their information and communication technology competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

12. There is no significant difference in the mean responses of male and female technical teachers on their intra-personal competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

13. There is a significant difference in the mean responses of male and female technical teachers on their interpersonal competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

14. There is no significant difference in the mean responses of male and female technical teachers on their laboratory management competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

15. There is no significant difference in the mean responses of male and female technical teachers on their affective work competency needs for effective teaching of Basic Technology in secondary schools in Cross River State.

16. There is no significant difference in the mean responses of male and female technical teachers on their instructional materials development and utilisation competency needs for effective teaching of Basic Technology in secondary schools in Cross River Sta

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This chapter presents the discussion of the findings, implications of the study, conclusion, recommendations, limitations of the study and suggestions for further studies.

Discussion of Findings

Findings of the study are discussed in this section under relevant variables in the study as follows:

Pedagogical competency needs of technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State

Findings of the study revealed that pedagogical competency needs of technical teachers for effective teaching of Basic Technology include ability to state lesson objectives correctly in the three domains of learning, use a variety of instructional techniques to teach, develop appropriate instrument for assessing students' performance in three domains of learning and organize learning materials logically. Others are ability to connect lessons with students' life experiences; engage students in activities that encourage them think critically and construct knowledge by themselves; set examination questions to cover various cognitive levels (knowledge, application, analysis, etc); arrange counselling programme based assessment result; use various methods in motivating students to learn and explain difficult/abstract concept clearly.

These findings indicate that the teachers of Basic Technology in secondary schools in Cross River State need additional training on these ten areas to facilitate their effective teaching. These findings are obvious. This is because a teacher need to be competent in stating lesson objectives correctly in the three domains of learning; use a variety of instructional techniques to teach; develop appropriate instruments for assessing students' performance in the three d 129 s of learning as well as in organising learning materials logically. These findings support that of Kumazhege and Zira (2010), Akhyak, Idrus and Bakar (2013) who identified the ability of describing objectives, selecting materials and organizing materials logically as some of the important pedagogical competencies teachers should possess. They noted that teachers need to be competent in

pedagogical knowledge and skills because it helps them to plan teaching and learning programme, to execute the interaction, manage the learning process and also make proper assessment. They emphasised that pedagogical competency is very indispensable for teachers as it facilitates effective planning of lessons, making decisions about lesson pace, explaining materials clearly, and responding to individual differences in how students learn. The findings further lend credence to the views of Vandi, Wampana and Shanga (2017) and Samba and Odo (2010) who noted that pedagogical knowledge and skills are considered indispensable because teaching effectiveness is greatly improved when teachers display a variety of pedagogical skills in their lesson presentations. These findings align itself with the findings of Onu and Muhammed (2014) which affirmed that improvement is needed in pedagogical competencies of technical teachers to boost effective teaching of Basic Technology.

Classroom Management competency needs of technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State

Findings of the study showed that classroom management competency needs of technical teachers for effective teaching of Basic Technology include ability to use effective classroom management techniques; manage time; manage large classroom, and effectively manage handicapped students. Others include ability to identify and solve students' problems; ensure that few students do not dominate class discussion and establish and enforce rules of behaviour in class.

This findings support the ones made by Los Angeles county Office of Education (2000) which identified similar competencies as being very indispensable for effective classroom management. This source pointed out that good classroom management minimizes the likelihood of misbehavior. With respect to competency in establishing and enforcing rules of behaviour in class, the findings support that of Kratochwill, Deroons

and Blair (2014) who identified ability to manage the classroom environment, the physical space, furnishings, resources and materials as well as students' attitudes and emotions properly as important classroom management skills teachers should possess. They posited that maintaining discipline is necessary for learning to be effective. He also suggested that students' misbehaviour can be minimized by generally skillful teaching and application of good discipline policy. They stated that "effective teachers manage their classrooms with procedures and routines while ineffective teachers discipline their classrooms with threats and punishments".

Okwori, Owodunni and Abiodun (2015), Austin and Omomie (2014) and Aremu (2015) pointed out that most teachers were not competent in classroom management and were not exposed to ways of improving classroom management skills. They noted that effective classroom management would likely influence the academic performance of the students and guarantee the right students' outcomes desired by the school.

Information and Communication Technology (ICT) competency needs of technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State

Findings of the study revealed that Information and Communication Technology (ICT) competency needs of technical teachers for effective teaching of Basic Technology include ability to use word processing in preparation of lesson notes; different search engines to source for educational materials; internet to download videos/images for instructional use, web page design and spreadsheet to prepare examination result. Others were ability to use computer aided design (AUTOCAD) to teach technical drawing; electronic mail (e-mail) for instructional purpose; CD writers, flash drives and floppy discs for copying files; powerpoint for instructional delivery; video conferencing for instructional delivery; technology tools to collect/analyse educational data and cloud technology to enhance teaching and learning.

These findings obviously indicate that the teachers are not competent in these areas hence they need additional training to enable them teach Basic Technology in Secondary schools effectively. The finding of the study with respect to competency in using word processing in preparation of lesson notes; competency in the use of different search engines to source for educational materials as well as competency in the use of internet to download videos/images for instructional use support that of Eze and Okoroafor (2015) and Office of Grant Programmes and Technology (2001) which identified similar items as important ICT skills needed by teachers in the 21st century. These sources specifically pointed out that to succeed in the 21st century classroom, teachers should be able to use technology as a meaningful learning tool, they need to understand the advantages technology can provide for various grade levels and content areas as well as developed full awareness of the concepts of networks, roles, resources and emerging technologies.

Mustapha, Idris, Kutiriko and Ewugi (2016), Ede and Ariyo (2015) observed that numerous ICT competencies were needed by technical teachers. They noted that retraining of technical teachers is necessary for the attainment of emerging information and communication technology competencies.

Intrapersonal competency needs of technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State

Findings of the study showed that intra-personal competency needs of technical teachers for effective teaching of Basic Technology include ability to understand one's personal feelings/emotions accurately; recognize how one's emotions affect his/her job performance as a Basic Technology teacher; have a strong sense of one's self value and talents in his/her specific area of specialisation and keep reckless feelings and worrying emotions under control when provoked. Others include ability to be flexible in handling unexpected change; persistent in pursuing goals despite obstacles and set backs; ready to

act on any available opportunities and always trying hard to meet a standard of excellence in one's job.

These findings support those of Vijayalakshmi (2010), Udoudo and Maigida (2013) who identified ability to accurately perceive, identify and understand one's personal feelings/emotions; ability to recognize how one's emotions affect his/her job performance; ability to have a strong sense of one's self value and talents in his/her specific area of provision and ability to keep reckless feelings and worrying emotions under control when provoked as some of the intra-personal competencies needed by vocational education teachers. These findings lend credence to the assertions of Alio (2006), Robles (2012) and Selvi (2010) that there is a very close relationship between teachers' intra-personal competencies, particularly, emotional competencies and students performance. According to them, this is because teachers emotional competencies are very important as it can help students to learn and also help teachers become effective teachers. According to him, learning is an emotional activity hence students willingness to learn can be increased if teachers know how to improve the emotional dimension of students' learning. In addition, learning requires an emotional support that create positive feelings for learning-teaching process.

Interpersonal competency needs of technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State

Findings of the study revealed that inter-personal competencies need of technical teachers for effective teaching of Basic Technology include ability to be sensitive to others feelings and problems in one's place of work; share ideas and resources with colleagues; help others to achieve their long term development goals/ needs; negotiate and resolve disagreements among colleagues/students easily and inspire and lead other individuals/groups in the school. Others were ability to initiate change in a group or organisation; establish beneficial relationships in one's place of work; work

with other individuals/groups in the school toward common goals and create group synergy in pursuing collective goals.

These findings support that of Lindsey and Rice (2015) who identified ability to be sensitive to others feelings and problems in one's place of work; share ideas and resources with colleagues and help others to achieve their long term development goals as some of the inter-personal competencies needed by Vocational education teachers for effective teaching.

Usoro and Anah (2012), Harris and Rogers (2008) also asserted that interpersonal, communication and work ethic competencies were highly needed by both teachers and students inspite of the fact that they were found to be deficient in these competencies.

Laboratory management competency needs of technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State

Findings of the study showed that laboratory management competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools include ability to develop and implement students' discipline policy/guidelines in the laboratory; oversee workshop training; carry out preventive maintenance in the workshop; develop an effective accident reporting system and record the techniques by which equipment is repaired. Others were ability to ensure that tools and materials needed for practical lessons are made available before commencement of the lesson; maintain good housekeeping; conduct safety inspection regularly and maintain consumable supply inventory.

These findings agree with that of Saucier and Mckim (2011), Ogwo and Orannu (2006) who listed ability to develop and implement students' discipline policy/guidelines in the laboratory; oversee workshop training; carry out preventive maintenance in the

workshop; develop an effective accident reporting system as some of the important laboratory management competencies that technical education teachers should possess.

Schlautman and Silleto (2001), Dangasa (2006) pointed out that some technical teachers and technicians possessed a medium level of skills in most of the areas of laboratory management investigated which were not adequate for their efficient maintenance in the workshop. They also noted that technical teachers and technicians need to improve their skills in diagnosing and repairing faulty instruments and equipment in the laboratory.

