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CAPACITY-BUILDING NEEDS IN VOCATIONAL AND TECHNICAL EDUCATION TRAINING PROGRAMMES THROUGH CURRICULUM MODIFICATION FOR SPECIAL NEEDS LEARNERS

Dr. Genevieve Aglazor*

Abstract

This study sought to identify (the capacity building Needs of vocational and Technical Education teachers curriculum modification for special needs learners. Survey research design was adopted, with three research questions to guide the study. Eighty-one university lecturers from four institutions participated in the study. The instrument for data collection was a 31 curriculum modification skill-items questionnaire (CMSIQ) which was developed by the researcher with two components of "Needed" and performance" with four response options each. The copies of the instruments retrieved were analyzed using mean and Improvement Needs Index (INI) to answer the three research questions. The findings of the study revealed that Vocational and Technical teachers needed capacity-building in 28 out of the 31 curriculum modification skills for teaching special needs learners. Finally, it was recommended that the identified modification skills to enable them establish, select and modify existing materials to improve academic performance of their students.

Background of the Study

The effectiveness of all educational systems depends critically on the quality of teaching and learning in the classroom, workshops, laboratories and other spaces in which the education takes place. Right from the point of policy formulation, some policy makers have argue that professional training of teachers is unimportant, while others are of the strong opinion that teachers should be constantly trained and retrained to meet up to current challenges. Shaw (2005) stated that when considerable concern is not given to the-.need for teacher training, the facts of the matter suggest a different picture. He further stressed that professional training which is the skills and knowledge attained for both personal development and

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career achievement is very important in the teaching profession because the beneficiary who are the students will indirectly impact their gained knowledge to the economy of the nation. However, the question therein is; how can this teacher's professional training be achieved so that effective teaching and learning of vocational special needs learners be attained? The means of achieving this is through professional training of the vocational teacher in curriculum modification.

Vocational and Technical teacher according to Kok, Jernigan, and Hull (2008), is that person who have been professionally train in pedagogy and practical skills who in turn impart it on his students towards acquiring employability skills and this generate decent work and income through wage earning jobs or self-employment. The special needs learners have the legal right to enter vocational programmes in order to develop marketable skills. These learners have the same needs and desires as anyone else to develop occupational skills, enter the labour force, and become contributing members of society. In view of this, vocational educators are working cooperatively with other educational personnel and professionals from the community to mainstream special needs learners into regular programmes, whenever possible and providencessary support Service to help them succeed (Sarkees, and Scott, 2006). This includes access to vocational programmes. Specific modifications may have to be made to vocational facilities and curriculum for this population to have access to them.

The term special needs learners according to Phelps (2008) are those individuals who encounter or are likely to encounter difficulty in educational or employment settings because of a disability, economic or academic disadvantage, different linguistic or cultural background or outdated job skills, and who require (a) individually prescribed and unique teaching strategies; (b) supportive services that vary in type and extent depending on individual needs; and (c) additional resources from society for their acceptance. Dunn and Dunn (2004) stressed that for this category of learners to fit into the mainstream and benefit effectively, the curriculum must be modified to accommodate them.

Curriculum modification means tailoring all the experiences and activities in pursuit of occupational preparation under the direction of a school to meet the unique needs of the individual learner. Considerations in modifying the vocational curriculum to meet the specific needs of individual learners include establishing realistic goals, matching learning styles with leaching styles, establishing readability levels for materials used in the programme, selecting appropriate instructional materials, and modifying existing materials (Stern-Otazo, 2011). Vocational teachers are not expected to lower programme standards to successfully integrate special needs learners in their classes. If these learners are to be employable when they complete the programme, they must meet certain proficiency and employability standards.

Rather than lowering programme standards for these learners, vocational teachers need to undergo capacity building in order to exercise flexibility in planning and implementing instructions (Sarkees, & Scott 2006).

Olaitan, Alaribe and Nwobu (2009) see capacity building as efforts geared towards improving the level of knowledge, skills, and attitude possessed by individuals for proficiency in a given task or job. Garriga (2009) in Nkado (2014) affirms that capacitybuilding is much more than training and includes Human Resource Development (HRD), the process of equipping the individual, for instance the vocational teachers, with understanding, skills, access to information, knowledge and training that enable them perform their teaching function effectively through curriculum modification. UNESCO (2006) observed that the first step in capacity-building approach is to focus on the identification, of the core competencies that the organization or the individuals need to have in order to be able to fulfill the assigned tasks. In this study therefore, the first approach was the identification of these core competences to be possessed by the vocational teachers in curriculum modification for special needs learners; these constituted the instruments utilized for data collection for the study. How curriculum modification by vocational teachers can influence the integration of special needs learners into the mainstream towards achieving the set goal without lowering the standard is the problem of this study.

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Specifically, the study intend to determine the capacity-building needs of vocational and technical Education Teachers in:

- (a) Establishing Realistic goals/favourable environment in a vocational programme.
- (b) Selecting appropriate instructional materials
- (c) Modifying existing instructional materials to meet the learners needs.

Methodology

Three research questions were used to guide the study. The study adopted Survey Research design. Nworgu (2006) stated that survey design is aim at collecting data on, and describing in a systematic manner, the characteristics, features or facts about a given population.

This design was considered appropriate because it solicited for information from the respondents on the capacity-building needs of Vocational Teachers in Curriculum modification for special needs learners. The study was conducted in the School of Vocational and Technical Education, Federal College of Education Pankshin Plateau State. The Departments that make up the school are: Technical Education, Agricultural science. Business education. Fine and Applied Arts, and Home Economics.

The population for the study was 81 lecturers from the five Departments that make up theschool. Since the population was small the sampling technique was of the convenience type(manageable) A 31 modification skill-item questionnaire was developed from literature reviewed, and

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used to collect data from the respondents. Each skill item has two columns of "Needed" and "performance" response options. The "Needed" column have 4 response options of "Highly Needed", 'Averagely Needed", 'Slightly Needed', and Not Needed". While the performance column have 4 response options of 'High Performance', 'Average performance', low performance' and 'No Performance'. The instrument was trial tested on 23 lecturers in different institutions who were not part of the main study. Cronbach Alpha reliability coefficient for internal consistency yielded 0.87 for the instrument.

Copies of the questionnaire were administered to the respondents with the help of two research assistants. A total number of 81 copies of the instruments were collected representing 100% return. The data collected were analyzed using weighted mean and Improvement Need Index (INI) (Olaitan and Ndomi, 2001). To answer the research questions, Real Limit of numbers was utilized for decision making under the needed category. The 4-point response options were assigned: 3.50-4.00 as Highly Needed; 2.50-3.49 Averagely Needed; 1.50-2:49, Slightly Needed and 1.00-1.49 Not Needed. An item with a minimum value of 1.50 and above was regarded as 'Needed', while any item within a weighted mean value of less than 1.50 was regarded as 'Not Needed'.

In the performance category, real limit of numbers was also utilized for decision making on a 4-point response options of 3.50-4.00 High Performance, 2.50-3.49, Average performance; 1.50-2.49, Low performance and 1.00-1.49, No Performance. Similarly any item with a weighted mean of 1.50 and above was regarded as performance ranging between low and very high, while any item with a mean less than 1.50 was regarded as No Performance'.

In order to determine the capacity-Building Needs of Vocational and Technical Teachers in Curriculum modification for special needs learners, the Improvement Need Index (INI) wasused thus: fl) the weighted mean of each skill item under the Needed Category (Xn) minus the (X) X_{n} - X_{r} performance gap (PG).