Affective work competency needs of technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State

Findings of the study found that affective work competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools include ability to be emotional stability, independent, careful and creative. These findings support that of Atsumbe, Raymond, Idris and Mele (2012) and Amuka (2002) who identified punctuality, dependability, reliability, responsibility, dedication, honesty, conscientiousness, ambition, cooperativeness, helpfulness, adaptability and resourcefulness as some of the affective work competencies that technology teachers should posses. These findings underscore the importance of work related attitudes in effective teaching and learning.

Atsumbe and Saba (2008) observed that the engineering and technology education students were deficient in the following skills namely observing safety precautions, development of self confidence, emotional stability and development of positive work habit. They noted that affective work skill, industrial safety and occupational health education be incorporated into the existing curriculum of engineering and technology based programmes. This finding corroborates with the views of Akpan

and Silas (2011) that high training was needed in affective, pedagogical, instructional materials development and utilisation competencies. They pointed out that federal and state government should organize regular retraining programmes for teachers in the state based on the areas of deficiency as identified in the study.

Instructional materials development and utilisation competency needs of technical teachers for effective teaching of Basic Technology in secondary schools in Cross River State

Findings revealed that instructional materials development and utilisation competency needs of technical teachers for effective teaching of Basic Technology in Secondary schools include ability to make and use flannel boards for teaching; develop simple educational videos for teaching; improve several types of instructional materials and utilize real objects, machines and tools for demonstration.

The findings of the study with respect to teachers' competency in instructional materials development lend credence to the views of Olaunde, Fakomogbon, Olabisi and Adetunde (2017), Samba and Odoh (2010) who noted that teachers should be very competent in the development as well as improvisation of various Instructional materials such as flannel boards and simple educational videos. The findings of the study with respect to teachers' competency in instructional materials utilisation supports the views of Ogbu (2016), Olawale (2013) and Umunadi (2009) who pointed out that teachers should be competent in utilizing various instructional materials such as real objects, machines and technology tools for demonstration.

Obviously, the result of this study would greatly boost the competency of Basic technology teachers in Secondary schools in Cross River State. This is because the result of need assessment always lead to programme improvement and personnel improvement. Agreeably, the findings of the study will lead to the emergence of competent teachers that would handle the teaching of Basic Technology in Secondary schools in Cross River

State. This underscores the importance of competent teachers in technical education programmes which is in compliance with one of the principles of vocational education as proposed by Prosser (1949) as cited in Okoro (1993). This principle states that vocational education can only be effective if the teacher/instructor has had sufficient experience and exposure in the application of the skills and knowledge to the operations and processes he undertakes to teach. This implies that if an incompetent teacher is allowed to teach, it would be absolutely impossible for the students to acquire the much needed skills.

Implications of the Findings of the Study

The results of the study have several educational implications. One major findings of the study is that a greater number of technical teachers who are teaching Basic Technology in public secondary schools in Cross River State are not competent on the use of ICT resource. The implication is that subsequent employment of technical teachers in the state should be based on the possession of the needed competencies in ICT.

The study found that there was no significant difference in the mean responses of male and female teachers on seven out of eight technical teachers' competency needs for effective teaching of Basic Technology in public secondary schools in Cross River State. This implies that the deficiency in competencies needed by both male and female teachers could affect the employability capacity of the students as it could be difficult for them to have a smooth transition from school to the world of work.

The findings of the study also revealed that there is a significant difference in the mean responses of male and female technical teachers on interpersonal competency needs for effective teaching of Basic Technology in secondary schools in Cross River State. The implication of this is that students are bound to perform unsatisfactorily in the Basic

Technology examination as the teachers differ significantly in terms of relating positively to the students.

Conclusion

It is a well known fact that the quality of any educational programme is dependent on the quality of the teachers. The quality of Basic Technology teaching in secondary schools in Cross River state appears to be ineffective in facilitating students skills acquisition. This prompted the need for identifying the competencies needed by the teachers for effective teaching.

It was therefore concluded that technical teachers who are teaching Basic technology in secondary schools in Cross River state are generally competent in areas of pedagogy, classroom management, laboratory management, interpersonal, intra-personal and instructional materials development and utilisation hence they do not need much additional training in these areas. Also, it was observed that the teachers of Basic technology in secondary schools in Cross River state are generally incompetent in areas of Information and Communication technology hence they need much additional training in these areas to facilitate effective teaching.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. The Cross River State Ministry of Education and Secondary Education Board should organise regular retraining programmes for technical teachers in the state on those areas where they are found in this study to be deficient particularly on the use of information and communication technology resources This would obviously facilitate effective teaching of Basic technology in Secondary schools in the state.

2. Educational policy makers and curriculum developers should ensure that the identified competency needs of technical teachers are integrated into the curriculum of technical teacher education programmes in colleges of Education and Universities to enable students acquire and develop these competencies in order to facilitate their smooth transition from school to the world of work as well as ensure their success in the labour market when they eventually graduate.
3. The Federal ministry of education should ensure that modern ICT resources are supplied to secondary schools in Cross river state in order to provide opportunities for prospective technical teachers to develop competencies on how to use them.
4. The principals of all secondary schools in Cross River state should henceforth embark on intensive staff development programme in order to enhance the professional competencies of their technical teachers.
5. The Federal and state ministries of education should organize workshops, seminars and conferences to synthesize technical teachers in cross river state on the need to attend professional development programmes such as workshops, seminars and conferences as well as read professional educational journals and books to enable them update their knowledge and skills on recent developments in the education industry.

Suggestions for Further Research

The following suggestions are made for further studies

1. An investigation of the practical competencies required for career success of Basic Technology teachers in Akwa Ibom State, Nigeria.
2. The influence of gender on the professional development needs of Basic Technology teachers in Akwa Ibom State.

3. Influence of demographic variables on the professional development needs of Basic Technology teachers in Akwa Ibom State.

4. A comparative study of the teaching effectiveness of male and female Basic Technology teachers in Akwa Ibom State.

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Appendix A

Distribution of the population for the study

S/N	ZONE	NO.OF LOCAL GOVERNMENT AREA	NO.OF SCHOOL	NO.OF B/TECH TEACHER	
				MALE	FEMALE
1	CALABAR	7	81	23	3
2	IKOM	6	94	22	12
3	OGOJA	5	71	18	4
Total	3	18	246	82	

Source: Planning, Research and Statistics, Secondary Education Board, Calabar, as at July 2016.

Appendix B

Analysis of students' performance in Basic Technology in Basic Education Certificate Examination (BECE) in the Eighteen (18) Local Government Areas of Cross River State.

Year	Total candidates	No. Passed	No. Failed	% Passed	% Failed
2013/2014	13518	6720	6798	49. 7%	50. 2%
2014/2015	15216	7415	7801	48. 7%	51. 2%
2015/2016	16239	7989	8250	49. 2%	50. 8%

Source:-Education Resource Centre (ERC), Ministry of Education, Calabar, Cross River State, July 2016.

Appendix C

Letter of Transmittal

Department of Technology and Vocational Education

Nnamdi Azikiwe University, Awka.

Dear Sir/Madam

Request to complete a questionnaire

I am a postgraduate student of the above named department conducting a research study on technical teachers' competency needs for effective teaching of Basic Technology in junior secondary schools in Cross River State. The attached questionnaire is designed for collecting data for the study. As a technical teacher in my area of study, your input is very essential for the successful conduct of this study. I therefore request you to assist me in completing the questionnaire with the assurance that your inputs will be treated confidentially and used solely for the stated research purpose.

Thank you for your anticipated cooperation.

Yours sincerely,

Michael O. I.
(Researcher)

Appendix D

Questionnaire

QUESTIONNAIRE ON TECHNICAL TEACHERS' COMPETENCY NEEDS FOR TEACHING BASIC TECHNOLOGY IN JUNIOR SECONDARY SCHOOLS IN CROSS RIVER STATE.

Dear respondent,

This questionnaire is designed for obtaining information for a needs assessment study on the above stated topic. Please, kindly give your sincere and objective responses to the items. You are fully assured that all information supplied shall be treated confidentially and used for research purpose only. Thanks.

(Researcher)

PART 1: Personal Data

i. Your Gender Male [ ] Female [ ]

Instruction for Completing PART 2, Sections A to H

This questionnaire contained some competencies which technical teachers may need for effective teaching of Basic Technology in secondary schools. On the left hand side, tick √ on the column that best represent **your perceived level of need** of each competency for effective teaching of Basic Technology in secondary schools. On the right hand side, tick √ on the column that best represent **your expressed level of performance or ability** in each competency. Use the following scale:

Levels of Need		**Levels of Performance (or Ability)**	
Very Highly Needed (VHN)	= 5points,	Very High Performance (VHP)	= 5points;
Highly Needed (HN)	= 4points,	High Performance (HP)	= 4points
Moderately Needed (MN)	= 3points,	Moderate Performance (MP)	= 3points
Slightly Needed (SN)	= 2points	Low Performance (LP)	= 2points
Not Needed (NN)	= 1point	Very Low Performance (VLP)	= 1point

Levels of Need					Section A: Pedagogical Competencies	Levels of Performance				
VHN	HN	MN	SN	NN		VHP	HP	MP	LP	VLP
					1. Ability to state lesson objectives correctly in the three domains of learning					
					2. Ability to use a variety of instructional techniques to teach					
					3. Ability to develop appropriate instruments for assessing students performance in the three domains of learning					
					4. Ability to organise learning materials logically					
					5. Ability to connect lessons with students life experiences					
					6. Ability to conclude lessons appropriately					
					7. Ability to engage students in activities that encourage them to think critically and construct knowledge by themselves					
					8. Ability to select instructional materials correctly					
					9. Ability to set examination questions to cover various cognitive levels					
					10. Ability to arrange counselling programme based assessment results					
					11. Ability to use various methods in motivating students to learn					
					12. Ability to explain difficult/abstract concepts clearly					
VHN	**HN**	**MN**	**SN**	**NN**	**Section B: Classroom Management Competencies**	**VHP**	**HP**	**MP**	**LP**	**VLP**
					13. Ability to use effective classroom management techniques					
					14. Ability to manage class time well					
					15. Ability to manage large classroom well					
					16. Ability to effectively manage handicapped students					
					17. Ability to identify and solve students problems					
					18. Ability to use various methods of managing stubborn/ problematic students					
					19. Ability to ensure that few students do not dominate class discussion					

					20. Ability to use various methods of managing exceptional students					
					21. Ability to maintain effective discipline in class					
					22. Ability to establish and enforce rules of behaviour in class					
VHN	**HN**	**MN**	**SN**	**NN**	**Section C: ICT Competencies**	**VHP**	**HP**	**MP**	**LP**	**VLP**
					23. Ability to use word processing in preparation of lesson notes					
					24. Ability the use different search engines to source for educational materials					
					25. Ability to use internet to download videos/images for instructional use					
					26. Ability to design web pages					
					27. Ability to use spreadsheet to prepare students examination result					
					28. Ability to use computer aided design (AUTOCAD) to teach technical drawing					
					29. Ability to use electronic mails (e-mail) for instructional purpose					
					30. Ability to use CD writers, flash drives and floppy discs for copying files					
					31. Ability to use powerpoint for instructional delivery					
					32. Ability to use video conferencing for instructional delivery					
					33. Ability to use technology tools to collect/analyse data					
					34. Ability to use cloud technology to enhance teaching and learning					
VHN	**HN**	**MN**	**SN**	**NN**	**Section D: Intrapersonal Competencies**	**VHP**	**HP**	**MP**	**LP**	**VLP**
					35. Ability to understand my personal feelings/emotions accurately					
					36. Ability to recognize how my emotions affect my job performance as a Basic Technology teacher					
					37. Ability to know my strengths and limitations					
					38. Ability to have a strong sense of myself value and talents in my specific area of specialization					

					39. Ability to keep reckless feelings and worrying emotions under control when provoked					
					40. Ability to maintain a high degree of honesty and integrity in my place of work					
					41. Ability to be flexible in handling unexpected change					
					42. Ability to be persistent in pursuing goals despite obstacles and set backs					
					43. Ability to readily act on any available opportunities					
					44. Ability to try hard to meet a standard of excellence always in my job teacher					
VHN	**HN**	**MN**	**SN**	**NN**	**Section E: Interpersonal Competencies**	**VHP**	**HP**	**MP**	**LP**	**VLP**
					45. Ability to be sensitive to others feelings and problems in your place of work					
					46 Ability to share ideas and resources with colleagues					
					47. Ability to understand the power relationships in ones group or organization					
					48. Ability to help others achieve their long term development goals/needs					
					49. Ability to use effective tactics for persuasion					
					50. Ability to communicate openly and convincingly with colleagues at your place of work					
					51. Ability to negotiate and resolve disagreements among colleagues/students easily					
					52. Ability to inspire and lead other individuals/groups in the school					
					53. Ability to initiate change in a group or organization					
					54. Ability to establish beneficial relationships in one's place of work					
					55. Ability to work with other individuals/groups in the school toward common goals					

					56. Ability to create group synergy in pursuing collective goals					
VHN	**HN**	**MN**	**SN**	**NN**	**Section F: Laboratory Management Competencies**	**VHP**	**HP**	**MP**	**LP**	**VLP**
					57. Ability to develop and implement students discipline policy/guidelines in the laboratory					
					58. Ability to oversee workshop training					
					59. Ability to carry out preventive maintenance in the workshop					
					60. Ability to develop an effective accident reporting system					
					61. Ability to keep inventory of available tools, equipment and materials in the workshop					
					62. Ability to record the techniques by which equipment is repaired					
					63. Ability to supervise laboratory members in achieving research project tasks					
					64. Ability to arrange tools and equipment for easy identification					
					65. Ability to ensure that tools and materials needed for practical lessons are made available before commencement of the lesson					
					66. Ability to maintain good housekeeping					
					67. Ability to conduct safety inspection regularly					
					68. Ability to maintain consumable supply inventory					
VHN	**HN**	**MN**	**SN**	**NN**	**Section G: Affective Work Competencies**	**VHP**	**HP**	**MP**	**LP**	**VLP**
					69. Ability to be emotionally stable					
					70. Ability to maintain positive work habits s					
					71. Ability to be punctual to work always					
					72. Ability to be dedicated to duties					
					73. Ability to be independent					
					74. Ability to be careful at work always					
					75. Ability to be loyal to authorities					
					76. Ability to be honest					
					77. Ability to be resourceful					
					78. Ability to maintain high level of etiquette					

					79. Ability to be sociable					
					80. Ability to be creative					
VHN	**HN**	**MN**	**SN**	**NN**	**Section H: Instructional Materials Development and Utilisation Competencies**	**VHP**	**HP**	**MP**	**LP**	**VLP**
					81. Ability to make and use wall charts for teaching					
					82. Ability to make and use flip charts for teaching					
					83. Ability to make and use flannel boards for teaching					
					84. Ability to make and use good pictures for teaching					
					85. Ability to develop simple educational videos for teaching					
					86. Ability to improvise several types of instructional materials					
					87. Ability to develop and use learning objects for teaching					
					88. Ability to make and use three dimensional models for teaching					
					89. Ability to utilize real objects, machines and tools for demonstration					
					90. Ability to make and use two dimensional paper cut outs for teaching					

Appendix E

Reliability of the Instrument

Section A: Pedagogical Competency

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.784	.748	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Pedagogical					
ITEM 1	34.2800	21.293	-.212	.369	.618
ITEM2	33.9600	17.290	.449	.659	.526
ITEM3	33.9600	20.873	-.119	.481	.611
ITEM4	33.9200	17.577	.283	.303	.553
ITEM5	33.8800	15.527	.567	.813	.484
ITEM6	33.9600	16.790	.489	.778	.514
ITEM7	34.1600	19.390	.009	.400	.620
ITEM8	33.6000	18.417	.284	.529	.557
ITEM9	33.2000	18.083	.277	.374	.556
ITEM10	33.6400	13.407	.618	.840	.441
ITEM11	33.7600	17.357	.253	.527	.560
ITEM12	33.8000	19.333	-.011	.553	.633

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means							
Item	3.077	2.640	3.720	1.080	1.409	.078	12
Variances	.798	.240	1.543	1.303	6.431	.167	12

Section B: Classroom Management Competency

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.713	.726	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
CLASSROOM					
ITEM13	30.6000	20.167	.587	.672	.665
ITEM14	31.0800	21.160	.366	.598	.693
ITEM15	30.9200	19.493	.477	.412	.673
ITEM16	31.1600	22.557	.148	.525	.724
ITEM17	30.9200	23.660	.004	.538	.744
ITEM18	30.2000	19.000	.582	.919	.655
ITEM19	30.4800	19.260	.547	.774	.662
ITEM20	30.7600	18.857	.321	.627	.711
ITEM21	30.2400	19.273	.415	.917	.684
ITEM22	30.7200	20.877	.427	.733	.685

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means							
Item	3.412	2.960	3.920	.960	1.324	.108	10
Variances	.876	.510	1.823	1.313	3.575	.148	10

Section C: ICT Competency

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.763	.781	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
ICT					
ITEM23	38.9200	31.910	-.159	.446	.707
ITEM24	38.6400	23.657	.298	.638	.658
ITEM25	37.7200	26.043	.344	.653	.636
ITEM26	38.8000	26.167	.398	.648	.627
ITEM27	38.4400	29.173	.102	.785	.674
ITEM28	37.8800	26.110	.408	.897	.626
ITEM29	38.6000	27.083	.373	.486	.634
ITEM30	38.4400	26.340	.428	.650	.624
ITEM31	38.0400	27.957	.334	.748	.641
ITEM32	38.1200	27.610	.259	.542	.650
ITEM33	37.4800	25.427	.633	.699	.599
ITEM34	38.2800	25.793	.397	.729	.626

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means							
Item	3.480	2.840	4.280	1.440	1.507	.196	12
Variances	1.017	.543	2.693	2.150	4.957	.313	12

Section D: Intrapersonal Competency

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.718	.734	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
INTRAPERSONAL					
ITEM35	31.4800	22.260	.314	.542	.707
ITEM36	31.2000	22.583	.297	.161	.709
ITEM37	30.8000	23.167	.326	.289	.704
ITEM38	30.7600	22.690	.455	.587	.690
ITEM39	31.8000	21.750	.390	.439	.694
ITEM40	30.7600	21.107	.651	.773	.661
ITEM41	30.8800	23.193	.166	.515	.736
ITEM42	31.3600	20.323	.424	.450	.689
ITEM43	31.5600	22.340	.345	.442	.701
ITEM44	31.5200	19.677	.543	.619	.665