Where the difference was zero. $(X_n - X = 0)$, it therefore mean that there is no need for * capacity building on that item because the level at which the item was needed was equal to thelevel of performance of the vocational teachers. In the case where the difference was (-1). it shows that capacity building was needed on the item because the level at which the item was needed was greater than the performance level of the vocational teachers. But if the difference is negative (-), it indicates that capacity building is not needed.

Results

The results from this study were obtained from the three research questions that guided the study.

Research Question 1: What are the capacity- building needs of Vocational and Technical teachers in Establishing Realistic goals/ favourable environment in a vocational programme?

Table 1

The need gap analysis of vocational and technical teachers in establishing Realistic goals/favourable environment in vocational programme N = 81

S/N	Item Statement	X _n	X _p PG=	$= X_n - X_p$	Remark
1	Establishes the content of the materials in relation	3.54	3.51	0.03	CBN
	to the instructional programme				
2	Current content are with recent technology	2.98	2.89	0.09	CBN
3	Included technical terms are highlighted repeatedly	3.65	3.61	0.04	CBN
4	Technical terms are defined and used in the material	3.35	3.32	0.03	CBN
5	Explain level of complexity and rate of speed at	3.10	2.90	0.20	CBN
	which information is presented in appropriate				
6	Concepts are clearly and simply presented and	3.50	3.45	0,05	CBN
	easy to Understand				
7	Adequate space provided for learners to provide	3.40	3.19	0.21	CBN
	written Responses				
8	Performance objectives are presented	3.68	3.55	0.13	CBN
9	Spend reasonable amount of time to prepare,	3.56	3.51	0.04	CBN
	administer and evaluate learner progress on the				
	material				

CBN- Capacity Building Needed, PG= Performance gap

The Data on table 1 revealed that all the nine skills items had their performance gap value ranging from 0.03 to 0.21 and are all positive. Therefore, it mean that the vocational and technical teachers needed capacity building an the Nine items in establishing realistic goals/favourable environment in vocational programme.

Research Question 2: What are the Capacity-building needs of Vocational and Technicalteachers in selecting appropriate instructional materials?

Table 2

The need gap analysis of Vocational and Technical Teachers in selecting appropriate instructional materials N=81

mstru	uctional materials				IN-01
S/N	Item Statement	Х	XPG=	Х-Х	Remark
10	Properly select materials that reinforces concepts covered in the classroom instruction	3.48	3.46	0.02	CBN
11	Determine the reading level of the material to match the reading ability of a particular learner or group.	3.58	3.53	0.05	CBN
12	Appropriately provide students activities and nook sheets.	3.06	2.93	0.13	CBN

13	Ensure adequate work space is available in the				
	classroom or laboratory so that materials can				
	be used properly	3.35	3.13	0.23	CBN
14	Ability to purchase parts of the materials				
	separately from the overall package	3.47	2.83	0.64	CBN
15	Ensure that review questions and				
	answer keys are provided	2.67	2.63	0.04	CBN
16	Ensure provision of hand on learning activities	3.45	3.21	0.22	CBN
17	Adequately provide teacher's handbook or manual	3.01	3.48	-0.47	CBN

CBN- Capacity- Building Needed, PG = Performance gap CBNN-Capacity- Building Not Needed

Data presented on table 2 indicated that seven out of the eight skill items had their performance gap value ranged from 0.02 to 0.64 and were positive values. This shows that vocational and Technical teachers needed capacity-building on the seven items in selecting appropriate instructional materials. The table also revealed that one skill item (NO 17) have negative value gap of -0.47 which shows that vocational and technical teachers does not need capacity building.

Research Question 3: What are the capacity-building needs of vocational and technicalteachers in modifying existing instructional materials to meet the learners needs?

Table 3

The need gap analysis of vocational and technical teachers in modifying existing instructional materials to meet the learners needs. N=81

S/n	Item Statement	XX.PI	$F = X_n X_n$, Ren	nark
18	Modify instructions in all direction so as to be clearly understood	3.26	2.60	0.66	CBN
19	Ensure that important ideas are highlighted	3.54	3.62	-0.08	CBN
20	Informations should be properly organized,				
	clear, and easy to follow	3.67	3.64	0.03	CBN
21	Ensure that a glossary of terms is presented	3.06	4.42	-0.36	CBN
22	Insist on breaking instruction into				
	reinforcing small steps	3.61	3.52	0.08	CBN
23	Arrange materials in a self spaced manner	3.06	2.71	0.35	CBN
24	Ensure that materials provide a variety of				
	periodic self-checks to reinforce learners	3.45	2.92	0.53	CBN
25	Modify materials to provide for follow-up activities				
	to reinforce concepts	3.35	3.30	0.05	CBN

26	Modified materials should create room for				
	individualized, small group, &/ or large group	3.25	3.22	0.03	CBN
	instruction				
27	Modify equipment should be made available				
	and accessible	3.58	3.56	0.02	CBN
28	Modify materials to allow for frequent usage to				
	justify the modification	3.02	2.65	0.37	CBN
29	Ensuring that materials are well modified to				
	withstand repeated usage	3.78	3.65	0.13	CBN
30	Modified materials should not be difficult or				
	expensive to reorder	3.48	3.46	0.02	CBN
31	Modified material should be presentable as it is or				
	can easily be adapted	3.44	3.42	0.02	CBN

CBN= Capacity- Building Needed, PG = Performance gap CBNN-Capacity- Building Not Needed

The Data on table 3 revealed that 12 out 14 skill items had their performance gap value ranging from 0.02 to 0.66 and are positive. The positive value indicated that the vocational and technical teachers needed capacity-building in the twelve items in modifying existinginstructional materials to meet the learners needs. It can be seen from the table also that two (2) items had negative performance gap values (No. 19^-0.08, and No. 21 = -0.36) indicating that the teachers do not need capacity building in the two items.

Discussion of Results

The result in table revealed that vocational and technical teachers needed capacity building in all the nine skill items in establishing realistic goals/favourable environment in a vocational programme. They include: Relating the content of the materials to the instructional programme, content should be in line with recent technology, technical terms highlighted, define technical terms in the material, appropriate information presented, concepts presented clearly and simple, adequate space for learners to provide written responses. Performance objectives presented, and reasonable amount of time required to prepare administer and evaluate learners progress.

Table 2 and 3 revealed that the vocational and Technical teachers needed capacity building in nineteen out of twenty two skill items in selecting and modification of instructional materials to meet the learners needs, while three skill items (No. 17, 19 & 21) did not need capacity building.

The findings of this study is in agreement with the findings of Hoellien, Feitchtner, and O' Brien (2009) in a study of the "effect of modify instructional materials on special needs interest". Their findings revealed that modified instructional materials stimulates learners interest, motivate individuals to learn, and help them achieve realistic objectives. The findings of this study was also in agreement with Kay (1980) who stated that many vocational teachers do not have an opportunity to order materials that have been developed withspecial needs learners in mind. Therefore modification of existing materials in necessary byteachers who posses the skills.

Conclusion

Using a variety of different types of instructional materials is often critical to the success of special needs learners enrolled in vocational education programmes. Instructional materials should stimulate learner interest, motivate individuals to learn, and help them achieve realistic objectives. Modifying the curriculum is often critical to the success of special needs learners enrolled in vocational programmes. These materials require careful analysis before being selected or revised.

The study therefore recommends that the identified modification skill items in the study be utilized to upgrade the skills of vocational and technical teachers through capacity- building to equip them in establishing, selecting and modifying existing materials towards meeting a realistic goals of the special needs learners. When this skills are properly formulated and implemented it will definitely promote best practices in Nigerian Education.