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means							
Item	3.468	2.880	3.920	1.040	1.361	.149	10
Variances	.928	.493	1.393	.900	2.824	.092	10

Section E: Interpersonal Competency

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.766	.767	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
INTERPERSONAL					
ITEM 45	38.0800	15.077	.471	.754	.613
ITEM46	37.7600	16.190	.489	.753	.619
ITEM47	37.2000	16.333	.560	.640	.614
ITEM48	37.6400	17.990	.068	.492	.693
ITEM49	37.5600	16.840	.327	.724	.643
ITEM50	37.9600	17.707	.213	.419	.660
ITEM51	38.6000	18.667	.033	.535	.688
ITEM52	37.9200	17.910	.170	.365	.666
ITEM53	37.5600	15.173	.571	.778	.598
ITEM54	37.3600	15.157	.628	.863	.592
ITEM55	37.1200	19.527	-.072	.713	.689
ITEM56	38.0000	15.750	.305	.575	.650

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means							
Item	3.430	2.560	4.040	1.480	1.578	.173	12
Variances	.632	.290	1.140	.850	3.931	.060	12

Section F: Laboratory Management Competency

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.774	.789	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LABMGT					
ITEM57	40.2000	20.917	.097	.370	.688
ITEM58	39.3600	20.407	.502	.669	.647
ITEM59	39.6400	21.573	.025	.334	.696
ITEM60	39.5600	17.257	.722	.838	.590
ITEM61	39.3200	19.060	.450	.831	.635
ITEM62	40.0800	21.410	.076	.533	.686
ITEM63	39.8000	19.917	.221	.851	.669
ITEM64	40.3600	17.073	.469	.777	.623
ITEM65	39.9600	16.207	.552	.744	.603
ITEM66	40.3600	18.990	.279	.739	.661
ITEM67	40.0800	19.743	.274	.451	.660
ITEM68	40.4400	20.257	.251	.611	.663

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means							
Item	3.630	3.120	4.240	1.120	1.359	.153	12
Variances	.715	.167	1.250	1.083	7.500	.092	12

Section G: Affective Work Competency

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.791	.729	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AFFECTIVE					
ITEM69	37.6800	11.143	.068	.178	.498
ITEM70	37.8800	11.527	.017	.489	.503
ITEM71	36.6800	10.893	.127	.278	.484
ITEM72	37.2400	9.773	.302	.537	.434
ITEM73	37.6800	8.893	.357	.685	.407
ITEM74	37.6000	9.333	.462	.695	.391
ITEM75	37.0400	9.623	.460	.457	.401
ITEM76	37.6400	8.573	.358	.523	.403
ITEM77	38.4800	12.927	-.371	.530	.565
ITEM78	38.1600	10.057	.271	.414	.445
ITEM79	38.1600	10.973	.167	.572	.475
ITEM80	38.0800	11.410	-.057	.506	.547

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means							
Item	3.427	2.640	4.440	1.800	1.682	.265	12
Variances	.544	.240	1.093	.853	4.556	.072	12

Section H: Instructional Materials Development and Utilisation Competency

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.772	.745	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
INSTMAT					
ITEM81	31.4800	12.260	.331	.797	.529
ITEM82	32.2400	14.273	-.060	.558	.612
ITEM83	31.9600	11.957	.284	.821	.538
IYEM84	32.5200	9.927	.495	.738	.462
ITEM85	32.1200	9.777	.491	.711	.461
IYEM86	32.5200	11.593	.274	.642	.541
ITEM87	32.2400	11.690	.372	.433	.515
ITEM88	32.6000	12.583	.262	.589	.545
ITEM89	32.2800	15.460	-.278	.609	.645
ITEM90	31.5200	13.177	.377	.344	.540

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means							
Item	3.572	3.120	4.240	1.120	1.359	.155	10
Variances	.702	.167	1.250	1.083	7.500	.119	10

Reliability Statistics for technical teachers competency needs (General)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.790	.761	90

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Pedagogical					
ITEM1	306.4000	225.583	.461	.	.701
ITEM2	306.0800	213.660	.225	.	.685
ITEM3	306.0800	220.160	.088	.	.693
ITEM4	306.0400	220.540	.086	.	.696
ITEM5	306.0000	221.333	.114	.	.698
ITEM6	306.0800	222.577	.177	.	.698
ITEM7	306.2800	209.793	.267	.	.682
ITEM8	305.7200	214.293	.211	.	.686
ITEM9	305.3200	228.810	.434	.	.707
ITEM10	305.7600	215.357	.059	.	.692
ITEM11	305.8800	214.943	.101	.	.689
ITEM12	305.9200	213.077	.135	.	.688
CLASSROOM					
ITEM 13	305.5200	212.093	.309	.	.682
ITEM14	306.0000	208.667	.427	.	.677
ITEM15	305.8400	207.723	.377	.	.677
ITEM16	306.0800	210.827	.308	.	.681
ITEM17	305.8400	213.473	.190	.	.686
ITEM18	305.1200	206.110	.464	.	.674
ITEM19	305.4000	207.583	.407	.	.677
ITEM20	305.6800	201.893	.399	.	.672
ITEM21	305.1600	209.140	.276	.	.681
ITEM22	305.6400	216.907	.069	.	.690
ICT					
ITEM 23	306.2000	214.500	.142	.	.687
ITEM24	305.9200	210.993	.112	.	.691
ITEM25	305.0000	222.917	.155	.	.701
ITEM26	306.0800	218.327	.008	.	.694
ITEM27	305.7200	221.293	.112	.	.698
ITEM28	305.1600	219.140	.036	.	.695
ITEM29	305.8800	218.360	.002	.	.693
ITEM30	305.7200	212.460	.220	.	.684
ITEM31	305.3200	220.810	.106	.	.695
ITEM32	305.4000	209.167	.326	.	.680
ITEM33	304.7600	221.190	.118	.	.696
ITEM34	305.5600	214.423	.115	.	.689

INTRAPERSONAL					
ITEM 35	305.8400	206.557	.400	.	.676
ITEM36	305.5600	212.840	.188	.	.685
ITEM37	305.1600	220.973	.110	.	.696
ITEM38	305.1200	218.110	.021	.	.691
ITEM39	306.1600	207.473	.380	.	.677
ITEM40	305.1200	212.193	.283	.	.683
ITEM41	305.2400	222.440	.139	.	.701
ITEM42	305.7200	206.293	.335	.	.677
ITEM43	305.9200	211.410	.251	.	.683
ITEM44	305.8800	206.777	.347	.	.677
INTERPERSONAL					
ITEM 45	305.9600	212.373	.207	.	.685
ITEM46	305.6400	215.740	.135	.	.688
ITEM47	305.0800	215.577	.172	.	.687
ITEM48	305.5200	220.760	.093	.	.697
ITEM49	305.4400	209.340	.412	.	.678
ITEM50	305.8400	209.140	.460	.	.678
ITEM51	306.4800	213.927	.201	.	.686
ITEM52	305.8000	219.500	.046	.	.693
ITEM53	305.4400	215.173	.134	.	.688
ITEM54	305.2400	213.940	.202	.	.686
ITEM55	305.0000	221.583	.177	.	.695
ITEM56	305.8800	207.777	.329	.	.679
LABMGT	305.6800	214.810	.138	.	.688
ITEM58	304.8400	219.057	.015	.	.691
ITEM59	305.1200	213.527	.204	.	.685
ITEM60	305.0400	217.207	.056	.	.690
ITEM61	304.8000	220.000	.069	.	.694
ITEM62	305.5600	209.007	.461	.	.677
ITEM63	305.2800	225.710	.282	.	.703
ITEM64	305.8400	208.640	.296	.	.680
ITEM65	305.4400	209.757	.248	.	.682
ITEM66	305.8400	210.807	.249	.	.683
ITEM67	305.5600	219.590	.050	.	.694
ITEM68	305.9200	218.327	.009	.	.692
AFFECTIVE					
ITEM 71	305.6000	218.250	.019	.	.691
ITEM70	305.8000	215.333	.224	.	.686
ITEM71	304.6000	216.750	.097	.	.689
ITEM72	305.1600	208.640	.434	.	.677
ITEM73	305.6000	208.917	.331	.	.679
ITEM74	305.5200	213.343	.249	.	.684
ITEM75	304.9600	217.957	.036	.	.691
ITEM76	305.5600	209.673	.273	.	.681
ITEM77	306.4000	220.750	.134	.	.694
ITEM78	306.0800	215.910	.120	.	.688
ITEM79	306.0800	216.077	.169	.	.687
ITEM80	306.0000	219.833	.060	.	.695

INSTMAT					
ITEM 81	304.8000	220.000	.069	.	.694
ITEM82	305.5600	209.007	.461	.	.677
ITEM83	305.2800	225.710	.282	.	.703
IYEM84	305.8400	208.640	.296	.	.680
ITEM85	305.4400	209.757	.248	.	.682
IYEM86	305.8400	210.807	.249	.	.683
ITEM87	305.5600	219.590	.050	.	.694
ITEM88	305.9200	218.327	.009	.	.692
ITEM89	305.6000	218.250	.019	.	.691
ITEM90	304.8400	219.057	.015	.	.691

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.434	2.560	4.440	1.880	1.734	.174	90
ITEM Variances	.772	.167	2.693	2.527	16.160	.146	90

Appendix F

Details of SPSS Output

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Pedagogical				
ITEM1	78	3.1667	.43891	.04970
ITEM2	78	3.0513	.71890	.08140
ITEM3	78	3.1026	.54866	.06212
ITEM4	78	3.1538	.92690	.10495
ITEM5	78	3.2308	.92474	.10471
ITEM6	78	2.5513	.52589	.05954
ITEM7	78	3.0256	1.12786	.12770
ITEM8	78	2.7308	.44643	.05055
ITEM9	78	3.7436	.81282	.09203
ITEM10	78	3.3077	1.16561	.13198
ITEM11	78	3.3077	.94399	.10689
ITEM12	78	3.1282	.99817	.11302
CLASSROOM				
ITEM13	78	3.5513	.63752	.07218
ITEM14	78	3.2436	.74181	.08399
ITEM15	78	3.3718	.86953	.09845
ITEM16	78	3.2179	.83195	.09420
ITEM17	78	3.3205	.76436	.08655
ITEM18	78	2.4744	.55184	.06248

ITEM19	78	3.5513	.78372	.08874
ITEM20	78	2.3077	.49169	.05567
ITEM21	78	2.5513	.69595	.07880
ITEM22	78	3.5000	.75162	.08510
ICT				
ITEM23	78	3.1923	.99424	.11258
ITEM24	78	3.3590	1.45918	.16522
ITEM25	78	4.1282	1.01109	.11448
ITEM26	78	3.4359	1.12342	.12720
ITEM27	78	3.5385	.97624	.11054
ITEM28	78	4.0256	.93939	.10636
ITEM29	78	3.5128	.97692	.11061
ITEM30	78	3.6154	.97008	.10984
ITEM31	78	3.9231	.81813	.09263
ITEM32	78	3.8718	.95834	.10851
ITEM33	78	4.3077	.81077	.09180
ITEM34	78	3.7949	1.06123	.12016
INTRAPERSONAL				
ITEM35	78	3.7051	1.08243	.12256
ITEM36	78	3.7308	.97599	.11051
ITEM37	78	2.5128	.67888	.07687
ITEM38	78	3.9872	.74718	.08460
ITEM39	78	3.1410	1.11337	.12606
ITEM40	78	2.5513	.71437	.08089
ITEM41	78	3.7436	1.01208	.11460
ITEM42	78	3.6026	1.12053	.12687

ITEM43	78	3.4744	1.00291	.11356
ITEM44	78	3.4103	1.01208	.11460
INTERPERSONAL				
ITEM45	78	3.3333	.86290	.09770
ITEM46	78	3.5385	.63843	.07229
ITEM47	78	2.2949	.68583	.07765
ITEM48	78	3.6667	.80043	.09063
ITEM49	78	2.7051	.83912	.09501
ITEM50	78	2.5513	.63752	.07218
ITEM51	78	3.2692	.59594	.06748
ITEM52	78	3.3718	.66663	.07548
ITEM53	78	3.6923	.68958	.07808
ITEM54	78	3.9359	.70875	.08025
ITEM55	78	4.0128	.56966	.06450
ITEM56	78	3.4103	.99917	.11313
LABMGT				
ITEM57	78	3.6026	.88772	.10051
ITEM58	78	3.9231	.81813	.09263
ITEM59	78	3.7436	.78021	.08834
ITEM60	78	4.1795	.71611	.08108
ITEM61	78	2.3590	.77249	.08747
ITEM62	78	3.5000	.87905	.09953
ITEM63	78	2.3077	.46453	.05260
ITEM64	78	2.4103	.54501	.06171
ITEM65	78	3.7949	1.07340	.12154
ITEM66	78	3.4103	1.12164	.12700

ITEM67	78	3.6667	.90692	.10269
ITEM68	78	3.4359	1.03935	.11768
AFFECTIVE				
ITEM69	78	3.7179	.85124	.09638
ITEM70	78	2.5641	.49908	.05651
ITEM71	78	2.2051	.49304	.05583
ITEM72	78	2.4231	.49725	.05630
ITEM73	78	3.3205	.79762	.09031
ITEM74	78	3.4615	.63843	.07229
ITEM75	78	2.2179	.41552	.04705
ITEM76	78	2.2821	.53202	.06024
ITEM77	78	2.7949	.65185	.07381
ITEM78	78	2.5385	.50175	.05681
ITEM79	78	2.6282	.51242	.05802
ITEM80	78	3.1795	.94996	.10756
INSTMAT				
ITEM81	78	2.9615	.85951	.09732
ITEM82	78	2.6026	.65147	.07376
ITEM83	78	3.6667	.73266	.08296
ITEM84	78	2.4359	.67593	.07653
ITEM85	78	4.0128	.56966	.06450
ITEM86	78	3.4103	.99917	.11313
ITEM87	78	2.3462	.55425	.06276
ITEM88	78	2.2692	.67753	.07671
ITEM89	78	3.7436	.78021	.08834
ITEM90	78	2.1667	.40825	.04623

GRANDMEANPEDA	78	3.1250	.39993	.04528
GRANDMEANCLASS	78	3.1090	.30714	.03478
GRANDMEANICT	78	3.7254	.68759	.07785
GRANDMEANINTRA	78	3.3859	.49379	.05591
GRANDMEANINTER	78	3.3152	.30527	.03457
GRANDMEANLAB	78	3.3611	.35525	.04022
GRANGMEANAFFECT	78	2.7778	.18642	.02111
GRANDMEANINST	78	2.9615	.19489	.02207

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Pedagogical					
ITEM1	Female	17	3.3529	.60634	.14706
	Male	61	3.1148	.36961	.04732
ITEM2	Female	17	3.1765	.63593	.15424
	Male	61	3.0164	.74144	.09493
ITEM3	Female	17	3.2941	.46967	.11391
	Male	61	3.0492	.56054	.07177
ITEM4	Female	17	3.2941	.91956	.22303
	Male	61	3.1148	.93271	.11942
ITEM5	Female	17	3.4706	.79982	.19398
	Male	61	3.1639	.95185	.12187
ITEM6	Female	17	2.4706	.62426	.15141
	Male	61	2.5738	.49863	.06384

ITEM7	Female	17	3.3529	1.11474	.27036
	Male	61	2.9344	1.12352	.14385
ITEM8	Female	17	2.5882	.50730	.12304
	Male	61	2.7705	.42401	.05429
ITEM9	Female	17	3.6471	.86177	.20901
	Male	61	3.7705	.80402	.10294
ITEM10	Female	17	3.1765	1.07444	.26059
	Male	61	3.3443	1.19562	.15308
ITEM11	Female	17	3.4706	.71743	.17400
	Male	61	3.2623	.99836	.12783
ITEM12	Female	17	3.0000	.70711	.17150
	Male	61	3.1639	1.06740	.13667
CLASSROOM					
ITEM13	Female	17	3.6471	.60634	.14706
	Male	61	3.5246	.64824	.08300
ITEM14	Female	17	3.5294	.51450	.12478
	Male	61	3.1639	.77847	.09967
ITEM15	Female	17	3.6471	.78591	.19061
	Male	61	3.2951	.88212	.11294
ITEM16	Female	17	3.5882	.61835	.14997
	Male	61	3.1148	.85826	.10989
ITEM17	Female	17	3.7059	.68599	.16638
	Male	61	3.2131	.75531	.09671
ITEM18	Female	17	2.5882	.61835	.14997
	Male	61	2.4426	.53306	.06825

ITEM19	Female	17	3.4118	.50730	.12304
	Male	61	3.5902	.84414	.10808
ITEM20	Female	17	2.3529	.49259	.11947
	Male	61	2.2951	.49478	.06335
ITEM21	Female	17	2.8824	.78121	.18947
	Male	61	2.4590	.64740	.08289
ITEM22	Female	17	3.7059	.77174	.18718
	Male	61	3.4426	.74217	.09503
ICT					
ITEM23	Female	17	3.9412	.89935	.21812
	Male	61	2.9836	.92181	.11803
ITEM24	Female	17	3.7059	.98518	.23894
	Male	61	3.2623	1.55886	.19959
ITEM25	Female	17	4.3529	.86177	.20901
	Male	61	4.0656	1.04672	.13402
ITEM26	Female	17	4.2353	.90342	.21911
	Male	61	3.2131	1.08189	.13852
ITEM27	Female	17	3.8235	.95101	.23065
	Male	61	3.4590	.97594	.12496
ITEM28	Female	17	4.2353	.90342	.21911
	Male	61	3.9672	.94811	.12139
ITEM29	Female	17	4.1176	.92752	.22496
	Male	61	3.3443	.92889	.11893
ITEM30	Female	17	4.0000	.93541	.22687
	Male	61	3.5082	.95957	.12286