References

- Dunn, R., and Dunn, K. (2004). *Teaching students through their individual learning styles: A practical approach*. Reston, VA: Reston Publishing Co.
- Hoellein, T., Feitchtner, S., and O'Brien, T. (2009). Pennsylvania Vocational Administrators' guide book. Indiana, P.A: Indiana university.

- Jernigan, K. and HulLF. (2008). Entry skills needed for Special needs Students in Vocational programmes. The Vocational Quarterly, 31(2), 149-153
- Kay, C. (1980). Improving the Curriculum. Columbia, M.O: University of Missouri Columbia, Project Missouri LINC.
- Nkado. N.C. (2014). Capacity-Building Needs of Principals for Curbing indiscipline among (Secondary School Students in Borno state. *International Journal of Educational Research* University of Nigeria, Nsukka. 13 (1).
- Nworgu, B.C., (2006). *Educational Research: Basic Issues and Methodology*. Ibadan: Wisdom Publishers Ltd.
- Olaitan, S.O., Alaribe, M.O; and Nwobu. V.I. (2009). *Capacity Building Needs of Teachers of Agriculture for Effective Teaching in Basic Schools in Abia state*. A paper presented at the Annual Conference of Faculty of Education, University of Nigeria, Nsukka.
- Olaitan, S.O., and Ndomi, B.M. (2001). *Vocametrics;* Cape Publishers International Ltd. Onitsha-Nigeria.
- Phelps, L.A. (2008). Issues and options for Special Population, Vocational Education, 58 (2).
- Sarkees M.D., and Scott, J.L. (2006). *Vocational Special Needs*. American Technical Publishers Inc.
- Shaw, S. R. (2005). The Devolution of interest in slow learners! Can we continue to ignore. NASP Communique,8(3)1-2 retrieved from http://www.naspolino.org/publication cq212 slowlearner.htmltern- Otazo (2011)
- UNESCO (2006). Capacity building guide book for planning education in emergencies and reconstruction: International Institute for Educational Planning (HEP), www.unesco. org/iiep.

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SOCIAL STUDIES TEACHERS' PERCEPTION OF TELEVISION VIEWING AND ACADEMIC ATTAINMENT OF LOWER BASIC PUPILS IN CALABAR SOUTH, CROSS RIVER STATE, NIGERIA

Cornelius-Ukpepi, B. U. (Ph.D)* Odey, Clarence Odey**

Abstract

The effect of television viewing has been perceived differently in different quarters as having certain effects on pupils' academic attainment. The researchers in the present study sought to investigate Social Studies teachers' perception of the effects of television viewing on the academic attainment of lower basic pupils in Calabar South, Cross River State, Nigeria. To achieve the aim of this study, two null hypotheses were formulated to serve as direction. The survey research design was adopted for the study. Simple random sampling technique was employed to select 100 respondents from a population of 326 teachers. The instrument for data collection was a four-point Likert scale type questionnaire titled "Teachers' Perception of the Effects of TV-viewing on Academic Attainment of Lower Basic Pupils Questionnaire (TPETAALBPO). The instrument had two sections (A & B) to seek information on the demographic characteristics of the teachers and teachers' perception of the effects of TV viewing on academic attainment of their pupils, respectively. Data collected were analysed using frequency distribution and percentages as well Chi Square Analysis at 0.05 level of significance. The result of the analyses indicated that teachers don't have a negative perception of the effect of TV viewing on pupils' academic perception. It was also found that teachers' perception on this variable is not dependent on sex. In this regards, it was strongly recommended that teachers should be encouraged to use TV or videos as a Social Studies medium of instruction in the lower basic education level.

Key words: Social Studies, Teachers' perception, Television viewing, Pupils' academic attainment, Lower basic education.

Introduction/Statement of the problem

Television is the electronic carpet that transports millions of persons each day to

faraway places. It is the twentieth century creations of the technological revolution that has been transforming much of the

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world. Television, although relatively a new medium, has already made its impression on the world civilization very strikingly. It has been aptly mentioned that television bounces signals of space satellites and uses oceanic cables to transmit live telecast to and from people all over the world. Television can represent the world in no time. Today, one can watch television via the internet, by means of mobile phones, and with the help of little pocket TV sets. It is everywhere and for everyone. Today, it is very common in every country for a household to have at least one television. In fact, it is so common that it is difficult to imagine a household without TV. Ever since TV took its strike, it has remained the most influential medium of communication (Noor-Ul-Amin, 2013).

It can be considered a credible source of information. The reasons being that the full colour, action packed and real actors filmed make TV seem to be real to the audience. The influence of TV on teenagers, adolescents and youth is widespread. Children and adolescents have been found to be the most devoted and faithful viewers of television. whether the programmes are designed for them or not (Ofili, 2012). Ekanem (2007) established that television has considerably reduced the time spent for other activities. Television has had a large influence on people's attitudes and Behaviour (Lund &Blaedon, 2003). Moses (2008) revealed that moderate amount of television viewing was found to be beneficial for reading, and that the content of programmes viewed by children matters. Miller (2007) revealed that higher frequency television viewing is associated with attention problems and hyper-activity in pre-school children. According to Greeson

(1991), television has been found to reflect and possibly shape the attitudes, values and behaviour of young people. TV viewing is associated with more behavioural outcomes and poor performances among children and teenagers (Van Evra, 2004; Johnson, Cohen, Kasen, Brook, 2007; Nsofor, 2001). Viewers with heavy consumption rates of television confuse real life with dramatized life on TV, and television values seem closer to real-life values (O'Guinn&Shrum, 1997). In 1989, Condry found that the frequency of watching television reduced with the increase in levels of education and income.

According to Hornik (1978), television is a good medium for demonstrations since thecamera can look in a microscope, peer into corners and give close-ups of things which could never be so closely or accurately observed in a normal classroom situation. Studies report that continuous watching of television amounts to low performance in school subjects (Caldas &Bankston,1999). In a study with high scholars, researchers found that viewing educational television programmes as pre-schoolers was associated with higher grades, more reading, less aggression and more value placed on academics when those children reached high school (National Institute on Media and the Family, 2002). Television influences social behaviour not only by teaching new behaviour but also by contributing to children's definition of what constitutes appropriate and inappropriate behaviour(Robert, 1987).

Educational Department of the Cooperation (EDC, 2004) observed that one of television's most obvious characteristics is its visual aspect.Humans intuitively grasp the power of images to convey meaning, as can be seen in the old adage that values a picture at a thousand times the value of a word. Television, of course, offers information in multiple forms: not just images, but motion, sounds, and, at times, text. Research has shown that multiple tracks of audio and visual information convey powerful learning benefits, as each source complements the other. Viewing is an active process, perhaps best thought of as an interactive experience between viewer and medium. In addition to responding to what they observe from the screen, viewers bring their own experiences and expectations to their viewing. Hence, studies show that what students think about television affects their ability to learn from it. In the context of casual effortless viewing, learning tends to be shallow and short-lived, but when viewing is more purposeful, then deeper and more sophisticated learning can occur. As another researcher has noted "...because of the ubiquitous presence of television in children's daily lives, the medium has become a major socialiser and educator of children" (Calvert, 2001).

Merringoff(2003) in EDC (2004) stated that research in the past two decades has proven what we intuitively know: our brains deal with images differently than print. Words are processed in the neocortex, where the higher thinking capability of the brain resides. Pictures, however, are handled in the limbic system, rapidly, and trigger instinct, emotion, and impulse (Bergsma, 2002). Because brains are programmed to rememberexperiences that have an emotional component, television has a powerful ability to relay experience through the emotions evoked by images Research has shown that seeing is remembering, too. People generally remember about twice as much when they see and hear something, than when they only see or hear it. Furthermore, a positive relationship has been found between childhood viewing of educational television and cognitive performance at both pre-schooler and college levels (Calvert, 2001).