ITEM31	Female	17	4.1765	.88284	.21412
	Male	61	3.8525	.79238	.10145
ITEM32	Female	17	4.1765	.88284	.21412
	Male	61	3.7869	.96807	.12395
ITEM33	Female	17	4.2353	.90342	.21911
	Male	61	4.3279	.78996	.10114
ITEM34	Female	17	4.2353	.90342	.21911
	Male	61	3.6721	1.07581	.13774
INTRAPERSONAL					
ITEM35	Female	17	4.5294	.51450	.12478
	Male	61	3.4754	1.08944	.13949
ITEM36	Female	17	4.1176	.85749	.20797
	Male	61	3.6230	.98597	.12624
ITEM37	Female	17	2.2353	.43724	.10605
	Male	61	2.5902	.71594	.09167
ITEM38	Female	17	4.1176	.78121	.18947
	Male	61	3.9508	.73996	.09474
ITEM39	Female	17	3.5882	1.22774	.29777
	Male	61	3.0164	1.05660	.13528
ITEM40	Female	17	2.6471	.78591	.19061
	Male	61	2.5246	.69777	.08934
ITEM41	Female	17	3.2941	1.15999	.28134
	Male	61	3.8689	.93942	.12028
ITEM42	Female	17	4.1176	.78121	.18947
	Male	61	3.4590	1.16295	.14890
ITEM43	Female	17	4.1176	.85749	.20797
	Male	61	3.2951	.97201	.12445

ITEM44	Female	17	3.8235	.63593	.15424
	Male	61	3.2951	1.06996	.13699
INTERPERSONAL					
ITEM45	Female	17	3.8824	.48507	.11765
	Male	61	3.1803	.88522	.11334
ITEM46	Female	17	3.8824	.48507	.11765
	Male	61	3.4426	.64613	.08273
ITEM47	Female	17	2.0588	.24254	.05882
	Male	61	2.3607	.75350	.09648
ITEM48	Female	17	4.0588	.42875	.10399
	Male	61	3.5574	.84705	.10845
ITEM49	Female	17	3.2353	.97014	.23529
	Male	61	2.5574	.74217	.09503
ITEM50	Female	17	2.5294	.71743	.17400
	Male	61	2.5574	.61980	.07936
ITEM51	Female	17	3.5882	.50730	.12304
	Male	61	3.1803	.59184	.07578
ITEM52	Female	17	3.6471	.60634	.14706
	Male	61	3.2951	.66694	.08539
ITEM53	Female	17	4.0000	.35355	.08575
	Male	61	3.6066	.73663	.09432
ITEM54	Female	17	4.2353	.56230	.13638
	Male	61	3.8525	.72655	.09302
ITEM55	Female	17	3.8824	.69663	.16896
	Male	61	4.0492	.52998	.06786

ITEM56	Female	17	3.8235	.72761	.17647
	Male	61	3.2951	1.03834	.13295
LABMGT					
ITEM57	Female	17	4.0588	.82694	.20056
	Male	61	3.4754	.86807	.11115
ITEM58	Female	17	3.5294	1.12459	.27275
	Male	61	4.0328	.68233	.08736
ITEM59	Female	17	3.5294	.71743	.17400
	Male	61	3.8033	.79204	.10141
ITEM60	Female	17	4.4706	.62426	.15141
	Male	61	4.0984	.72353	.09264
ITEM61	Female	17	2.0000	.00000	.00000
	Male	61	2.4590	.84801	.10858
ITEM62	Female	17	3.5294	1.12459	.27275
	Male	61	3.4918	.80876	.10355
ITEM63	Female	17	2.1176	.33211	.08055
	Male	61	2.3607	.48418	.06199
ITEM64	Female	17	2.2941	.46967	.11391
	Male	61	2.4426	.56346	.07214
ITEM65	Female	17	4.1176	.92752	.22496
	Male	61	3.7049	1.10067	.14093
ITEM66	Female	17	3.6471	1.27187	.30847
	Male	61	3.3443	1.07835	.13807
ITEM67	Female	17	3.9412	.96635	.23437
	Male	61	3.5902	.88274	.11302

ITEM68	Female	17	4.0000	1.22474	.29704
	Male	61	3.2787	.93329	.11950
AFFECTIVE					
ITEM68	Female	17	4.2353	.90342	.21911
	Male	61	3.5738	.78441	.10043
ITEM70	Female	17	2.1765	.39295	.09531
	Male	61	2.6721	.47333	.06060
ITEM71	Female	17	2.3529	.49259	.11947
	Male	61	2.1639	.48923	.06264
ITEM72	Female	17	2.6471	.49259	.11947
	Male	61	2.3607	.48418	.06199
ITEM73	Female	17	3.2353	.56230	.13638
	Male	61	3.3443	.85411	.10936
ITEM74	Female	17	3.2941	.46967	.11391
	Male	61	3.5082	.67387	.08628
ITEM75	Female	17	2.5294	.51450	.12478
	Male	61	2.1311	.34036	.04358
ITEM76	Female	17	2.2353	.43724	.10605
	Male	61	2.2951	.55810	.07146
ITEM77	Female	17	3.0000	.79057	.19174
	Male	61	2.7377	.60282	.07718
ITEM78	Female	17	2.7647	.43724	.10605
	Male	61	2.4754	.50354	.06447
ITEM79	Female	17	2.7059	.46967	.11391
	Male	61	2.6066	.52532	.06726

ITEM80	Female	17	3.4118	1.00367	.24343
	Male	61	3.1148	.93271	.11942
INSTMAT					
ITEM81	Female	17	3.5882	.50730	.12304
	Male	61	2.7869	.85858	.10993
ITEM82	Female	17	2.8824	.78121	.18947
	Male	61	2.5246	.59460	.07613
ITEM83	Female	17	4.0000	.35355	.08575
	Male	61	3.5738	.78441	.10043
ITEM84	Female	17	2.1765	.52859	.12820
	Male	61	2.5082	.69816	.08939
ITEM85	Female	17	3.8824	.69663	.16896
	Male	61	4.0492	.52998	.06786
ITEM86	Female	17	3.8235	.72761	.17647
	Male	61	3.2951	1.03834	.13295
ITEM87	Female	17	2.3529	.70189	.17023
	Male	61	2.3443	.51268	.06564
ITEM88	Female	17	2.1176	.48507	.11765
	Male	61	2.3115	.71974	.09215
ITEM89	Female	17	3.5294	.71743	.17400
	Male	61	3.8033	.79204	.10141
ITEM90	Female	17	2.1176	.48507	.11765
	Male	61	2.1803	.38765	.04963
GRANDMEANPEDA					
	Female	17	3.1912	.49456	.11995
	Male	61	3.1066	.37210	.04764

GRANDMEANCLASS					
	Female	17	3.3059	.31319	.07596
	Male	61	3.0541	.28436	.03641
GRANDMEANICT					
	Female	17	4.1029	.80662	.19563
	Male	61	3.6202	.61774	.07909
GRANDMEANINTRA					
	Female	17	3.6588	.49125	.11914
	Male	61	3.3098	.47071	.06027
GRANDMEANINTER					
	Female	17	3.5686	.19373	.04699
	Male	61	3.2445	.29379	.03762
GRANDMEANLAB					
	Female	17	3.4363	.39805	.09654
	Male	61	3.3402	.34302	.04392
GRANGMEANAFFECT					
	Female	17	2.8824	.19333	.04689
	Male	61	2.7486	.17513	.02242
GRANDMEANINST					
	Female	17	3.0471	.15459	.03749
	Male	61	2.9377	.19930	.02552

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
Pedagogical	Equal variances assumed	11.835	.001	2.018	76	.047	.23819	.11804	.00309	.47329
	Equal variances not assumed			1.542	19.430	.139	.23819	.15449	-.08467	.56105
ITEM2	Equal variances assumed	.084	.773	.810	76	.420	.16008	.19760	.23349	.55364
	Equal variances not assumed			.884	29.297	.384	.16008	.18111	.21017	.53033
ITEM3	Equal variances assumed	.430	.514	1.646	76	.104	.24494	.14883	.05149	.54136

	Equal variances not assumed			1.819	29.965	.079	.24494	.13464	.03004	.51991
ITEM4	Equal variances assumed	.008	.927	.703	76	.484	.17936	.25505	.32861	.68733
	Equal variances not assumed			.709	25.922	.485	.17936	.25299	-.34073	.69946
ITEM5	Equal variances assumed	.067	.797	1.213	76	.229	.30665	.25284	.19693	.81024
	Equal variances not assumed			1.339	29.882	.191	.30665	.22909	.16129	.77460
ITEM6	Equal variances assumed	3.117	.082	.713	76	.478	.10318	.14469	.39136	.18499
	Equal variances not assumed			.628	22.010	.536	.10318	.16432	.44394	.23758
ITEM7	Equal variances assumed	.002	.962	1.360	76	.178	.41851	.30763	.19418	1.03121

	Equal variances not assumed			1.367	25.790	.184	.41851	.30625	.21124	1.04827
ITEM8	Equal variances assumed	5.259	.025	-1.501	76	.138	.18226	.12145	.42415	.05964
	Equal variances not assumed			-1.355	22.608	.189	-.18226	.13448	.46072	.09621
ITEM9	Equal variances assumed	.285	.595	.551	76	.583	-.12343	.22394	.56944	.32257
	Equal variances not assumed			.530	24.323	.601	.12343	.23299	.60396	.35709
ITEM10	Equal variances assumed	2.514	.117	.522	76	.603	.16779	.32120	.80751	.47193
	Equal variances not assumed			.555	28.058	.583	.16779	.30223	.78682	.45123
ITEM11	Equal variances assumed	1.925	.169	.803	76	.425	.20829	.25949	.30854	.72512