The problem of this study lies on pupils' academic attainment in lower basic education in Calabar South, Cross River State, Nigeria. Pupils at this academic stage are expected to pass an entry or qualification examination to progress to the secondary school level. However, over the years, especially since the introduction of the Universal Basic Education in Cross River State and Nigeria as whole, there has been a visible trend of low performance of pupils in the First School Leaving Certificate (FSLC) Examinations. The challenge is that some of the students are pushed based on some trivial considerations to the next level in the academic ladder, and unfortunately, they end up disappointing the system. Despite all motivational measures put in place by the Cross River State government to stem this ugly tide, the trend has not been forestalled. In 2009, the state government renovated virtually all public schools to carter for the UBE programme. The government provided good classroom blocks, desks and many other academic necessities all to no avail. In other to find the true cause of this problem, the current researchers assumed that subject teachers would be in a better position to tell if viewing television would be a factor.Regrettably, in Calabar South, not much is being done about incorporating TV or video as an instructional

medium in the school system. It is based on this backdrop that, teachers of Social Studies in the lower basic level of education have their own peculiar view of the effect of TV viewing on the educational attainment of their pupils. Teachers' perception of the effects of TV viewing on pupils' academic attainment could be negative or positive, which could help give direction to where the cause of the problem lies. Moreover, their perception could be a product of their sex since a large majority of teachers in Cross River State are females. What do teachers think about the use of TV viewing with respect to pupils' academic attainment? In this study, the researchers centred on the investigation of Social Studies teachers' perception of the effect of TV viewing on pupils'academic attainment in selected primary schools in Calabar South of Cross River State, Nigeria.

Theoretical framework

Social learning theory by Albert Bandura (1977)

Social learning theory was first developed by Albert Bandura in 1977. Bandura took a middle stand between operant conditioning and classical conditioning theories. His postulation is that people learn through observing, imitating, or modelling other people's behaviour, attitudes and outcomes of such behaviours. "Most human behaviour is learned observationally through modelling: from observing others, one forms an idea of how new behaviours are performed, and on later occasions this coded information serves as a guide for action" (Bandura, 1977:14). Social learning theory explains human behaviour in terms of continuous reciprocal interaction between cognitive, behavioural, and environmental influences. The theory views learning as cognitive process, which takes place in a social context. In contrast with the two theories alluded to, social learning theory maintains that learning can take place even when there is no motor reproduction or direct reinforcement. Furthermore, learning does not only take place by observation of behaviour but also by observation of rewards and punishment. This is called vicarious reinforcement. By this, any behaviour that is rewarded or reinforced is sustained whereas constant punishment of behaviour leads to its termination.

In relation to this study, this theory is relevant because teachers' perception of the effect of television viewing on students' academic attainment would largely depend on their perception of the usefulness of TV generally. The teachers are aware of the value of video in teaching and learning process; visual materials enhance retention. Therefore, this theory explains that teachers would perceive the effect of TV viewing on students as they would perceive the importance of visual materials on students' learning.

Purpose of the study

The aim of this study was to examine:

- 1. the perception of Social Studies teachers on the effect of TV viewing on the academicattainment of lower basic pupils in Calabar South, Cross River State, Nigeria.
- 2. whether teachers' perception of the effect of TV viewing is dependent on their gender.

Research questions

- 1. What perceptions do Social Studies teachers have about the effect of TV viewing on pupils' academic attainment in lower basic education in Calabar South of Cross River State, Nigeria?
- 2. Is teachers' perception of the effect of TV viewing dependent on their gender?

Hypotheses

- 1. Social Studies teachers do not have a negative perception about the effects of TV viewing on pupils' academic attainment in lower basic education.
- 2. Teachers' perception of the effects of TV viewing on pupils'academic attainment does not significantly depend on their sex

Methodology

The study was conducted in Calabar South Local Government Area of Cross River State, Nigeria. The survey research design was adopted for the study. The population of the study is made up of all the Social Studies teachers in lower basic schools (public schools) in the study area. According to the Cross River State Universal Basic Education Board (2017), the total number of teachers in the lower basic level was three hundred and twenty-six (326) in Calabar South alone, out of which males were 31 while females were 295. The simple random sampling technique was used in the selection of one hundred (100) teachers which form the sample size. This accounts for 30 percent of the population. The research instrument is a four-point Likert type scale questionnaire with 10 items. The questionnaire, entitled "Teachers' Perception of the Effects of TV-viewing on Academic Attainment of Lower Basic Pupils Questionnaire (TPETAALBPQ) is made up of two sections (A & B) to seek information on the demographic characteristics of the teachers and teachers' perception of the effects of TV viewing on academic attainment of their pupils, respectively. Data collected were analysed using frequency distribution and percentages as well Chi Square Analysis.

Results

Table 1

Demographic characteristics of the respondents (N = 100).

Variables	Frequency	Percentage (%)
Sex:		
Male	25	25
Female	75	75
Total	100	100
Age:		
20-30 years	45	45
31-40 years	31	31
41-50 years	24	24
Above 50 years	20	20
Total	100	100
Qualification:		
NCE/OND	58	58
B.ED/HND	37	37
M.SC	5	5
Total	100	100
Teaching experience:		
1- 10 years	33	33
11-20 years	30	30
2 1-30 years	27	27
Above 30 years	20	20
Total	100	100

Source: Field survey, 2017.

Table 1 indicates that while 25 representing 25% of the 100 respondents were males, 75 or 75% were females. Also, 45% of the respondents were within the age bracket of 20-30 years, 31 were 31-40 years. Those who were between 41 and 50 years and above 50 years were 24 and 20 respectively. The table also reveals that a vast majority of the respondents were teaching with NCE/OND (58%). Only 5% had a master's degree while 37% were bachelor's degree or HND holders. Lastly, the table shows that majorityof the respondents were teachers of 1-10 years' experience (33), 11-20 years (30), 21-30 years (27) and 31 years and above (20).

Table 2

Chi-square analysis of teachers' perception of the effects of TV-viewing on pupils' academic attainment (100)

S/N	Items	SA	А	D	SD	Total
1	TV viewing enhances retention	40(24.9)	7(15.1)	38(29.1)	15(30.9)	100
2	TV distracts pupils' attention	22	33	30	15	100
3	TV viewing is not necessary for social studies pupils'	15	25	40	20	100
4	All social studies topic should be in video form for pupils to watch at their leisure time	39	41	12	8	100
5.	Pupils should be allowed to watch TV regularly	30	20	33	17	100
6.	Pupils who watch TV often are smarter than those who do not	25	20	35	20	100
7.	TV viewing widens pupils 'mental horizon	22	33	30	15	100
8.	Pupils who watch TV are on track to academicattainment	16	26	44	14	100
9.	TV viewing does not in any way influence pupils' academic attainment	10	20	45	25	100
10.	The teaching and learning of social studies at the basic education level will be greatly improved with the use of TV/video	30	35	25	10	100
	Total	249	291	309	151	1000

Source: Authors' computation, 2017

	SA	А	D	SD		
FO	24.9	29.1	30.9	15.1		
FE	25	25	25	25		
X ² cal =	=∑(Fo -	-Fe)				
Fe = 5	.98					
DF = (C - 1)(R - 1) = (4 - 1)(10 - 1) = 3 X 9 = 27						
$\alpha = 0.05$						
X^2 crit = 40.11						

Table 2 is a representation of the perception of lower basic teachers of Social Studies in Calabar South. According to the table, testing the hypothesis with Chi-square (X^2) analysis at 0.05 level of significance and 27 degrees of freedom, calculated X^2 of 5.98 is less than the critical X^2 of 40.11. Consequent upon this, the null hypothesis was not retained: Social studies teachers do not have a negative perception about the effects of TV viewing on pupils' academic attainment in lower basic education.

Table 3

Chi-square analysis of gender and teachers' perception of the effects of TV-viewing on pupils' academic attainment (100)

Sex	Opinion					X^2
	SA	А	D	D		
Male	10(8.75)	5(6.25)	6(6.5)	4(3.5)	25	·
Female	25(26.26)	20(18,75)	20(19.5)	10(10.5)	75	1.00*
Total	35	25	26	14	100	

*significant at 0.05, df=3, X^2 crit=7.81

Table 3 reveals that the calculated X^2 value (1.00) is significantly less than the critical X^2 (7.81) tested at 0.05 level of significance with 3 degrees of freedom. This result indicates that the null hypothesis was retained. Therefore teachers' perception about the effects of TV viewing on pupils' academic attainment does not significantly depend on their gender.

Discussion

TV viewing and Teachers' perception

Teachers are of the opinion that TV viewing impacts significantly on students' academic attainment. This is what accounts for the use of TV and other media in the teaching and learning of social studies in public schools as well as private schools. This lends credence to Stipp's (2003) report that ever since the filmstrip, non-fiction and documentary programmes have been widely used in American public schools; most teachers use documentaries or other nonfiction materials as "enrichment"- to enhance their coverage of subject areas, particularly language arts, social studies, history, science and geography. Eyovwunu and Akarue (2014) are of the view that simply using media in the classroom does not mean that teachers are helping the development of student's media literacy skills. When teachers use television programmes to convey specific message content, this strategy can be highly effective in capturing student attention, motivating and informing students. However, such practices rarely develop critical analysis, reasoning or communication skills, unless those behaviours are explicitly modelled. Notwithstanding, social studies is an affective-based discipline, thus requires every medium that can foster expression of feeling.

The multiple intelligences theory suggests that an individual's capacity for learning is influenced by the manner in which the subject matter is presented. Marshall (2002) points out that traditional textbooks tend to take a linguistic approach to learning. However, television's, multiple modes can portray content through a variety of approaches, e.g., linguistic, aesthetic, logical, or narrational, thus more effectively matching viewers' various intelligence preferences (Houston & Wright, 1996). These "multiple entry points" into the content are especially valuable in a formal educational setting, as they offer greater accommodation to the multiple intelligences of a diverse group of students.

Gender and teachers' perception of the effect of TV viewing on students' academic attainment

The Gender of the social studies teacher has nothing to do with how they see TV viewing, in relation to pupils' academic attainment in lower basic education. What matters, in fact, is the mode of presentation of the technology. This position is in consonance with NwagbaraandNwammuo(2013). They quoted Sivin-Kachala (1998), who reviewed 219 research studies in America from 1990-1997 to assess the effect of technology of television, and computers on learning and achievements across all learning domains and all ages of learners. He reported the following consistent patterns:

- a) Students in technology environments experienced positive effects on achievements in all major subject areas (social studies inclusive),
- b) Students in technology rich environment showed increased regular and special needs.
- c) Student attitudes towards learning and their own self-concept improved consistency when computers and television sets were used for instruction.
- d) The level of effectiveness of instructional technologies is influenced by the specific population, software design, the teacher's and the level of student's access to the technology.

Corroborating this view, Saunder and Goddard (2002) said the media plays a significant role in forming and influencing people attitudes and behaviour.

Conclusion

Based on the finding of this study, it was concluded that teachers have a positive perception about the effect of TV viewing on pupils' academic attainment in lower basic education. More so, their perception is not dependent on their gender. Accordingly, with reference to EDC (2004), it is further posited here that educational television:

- i) Reinforces reading and lecture material.
- ii) Aids in the development of a common base of knowledge amongstudents
- iii) Enhances student comprehension and discussion.
- iv) Provides greater accommodation of diverse learning styles.

- v) Increases student motivation and enthusiasm.
- vi) Promotes teacher effectiveness

Recommendations

In the light of the foregoing, there is no gain saying that TV viewing as an instructional strategy is highly recommendable. Therefore, in recommending the use of TV or videos in the teaching of Social Studies, teachers can help pupils in the lower basic level of education achieve academic attainment by:

- i) Planning ahead to consider instructional goals
- ii) Preparing by previewing the programme
- iii) Determining the setting and length of the video
- iv) Setting clear expectations for students
- v) Encouraging student participation through; setting the contextbefore, viewing, pausing during the programme to ask key questionsand flag priority topics.
- vi) Promoting reflection through postviewing discussion and assignments
- vii) Connecting post-viewing activities to hands-on or real-worldexperiences

References

- Bandura, A. (1977). Social Learning Theory. New York: General Learning Press.
- Caldas, S. J. & Bankston, C. (1999). Black and white TV: Race, television viewingand academic achievement. *Sociological Spectrum*, 19 (1): 39-62.
- Calvert, S.,Kotler, J., Kuhl, A. &Riboli, M. (2001).Impact of the children'stelevision act on children's learning. Greensboro: NC, SmithRichardson Foundation.

- Cross River State Universal Basic Education Board (2016).
- Education Department of the Corporation (EDC, 2004). Television goes to School: The Impact of Video on Student Learning in Formal Education. Washington, DC: Centre for Children and Technology
- Eyovwunu, D. & Akarue, O. B (2014). Teachers' perceptions on the uses and non- educational uses (misuses) of media resources in secondary schools academic achievement in Warri metropolis of Delta State, Nigeria *Sky Journal of Educational Research 2(8), 65 - 71*
- Ekanem, J. E. (2007). Development and Utilization of Instructional Graphics for the Teaching and Learning of TextileTechnology in Nigerian Universities (Unpublished Doctoral Thesis), University of Uyo, Uyo
- Greeson, L. E. (1991). Recognition and rating of television music videos: Age, gender, and sociocultural affects. J. Applied Soc. Psychol. 21(2): 1908-1920.
- Hornik, R. C. (1978) "Television access and the slowing of cognitive growth".*AmericanEdu. Res. J.* 15(1), 1-15.
- Huston Aletha C, Wright John C (1996). Television and socialization of young children.Tuning into young viewers: Social science perspectives on television (Pp. 37-60). Sage Publications.
- Johnson, J. G, P Cohen, S Kasen& J S Brook (2007). 'Extensive Television Viewing and the Development of Attention and Learning Difficulties during Adolescence', Archives of Paediatrics & Adolescent Medicine, 1(1), 480-486.
- Lund, S. & Blaedon, L. (2003). Sex and the media: The impact of television habits on sexual Perception. J. Undergraduate Res, 6(1): 1-6.