	Equal variances not assumed			.965	35.196	.341	.20829	.21591	.22994	.64652
ITEM12	Equal variances assumed	9.751	.003	.596	76	.553	.16393	.27491	.71146	.38359
	Equal variances not assumed			.748	38.621	.459	-.16393	.21929	.60764	.27977
CLASSROOM	Equal variances assumed	.504	.480	.698	76	.487	.12247	.17543	.22693	.47186
	Equal variances not assumed			.725	27.084	.475	.12247	.16886	.22396	.46890
ITEM14	Equal variances assumed	2.581	.112	1.823	76	.072	.36548	.20044	.03374	.76470
	Equal variances not assumed			2.288	38.726	.028	.36548	.15970	.04237	.68858
ITEM15	Equal variances assumed	.359	.551	1.488	76	.141	.35198	.23662	.11929	.82324

	Equal variances not assumed			1.589	28.278	.123	.35198	.22156	.10167	.80562
ITEM16	Equal variances assumed	.932	.337	2.122	76	.037	.47348	.22315	.02904	.91792
	Equal variances not assumed			2.547	35.095	.015	.47348	.18592	.09608	.85089
ITEM17	Equal variances assumed	.008	.927	2.424	76	.018	.49277	.20329	.08787	.89766
	Equal variances not assumed			2.561	27.792	.016	.49277	.19244	.09843	.88710
ITEM18	Equal variances assumed	.951	.332	.962	76	.339	.14561	.15142	.15597	.44719
	Equal variances not assumed			.884	23.050	.386	.14561	.16477	.19520	.48643
ITEM19	Equal variances assumed	9.058	.004	.828	76	.410	.17840	.21538	.60737	.25057

	Equal variances not assumed			-1.089	43.338	.282	.17840	.16377	.50859	.15180
ITEM20	Equal variances assumed	.245	.622	.427	76	.671	.05786	.13557	.21215	.32787
	Equal variances not assumed			.428	25.720	.672	.05786	.13523	.22025	.33597
ITEM21	Equal variances assumed	.313	.577	2.277	76	.026	.42334	.18588	.05312	.79355
	Equal variances not assumed			2.047	22.491	.053	.42334	.20681	.00502	.85169
ITEM22	Equal variances assumed	.145	.704	1.282	76	.204	.26326	.20528	.14559	.67211
	Equal variances not assumed			1.254	24.870	.221	.26326	.20992	.16918	.69570
ICT	Equal variances assumed	.604	.440	3.807	76	.000	.95757	.25153	.45661	1.45853

	Equal variances not assumed			3.861	26.143	.001	.95757	.24801	.44792	1.46722
ITEM24	Equal variances assumed	3.754	.056	1.110	76	.270	.44359	.39959	-.35226	1.23944
	Equal variances not assumed			1.425	40.818	.162	.44359	.31134	.18525	1.07243
ITEM25	Equal variances assumed	.834	.364	1.037	76	.303	.28737	.27716	.26465	.83939
	Equal variances not assumed			1.157	30.487	.256	.28737	.24829	.21936	.79410
ITEM26	Equal variances assumed	.225	.636	3.560	76	.001	1.02218	.28711	.45036	1.59400
	Equal variances not assumed			3.943	30.065	.000	1.02218	.25923	.49281	1.55154
ITEM27	Equal variances assumed	.089	.767	1.369	76	.175	.36451	.26623	.16574	.89476

	Equal variances not assumed			1.390	26.169	.176	.36451	.26233	.17454	.90356
ITEM28	Equal variances assumed	.440	.509	1.041	76	.301	.26808	.25749	.24476	.78092
	Equal variances not assumed			1.070	26.660	.294	.26808	.25049	.24619	.78236
ITEM29	Equal variances assumed	.351	.555	3.037	76	.003	.77338	.25468	.26615	1.28062
	Equal variances not assumed			3.039	25.660	.005	.77338	.25446	.24999	1.29677
ITEM30	Equal variances assumed	.002	.966	1.879	76	.064	.49180	.26179	.02959	1.01320
	Equal variances not assumed			1.906	26.161	.068	.49180	.25800	.03837	1.02198
ITEM31	Equal variances assumed	.881	.351	1.454	76	.150	.32401	.22277	.11967	.76769

	Equal variances not assumed			1.367	23.672	.184	.32401	.23694	.16537	.81339
ITEM32	Equal variances assumed	.000	.983	1.494	76	.139	.38959	.26075	.12975	.90892
	Equal variances not assumed			1.575	27.690	.127	.38959	.24741	.11746	.89663
ITEM33	Equal variances assumed	1.223	.272	.414	76	.680	-.09257	.22356	.53784	.35269
	Equal variances not assumed			.384	23.263	.705	.09257	.24133	.59149	.40634
ITEM34	Equal variances assumed	1.764	.188	1.971	76	.052	.56316	.28575	.00595	1.13228
	Equal variances not assumed			2.176	29.900	.038	.56316	.25881	.03452	1.09180
INTRAPERSONAL	Equal variances assumed	13.976	.000	3.857	76	.000	1.05400	.27326	.50976	1.59825

	Equal variances not assumed			5.632	57.166	.000	1.05400	.18716	.67925	1.42876
ITEM36	Equal variances assumed	.999	.321	1.878	76	.064	.49470	.26338	.02988	1.01927
	Equal variances not assumed			2.033	28.916	.051	.49470	.24329	.00295	.99234
ITEM37	Equal variances assumed	11.643	.001	-1.940	76	.056	.35487	.18293	.71921	.00947
	Equal variances not assumed			-2.532	42.514	.015	-.35487	.14017	.63765	.07209
ITEM38	Equal variances assumed	.714	.401	.812	76	.419	.16683	.20537	.24221	.57586
	Equal variances not assumed			.788	24.591	.439	.16683	.21184	.26983	.60349
ITEM39	Equal variances assumed	3.240	.076	1.904	76	.061	.57184	.30027	.02620	1.16988

	Equal variances not assumed			1.748	23.025	.094	.57184	.32706	.10470	1.24838
ITEM40	Equal variances assumed	.568	.453	.623	76	.535	.12247	.19670	.26930	.51424
	Equal variances not assumed			.582	23.500	.566	.12247	.21051	.31249	.55743
ITEM41	Equal variances assumed	.505	.480	-2.117	76	.038	.57473	.27150	-1.11548	.03399
	Equal variances not assumed			-1.878	22.186	.074	.57473	.30597	-1.20898	.05951
ITEM42	Equal variances assumed	10.422	.002	2.196	76	.031	.65863	.29996	.06121	1.25605
	Equal variances not assumed			2.733	38.001	.009	.65863	.24098	.17079	1.14647
ITEM43	Equal variances assumed	.440	.509	3.160	76	.002	.82257	.26028	.30416	1.34097

	Equal variances not assumed			3.394	28.535	.002	.82257	.24237	.32652	1.31861
ITEM44	Equal variances assumed	10.756	.002	1.938	76	.056	.52845	.27274	-.01475	1.07165
	Equal variances not assumed			2.562	43.915	.014	.52845	.20629	.11267	.94422
INTERPERSONAL	Equal variances assumed	8.038	.006	3.131	76	.002	.70203	.22418	.25553	1.14852
	Equal variances not assumed			4.297	48.371	.000	.70203	.16336	.37363	1.03042
ITEM46	Equal variances assumed	9.772	.003	2.604	76	.011	.43973	.16887	.10340	.77606
	Equal variances not assumed			3.057	33.548	.004	.43973	.14382	.14730	.73216
ITEM47	Equal variances assumed	15.500	.000	-1.622	76	.109	-.30183	.18613	.67255	.06889

	Equal variances not assumed			-2.671	74.363	.009	-.30183	.11299	.52696	.07670
ITEM48	Equal variances assumed	18.393	.000	2.350	76	.021	.50145	.21335	.07653	.92636
	Equal variances not assumed			3.337	53.013	.002	.50145	.15025	.20008	.80281
ITEM49	Equal variances assumed	7.432	.008	3.107	76	.003	.67792	.21820	.24333	1.11251
	Equal variances not assumed			2.672	21.492	.014	.67792	.25376	.15093	1.20490
ITEM50	Equal variances assumed	.627	.431	.159	76	.874	-.02797	.17596	.37842	.32249
	Equal variances not assumed			.146	23.082	.885	-.02797	.19124	.42351	.36758
ITEM51	Equal variances assumed	.091	.763	2.586	76	.012	.40791	.15772	.09378	.72203

	Equal variances not assumed			2.823	29.315	.008	.40791	.14450	.11251	.70331
ITEM52	Equal variances assumed	.121	.729	1.960	76	.054	.35198	.17954	.00561	.70957
	Equal variances not assumed			2.070	27.767	.048	.35198	.17005	.00351	.70045
ITEM53	Equal variances assumed	25.734	.000	2.127	76	.037	.39344	.18494	.02511	.76177
	Equal variances not assumed			3.087	56.197	.003	.39344	.12747	.13811	.64877
ITEM54	Equal variances assumed	1.547	.217	2.008	76	.048	.38284	.19066	.00310	.76257
	Equal variances not assumed			2.319	32.478	.027	.38284	.16508	.04677	.71890
ITEM55	Equal variances assumed	3.077	.083	-1.069	76	.289	.16683	.15609	.47770	.14405