- Marshall, J.M. (2002). Learning with technology:Evidence that technology can, and does, support learning. White paper prepared for Cable in theClassroom.
- Masterman, L. (1985). *Teaching the media*. London: Routledge.
- Meringoff, L..K.., Vibbert, M.M., Char, C.A., Fernie, D.E, Banker, G.S., &Gardner, H. (2003). How is children's learning from television distinctive?Exploiting the medium methodologically.In J.Bryant & D.R.Anderson, (Eds.).Children's understanding of television: Research onattention and comprehension. New York: Academic Press.
- Miller (2007). Extensive Television Viewing and the Development of Attention and Learning Difficulties during Adolescence. *ArchPaediatric Adolescence Med;* 16(1): 480-486.
- Moses, A. M. (2008). Impact of viewing on young children's literacydevelopment..*J. Early Childhood Literacy*, 8(1):67-102.
- National Institute on Media and the Family (2002).Television's effect onreading and academic achievement.RetrievedFebruary 23, 2018 fromhttp://www.mediafamily.org/facts/factsjveffect.shtml.
- Noor-Ul-Amin, S. (2013). Impact of television watching on academicachievement of adolescents with special reference to theirsocioeconomic status. *Standard Journal* of Education and Essay 1(1) 14-20
- Nsofor, C. C (2001) Cultural Impediments on women in STM Education. Science Teachers Association of Nigeria conference proceedings. 20-25

- Nwagbara, G. U. & Nwammuo, A. N. (2013). Instructional TelevisionProgrammes and Academic Performance of Senior Secondary SchoolStudents in Anambra State, Nigeria. *An International MultidisciplinaryJournal.*, *Ethiopia*, 7(29): 329-349.
- Ofili, G. O. (2003). The effect of video tape recording on The academicachievement of secondary school biology students in Niger StateUnpublished Master Thesis. Minna: Federal University of Technology, Minna.
- O'Guinn, T. C. &Shrum, L. J. (1997). The role of television in the construction of consumer reality. *Consumer Res.* 2(3):278-294
- Robert, P. H., &Suzanne, P. (1987). "Television Influence on Social reality", intelevision and behaviour: Ten Years of Scientific Progress andImplications for the Eighties, Ed. National Institute of Mental Health, vol. 2 Rockville, US National Institute of Mental Health, Pp 224-47.
- Saunders, B. J.&Goddard, C. (2002).Child abuse prevention Issues, Number 16Winter.
- Sivin-Kachala, J. (1998). Report on the effectiveness of technology in schools, 1990-1997. Washington, DC: Software Publishers Association.
- Stipp, H. (2003). How children can learn from television. *Journal of AppliedDevelopmental Psychology*, 24(3), 363-365.

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TECHNO-PEDAGOGICAL SKILLS AND CREATIVITY OF STUDENT TEACHERS AT SECONDARY LEVEL

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Abstract

Technology has become an integral part of our life and teaching learning patterns of 21st century. Teachers are the central forces in tapping the learning opportunities created by the technology. Hence an assessment of the relationship between Techno Pedagogical skills and Creativity especially of the Student Teachers at Secondary Level is of greater relevance, since they are the teachers of the future generations of students. This paper discusses the importance of developing Techno-pedagogical skills and Creativity in Teacher Education. Survey method was used for the study. The study was conducted on a random sample of 1022 Student Teachers at Secondary Level. Questionnaire on Techno Pedagogical skills and Passi Test of Creativity was used for the study. The study reveals that there is a significant relationship between Techno-pedagogical skills and Creativity of Student Teachers at Secondary Level.

Introduction

Today's education system is facing a paradigm shift as influenced and shaped by information communication technologies, digital technologies and their application in the education system. Though education system is always known to undergo a massive transformation by adopting newer and advanced technologies. In the 21st century students are well versed with the use of technological gadgets and web tools of different generations. They are having high degree of creative thinking which helps to develop technology and its contributions in the field of education. The new generation are said to be digital natives. The present day teachers are challenged by these students in the teaching learning contexts due to lack of awareness and understanding of 'smart pedagogic skills'. In the constructivistic classroom the teacher is a scaffolder and not expected to transfer knowledge instead of helping the students 'learn to do'. Creation of knowledge is more important than transfer of knowledge.

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Need and significance of the study

The technological revolution has enthused an ultimate shift in the understanding of diverse pedagogies and its related practices. Technology pervades in all walks of life and in almost every field of human endeavour. Technology skills are becoming essential in all subject areas because the computer is now the universal vehicle for all accomplishment and dissemination of information in all fields. Therefore, in order to function and work effectively in a technology- oriented society, students must develop fundamental and computer skills and also develop ability in using a variety of technology tools to solve various academic problems. The development and progress of these skills is the sole duty and responsibility of the schools and teachers.

Creativity acts as a determinant for a nation's progress. India needs men of creative thinking ability who can produce a number of solutions for the problems facing the society, envisages different strategies, find original and novel ideas and view the problem from various angles. In this regard the Education Commission (1964-66) observed that the talent has to be located early and allowed to grow in the best atmosphere and under the best teachers. This indicates that an understanding of the concept and correlates of creativity is essential for the identification and fostering of creative talent.

Creativity generates new and worthwhile ideas by exploring innovative formats and communicate new ideas effectively and being responsive to diverse perspectives. It demonstrates originality and understands the realworld limits to adopting new ideas and views failure as an opportunity to learn. Creativity innovation is a long term cyclical process of small successes and frequent mistakes, and act on creative ideas to make a useful contribution to the field in which the innovation will occur. Hence creativity and innovation are particularly important in this world of rapid change.

Creativity is one of the most highly valued human values. Creativity affects not only the scientific progress but also society in general. Those nations, which learn best how to identify, develop and encourage creativity in their people, may find themselves in a very advantageous position. For a nation to survive in the international competition it must utilize its creative talent to the highest possible extent

Proper education, care and provision of opportunities for creative expression inspire, stimulate and sharpen the creative mind for a significant contribution. Therefore, the educational process should be aimed at developing creative abilities among children. The opportunity provided to the children should nurture the minds who are potential leaders, scientists, educationists and above all the builders of the global village.

The purpose of this study was to investigate the relationship between Techno-Pedagogical Skills and Cognitive Correlates of Student Teachers at Secondary Level. It enable the student teachers to be a digital citizen and help them to manage the content.

Statement of the Problem

The Statement of the problem entitled as "A study on the relationship between Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level".

Operational Definitions

The investigator operationally defines the key terms which needs clarification.

a) Techno-Pedagogical Skills: - Techno-Pedagogical Skills refers to the skills needed to use technology for pedagogical reasons and competence to integrate technology in teaching.

In the present study investigator intends to measure the skill in Basic Technology operations, Professional use of Technology, Creating technological Environments for learning, Web use/Online collaboration, Application of technology in teaching and learning, Guidance and Evaluation.

b) Creativity: - Creativity may be defined as the capacity of a person to produce compositions, products or ideas which are essentially new or novel and previously unknown to the producer (Dravadahal, 1993).

c) Student Teacher: - A student teacher who is studying to be teacher and who, as part of training,, observes classroom instruction or does closely supervised teaching in an elementary or secondary school.(https:// www.dictionary. com).

d) Secondary level:- Secondary level of education refers to the education covering 2-3 years of academic study starts with classes 8th -10th.

Objectives of the study

The objective formulated for the present study was: To find out the relationship between Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level.

Hypothesis of the study

The hypothesis formulated for the present study was

There is a significant relationship between the means of scores on Techno-Pedagogical Skills of Male and Female Student Teachers at Secondary Level.

Methodology of the study

Normative survey method is adopted for the conduct of present study. The details of the present investigation, ie, population, sample, variables, and tools with regard to the study as follows.

Population:- All the students studying in Bachelor of Education(B.Ed) were treated as population of the study.

Sample:- The present study was conducted on a representative sample of 1022 Student Teachers at Secondary Level.

Variable: The variable of the present study is the relationship between Techno-Pedagogical Skills and Creativity of student teachers at Secondary Level.

Tools: The investigator used a self constructed tool titled "Questionnaire on Techno-Pedagogical Skills" and the standardized Passi Test of Creativity (1979) was used. Questionnaire having 53 questions were used to find out the Techno-Pedagogical Skills of Student Teachers at Secondary Level. Passi Test of Creativity (1979) is a non-verbal test of Creativity used in educational settings. The test were administered personally and the data was collected and analyzed statistically.

Statistical techniques used:- Inorder to determine whether any significant

relationship between Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level r was used.