	Equal variances not assumed			-.916	21.429	.370	.16683	.18207	.54501	.21136
ITEM56	Equal variances assumed	9.136	.003	1.964	76	.053	.52845	.26908	.00748	1.06437
	Equal variances not assumed			2.392	36.205	.022	.52845	.22094	.08044	.97645
LABMGT	Equal variances assumed	2.239	.139	2.475	76	2.475	.58341	.23575	.11389	1.05294
	Equal variances not assumed			2.544	26.666	.017	.58341	.22930	.11265	1.05417
ITEM58	Equal variances assumed	15.182	.000	-2.305	76	.024	.50338	.21834	.93824	.06851
	Equal variances not assumed			-1.758	19.397	.095	.50338	.28640	-1.10199	.09524
ITEM59	Equal variances assumed	.168	.683	-1.285	76	.203	-.27387	.21308	.69825	.15051

	Equal variances not assumed			-1.360	27.858	.185	.27387	.20140	.68650	.13877
ITEM60	Equal variances assumed	.000	.992	1.928	76	.058	.37223	.19302	.01221	.75666
	Equal variances not assumed			2.097	29.133	.045	.37223	.17750	.00927	.73518
ITEM61	Equal variances assumed	34.807	.000	-2.221	76	.029	.45902	.20665	.87059	.04744
	Equal variances not assumed			-4.228	60.000	.000	.45902	.10858	.67620	.24183
ITEM62	Equal variances assumed	5.763	.019	.155	76	.877	.03761	.24263	.44563	.52084
	Equal variances not assumed			.129	20.829	.899	.03761	.29175	-.56942	.64464
ITEM63	Equal variances assumed	30.578	.000	-1.941	76	.056	.24301	.12517	.49230	.00629

	Equal variances not assumed			-2.391	37.098	.022	.24301	.10164	.44894	.03708
ITEM64	Equal variances assumed	3.874	.053	-.993	76	.324	.14851	.14949	.44623	.14922
	Equal variances not assumed			-1.101	30.118	.279	.14851	.13483	.42383	.12682
ITEM65	Equal variances assumed	1.261	.265	1.411	76	.162	.41273	.29251	.16986	.99531
	Equal variances not assumed			1.555	29.799	.131	.41273	.26545	.12955	.95501
ITEM66	Equal variances assumed	2.896	.093	.984	76	.328	.30280	.30768	.31000	.91560
	Equal variances not assumed			.896	22.809	.380	.30280	.33796	.39666	1.00225
ITEM67	Equal variances assumed	.867	.355	1.421	76	.160	.35101	.24710	.14113	.84316

	Equal variances not assumed			1.349	23.961	.190	.35101	.26020	.18606	.88809
ITEM68	Equal variances assumed	4.586	.035	2.626	76	.010	.72131	.27473	.17414	1.26848
	Equal variances not assumed			2.253	21.448	.035	.72131	.32018	.05631	1.38631
AFFECTIVE	Equal variances assumed	1.406	.239	2.974	76	.004	.66152	.22240	.21857	1.10447
	Equal variances not assumed			2.745	23.157	.012	.66152	.24103	.16309	1.15995
ITEM70	Equal variances assumed	8.662	.004	-3.950	76	.000	.49566	.12550	.74561	.24571
	Equal variances not assumed			-4.389	30.237	.000	.49566	.11294	.72624	.26508
ITEM71	Equal variances assumed	2.931	.091	1.407	76	.164	.18901	.13437	.07861	.45663

	Equal variances not assumed			1.401	25.492	.173	.18901	.13490	.08855	.46656
ITEM72	Equal variances assumed	.014	.907	2.149	76	.035	.28640	.13328	.02096	.55185
	Equal variances not assumed			2.128	25.287	.043	.28640	.13460	.00935	.56345
ITEM73	Equal variances assumed	6.198	.015	.496	76	.622	.10897	.21983	.54680	.32887
	Equal variances not assumed			.623	38.903	.537	.10897	.17481	.46258	.24464
ITEM74	Equal variances assumed	5.697	.019	-1.227	76	.224	.21408	.17452	.56167	.13351
	Equal variances not assumed			-1.498	36.427	.143	.21408	.14290	.50377	.07561
ITEM75	Equal variances assumed	19.451	.000	3.785	76	.000	.39826	.10522	.18870	.60782

	Equal variances not assumed			3.013	20.061	.007	.39826	.13217	.12261	.67392
ITEM76	Equal variances assumed	.982	.325	-.408	76	.685	.05979	.14671	.35198	.23241
	Equal variances not assumed			.468	32.066	.643	-.05979	.12787	.32024	.20066
ITEM77	Equal variances assumed	.013	.911	1.478	76	.143	.26230	.17741	.09105	.61565
	Equal variances not assumed			1.269	21.455	.218	.26230	.20669	.16699	.69158
ITEM78	Equal variances assumed	21.812	.000	2.151	76	.035	.28930	.13448	.02146	.55713
	Equal variances not assumed			2.331	28.959	.027	.28930	.12411	.03546	.54314
ITEM79	Equal variances assumed	3.267	.075	.704	76	.483	.09932	.14100	.18149	.38014

	Equal variances not assumed			.751	28.188	.459	.09932	.13229	.17157	.37022
ITEM80	Equal variances assumed	.568	.453	1.142	76	.257	.29701	.26002	.22086	.81489
	Equal variances not assumed			1.095	24.254	.284	.29701	.27114	.26229	.85631
INSTMAT	Equal variances assumed	10.839	.002	3.663	76	.000	.80135	.21874	.36568	1.23702
	Equal variances not assumed			4.857	44.225	.000	.80135	.16499	.46887	1.13383
ITEM82	Equal variances assumed	.898	.346	2.043	76	.044	.35776	.17510	.00903	.70650
	Equal variances not assumed			1.752	21.434	.094	.35776	.20419	.06636	.78189
ITEM83	Equal variances assumed	26.421	.000	2.172	76	.033	.42623	.19626	.03535	.81711

	Equal variances not assumed			3.228	59.932	.002	.42623	.13206	.16206	.69039
ITEM84	Equal variances assumed	10.587	.002	-1.816	76	.073	.33173	.18267	.69555	.03210
	Equal variances not assumed			-2.122	33.244	.041	.33173	.15629	.64961	.01384
ITEM85	Equal variances assumed	3.077	.083	-1.069	76	.289	.16683	.15609	.47770	.14405
	Equal variances not assumed			.916	21.429	.370	.16683	.18207	.54501	.21136
ITEM86	Equal variances assumed	9.136	.003	1.964	76	.053	.52845	.26908	-.00748	1.06437
	Equal variances not assumed			2.392	36.205	.022	.52845	.22094	.08044	.97645
ITEM87	Equal variances assumed	1.063	.306	.057	76	.955	.00868	.15300	.29605	.31341

	Equal variances not assumed			.048	20.988	.963	.00868	.18245	.37076	.38812
ITEM88	Equal variances assumed	5.185	.026	-1.044	76	.300	-.19383	.18571	-.56370	.17604
	Equal variances not assumed			-1.297	37.857	.202	.19383	.14944	.49640	.10874
ITEM89	Equal variances assumed	.168	.683	-1.285	76	.203	.27387	.21308	.69825	.15051
	Equal variances not assumed			-1.360	27.858	.185	-.27387	.20140	-.68650	.13877
ITEM90	Equal variances assumed	.840	.362	-.557	76	.579	-.06268	.11247	.28668	.16132
	Equal variances not assumed			.491	22.016	.628	.06268	.12769	.32748	.20212
GRANDMEANPEDA	Equal variances assumed	4.284	.042	.769	76	.444	.08462	.10998	.13442	.30366

	Equal variances not assumed			.656	21.305	.519	.08462	.12906	.18355	.35279
GRANDMEANCLASS	Equal variances assumed	.738	.393	3.158	76	.002	.25178	.07972	.09301	.41055
	Equal variances not assumed			2.989	23.860	.006	.25178	.08423	.07788	.42569
GRANDMEANICT	Equal variances assumed	3.859	.053	2.659	76	.010	.48272	.18156	.12112	.84433
	Equal variances not assumed			2.288	21.505	.032	.48272	.21102	.04451	.92093
GRANDMEANINTRA	Equal variances assumed	.703	.405	2.678	76	.009	.34899	.13030	.08947	.60851
	Equal variances not assumed			2.614	24.803	.015	.34899	.13352	.07389	.62409
GRANDMEANINTER	Equal variances assumed	3.079	.083	4.285	76	.000	.32409	.07563	.17346	.47472

	Equal variances not assumed			5.385	38.829	.000	.32409	.06019	.20233	.44585
GRANDMEANLAB	Equal variances assumed	.591	.445	.986	76	.327	.09611	.09745	.09797	.29019
	Equal variances not assumed			.906	23.045	.374	.09611	.10606	.12327	.31549
GRANGMEANAFFECT	Equal variances assumed	.405	.527	2.722	76	.008	.13372	.04912	.03588	.23156
	Equal variances not assumed			2.573	23.822	.017	.13372	.05198	.02640	.24103
GRANDMEANINST	Equal variances assumed	1.947	.167	2.090	76	.040	.10935	.05232	.00515	.21355
	Equal variances not assumed			2.411	32.403	.022	.10935	.04535	.01702	.20169