Analysis and Interpretation of the Data

Test of significance of the relationship between the variables

Data and results of the of significance of relationship between the scores on Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level.

Relationship between the scores on Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level.

Variables	Number	df	Calculated <i>r</i> -value	Remarks
Techno-Pedagogical Skills	1022	1020	.432	Significant at .05 level
Creativity				

From the Table 4.15 the investigator observed that the obtained r-value between Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level was .432 which shows a positive relationship between Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level. The calculated r-value 0.432 is greater than the table value .062 at .05 level of significance with degrees of freedom 1022. This indicated that the null hypothesis titled "There is no significant relationship between Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level" is not accepted and research hypothesis is accepted.

Conclusion

Table 1

The study revealed that there is significant positive correlation between Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level. This inferred that Techno-Pedagogical Skills and Creativity are positively correlated and increase in Techno-Pedagogical Skills also increase Creativity of Student Teachers at Secondary Level.

Implications of the Study

India is evolving at faster pace over the last few years in terms of digital education in India. The way of conceptualization has changed in the way students learn different concepts and theories in schools and colleges. However, the result of this study clearly indicate that Techno-Pedagogical Skills and Creativity has to be spread into teacher education. For this, different teaching strategies should be used to develope Techno-Pedagogical skills and creativity. The results also revealed that Techno-pedagogical skills of the B.Ed. students should be enhanced through computer training programme. This should be given serious attention since teacher education is the provider of current and future teachers. Such lacking of focus on current education needs would continue the problem related to the ill equipped teachers.

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The present study helps in highlighting the extent to which the teachers are competent in using technology in teaching. It is a step towards developing an idea on both the positive and negative sides of the teachers. The study helps to attain a clear knowledge about the techno-pedagogical skills and creativity of the teachers and to explore that how far teachers are using and applying these effectively for teaching the students. The study also helped to highlight the kind of resources made available to teachers; finding out the ways and means in which field or area they are lacking behind, attitude towards the use of technology, ability of accessing to technology and the factors that are stopping them from using technology in their teaching. The findings of this research will have profound importance for the development of techno-pedagogical competence, creativity, computer skills and usage of various aids by instructors in teaching profession and may help increase the use of technology among teachers by overcoming various barriers which stops them from using and integrating technology in teaching.

References

- Best, J.W., & Khan, J.V. (2008). *Research in Education*. New Delhi: Prentice-Hall of India.
- Beaudin, L., and C. Hadden. 2004. Developing technopedagogical skills in preservice teachers. In Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2004, 492-498.
- Norfolk, VA: Association for the Advancement of Computing in Education. Beisser, S. R. 2000. Technology mentorships in higher education: An optimal match for expanding educational computing skills. In Faculty development, ed.
- Gillan and K. McFerrin, 441-447. http:// www.eric.ed.gov/ERICDocs/data/ericdocs2/ content_storage_01/000000b/80/22/77/5e. pdf (accessed November 14, 2005).
- Mishra, P.,& Kohler, M.J. (2015) TPACK Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. Retrieved from : http:// ijedict.dec.uwi.edu/viewarticle. php?id=194&layout=html
- Yates, E., & Twigg, E. (2017). Developing Creativity In Early Childhood Studies Students. Thinking Skills And Creativity. 23, 42-57. Http://Dx.Doi.Org/10. 1016/J. Tsc.2016.11.001

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IMPACT OF OCKHI ON THE EDUCATIONAL AND SOCIO CULTURAL LIFE OF FISHERMEN COMMUNITY

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Abstract

A natural calamity causes drastic changes in the basic pattern of the socio cultural life of societies.Ockhi has become a source of such affirmative changes in the basic life structures of Keralites, which happenedin November 2017; the impact is evident in the social structure of the society.This study is an attempt to identify educational and sociocultural changes that occurred in the coastal regions of Alappuzha district of Kerala after Ockhi hit. This paper is based on a normative survey which was conducted among the people of Ockhi affected area.

Key words: Ockhi, socialstructure, social change, coastal pedagogy, myths of the sea

Introduction

Every contingent situation results in a change i.e... change of social structures. The degree of change depends upon the intensity of contingency. In the case of natural calamities, the effect was greater on the nature as well as the socio-cultural mechanisms of a society. For example, issues related to global warming modified our attitude towards nature, environmental pollution and its effects changed our concern of circumstances, flood happened in Chennai some years ago, altered our theories and norms in town planning, earthquake of Gujarat (Bremer, 2003) made us aware of the earthquake resisting constructions, smog in New Delhi made whole country aware of the adverse effect of air pollution. Thus each and every natural calamity causes a change in the basic pattern of the social structure which is affected by it.

Here, through this paper researcher tries to analyse how Ockhi, one of the most ferocious natural calamities witnessed by Kerala in the last decade, modified various aspects of the social structure of fishermen community. They were affected directly

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by the cyclone, eventually mechanisms of socio cultural changes happened in their society and some changes were found in the nearby communities too.Social structure may be defined as the patterned social arrangements in society that are both emergent from and determinant of actions of the individual(Hewitt & DeLisi, 2016). On a wider range, social structure is a system of socioeconomic stratification, social institutions, or other patterned relations between large social groups. Socio cultural life is intensely and inseparably interlinked with the social structure of the society. Important elements of social structure (Porpora, 1987) are

a. Values

At top level, consider societal values, they are the most general or abstract normative conceptions of what the ideal society itself would like. At the next level, go for individualvalues, which enable a person to become a better man.

b. Groups and institutions

Social structure can be viewed in terms ofinter relationships of the component parts. Social structure includes social groups and institutions. These are called the major groups and institutions. Four of these family, economic institutions, political institutions and religious institutionscentre upon getting food and other items of wealth, procreation, worship and ruling. The community is the total organised life of a locality, is the most spontaneous and effective grouping in a social structure. The spontaneous configurations are responsive to various interests that develop within the community.

c. Organisations

In modern societies, people tend to establish certain organisations for the pursuit ofspecific purposes (Wollmann, 2004). These organisations often called associations. They are group manifestations of life and common interests.

d. Collectivities

They are specialised collectivities (Coleman, 1971) such as families, firms, schools, political parties etc. Differentiated institutional patterns almost directly imply the existence of collective and role units whose activities have different kinds of functional significance.

e. Roles

Within all collectivities everyone has certain roles. It changes in accordance with the circumstances. Role occupants have to fulfil their obligations to other people. For example, in a family the father has obligations to his children. Thus, roles can be considered as the most important element of social structure.

f. Norms

Norms can be broadly divided into two, (i) social norms and (ii) individual norms. Social norms may further divided into (a) obligatory or relational and (b) permissive or regulative(Husted & Allen, 2008). Some norms specify positive obligations and sometimes they are not commonly applied to all the roles and sub-groups. For example, positive obligations of a firm may not be applicable in a family.

Some other norms specify the limit of permissive action. A role occupant of a sub-

group in this case 'must' do or 'must not' do certain things, 'may do' or 'may not' do certain things are called regulative norms. They do not differentiate between roles and sub-groups. For example in our society, regardless of one's role, one must not threat others.

The components of social structure are human beings, the structure being an arrangement of persons in relationship institutionally regulated and defined.

Need and Significance

Structure of a society changes every day. Recovering of an emergency situation and its experiences give a special energy for social changes. Kerala was hit by a deadly cyclone named Ockhi, which became a reason for the social changes among fishermen communities of the state. It is necessary to know the range of changes that happened in this scenario for the implementation of better projects for the Ockhi affected communities. In addition, understanding the changes at the grass root levels of the society would help us to modify the educational strategies for better teaching-learning processes. Hence the present study becomes highly significant and relevant in the recent context with respect to educational and socio cultural changes that took place in Kerala especially, in the coastal areas of Alappuzha district.

Objectives of the present study

The following are the objectives of the present study.

1. To find out the after effects of Ockhi that hit Kerala in the year 2017 in the social settingof fishermen community in Alappuzha district.

- 2. To analyse the changes in the system of education among the Ockhi affected communities.
- 3. To identify the visible changes with respect to notions towards sea and its mechanisms among the people of Kerala, especially Fishermen community in Alappuzha District.

Methodology

The study followed a normative survey method by providing a set of questions based on the criteria set by the investigators. The questionnaire consisted of 25 questions, which were constructed based on the threecriteria namely, after effects of Ockhi in general, changes with respect to educational system and visible changes with respectto notionstowards sea and its mechanisms. Responses were taken from a sample of 35 people of different age groups ranging from20 to 65who belonged to different sectors of the societyfrom five different Grama Panchayats, which were considerably affected by Ockhi namely Arattupuzha, Arthunkal, Kadakkarappalli, Purakkad and Thrikkunnapuzha. Apart from that, the investigators conducted interviews with 25 people from these Grama Panchayats, based on the three criteria.

Findings of the Study After effects of Ockhi in general

- The status of religious institutions has been changed to social supporting institutions.
- The activities of Kudumbasree and selfsupporting groups started giving more attention to sea related issues.
- Family as institution show greater concern in sea related issues and as a

result people living on the seashore began to move away from there.

- Youth clubs were active in the recovery process soon after Ockhi, but now after one year, almost all of the youth clubs have lost their interest in sea related issues.
- Administrative bodies of government are working with more conscious efforts and and have become alert in issues related to sea.
- Central and state governmental institutions have increased their funds for monitoring sea related issues.
- Self-supporting groups of fishermen plan to do other jobs for their living, but lack of skill in doing other jobs creates hindrances.
- The role of bread earning member of the family is been modified, other members of the family earn through different jobs other than fishing.

Changes with respect to educational system

- In education system the emergency response system has been introduced in the form of 'coastal pedagogy'.
- In religious instructions like Sunday schools, began to include living stories in relation to sea are increased.
- Schools as a social supporting institutions are more active in the activities related to sea.
- Advises in the form of moral stories have been increased from the part of elder people regarding calamities related to sea.

Visible changes with respect to notions towards sea and its mechanisms

- People of fishermen communities are now aware of the science behind movements of sea and they have increased their faith in technologies.
- Concern of sea and sea related myths have been increased; the holy status of sea is augmented.
- The constructions tend to become seafriendly and the natural structure of seashore is preserved.
- Fishermen used to take sand from seashore, but after Ockhi this tendency seems to be decreasing.
- Natives of seashore have developed a habit of planting trees around them.
- Governmental programmes like MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) are more attentive in the protection of seashore, for that they execute programmes like planting trees on shore, renovation of drainage systems etc.

Suggestions for further Study

Most of the socio cultural changes caused by Ockhi are positive in nature. Changes in socio-structural system may have influenced the educational, economic, political and cultural patterns of the society. Those changes can be analysed for better understanding of the scenario. Further studies can be conducted among the youth of the seashore and changes of attitudes in their life styles. Studies can be conducted to identify the governmental and non - governmental interventions and the comparative effect also can be analysed.

Conclusion

It is evident from the responses of respondents that Ockhi has modified the entire social structure of fishermen community and most of the changes happened are affirmative and helpful for the society and it is apparent in the functioning of it. They may be happened as result of shock which is produced by the emergency situation resulted by Ockhi, but if they sustain, they would help the overall development of the society. Progressive changes in any society, always tend to accelerate the ability to survive the life threatening situations.

References

- Bakir, H., & Eesa, M. T. (2016). Language and Social Structure."[PDF file]"
- Bremer, R. (2003). Policy development in disaster preparedness and management: lessonslearned from the January 2001 earthquake in Gujarat, India. *Prehospital and disaster medicine*, 18(4), 372-384.
- Coleman, J. S. (1971). Control of collectivities and the power of a collectivity to act. *Social choice*, 269-300.
- Hewitt, J. D., & DeLisi, M. (2016). *Delinquency in society*. Jones & Bartlett Publishers.

- Husted, B. W., & Allen, D. B. (2008). Toward a model of cross-cultural business ethics: The impact of individualism and collectivism on the ethical decision-making process. *Journal* of Business Ethics, 82(2), 293-305.
- Lindkvist, L. (2005). Knowledge communities and knowledge collectivities: A typology of knowledge work in groups. *Journal of Management studies*, 42(6), 1189-1210.
- Porpora, D. V. (1987). *The concept of social structure* (No. 68). Greenwood Press.
- Smelser, N. J. (1988). Handbook of sociology, London: Sage.
- Thompson, B., & Kinne, S. (1990). Social change theory: Applications to community health. *Health promotion at the community level*, *2*, 29-46.
- Wollmann, H. (2004). Local government reforms in Great Britain, Sweden, Germany and France: between multi-function and singlepurpose organisations. *Local Government Studies*, 30(4), 639-665.

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ENROLMENT OF MUSLIM STUDENTS FOR TWO YEAR M.ED COURSE IN NORTH MALABAR

Dr. Sahala P.M.*

Abstract

This paper focuses on the educational attainment of Muslim students in teaching profession in North Malabar. The objectives of the study were to find out the enrolment of Muslim students for two year M.Ed course under Kannur University and Central University of Kerala and to provide suggestive measures to enhance the higher cum professional education of Muslim community. Survey method was adopted for the study. The population comprises of 160 students; in which only 6 were Muslims. Self administered questionnaire and interview schedule were the tools used for the study. Percentage analysis was used to analyse, tabulate and interpret data. The finding reveals that the enrolment rate of Muslims were low. Therefore, this study suggests that in order to enhance the education of Muslims; it is the need of the hour to develop awareness by the parents and teachers regarding Muslim students' education. Motivation and encouragement need to be provided; equal importance should be given to religious and modern education. Authorities should take initiative to provide necessary information regarding the importance of course by imparting orientation programmes and talks for the parents and students regarding the institutions and the availability of financial aid. It is only through this the enrolment of Muslim students in Master of education programme can be enhanced.

Keywords: M.Ed course, North Malabar, Educational attainment, etc

Introduction

Education creates positive outlook towards life thereby facilitating one's learning, knowledge and skill. It in turn reduces gender discrimination and poverty. Education can be divided in to three levels; primary, secondary and tertiary. Higher education belongs to tertiary level and includes graduation, post graduation and professional education. Individuals who successfully complete their tertiary level of education will receive certificates and academic degrees. Studies related to the education of Muslims in India reveals that they are backward in all aspects of development. Sachar Committee report is

* Ad hoc Assistant Professor, School of Pedagogical Sciences, Kannur University pmsahala@ gmail.com an eye opener in this regard. According to Census 2011, the literacy rate of males and females in Kerala was 96.02% and 91.98% respectively. Kerala holds first place in female literacy. Though there seems to be an increase in the literacy rate, the education of Muslims in North Malabar especially their enrolment in higher education including professional education is low. Kannur University was established by the Act 22 of 1996 of Kerala assembly. The objectives of the Kannur University is to establish in the state of Kerala a teaching, residential and affiliating University promoting the development of higher education to the people of Kasargod, Kannur and Mananthavady taluk of Wayanad districts. Central University of Kerala is one of the 15 Central University established under the Central University Act 2009 by Indian Parliament. The University lies in Kasargod, the northern most districts in the State of Kerala.

NCTE (National Council for Teacher Education) is a statutory body established in 1996 by the Government of India. Its objective is to plan coordinated development of teacher education system, regulate, maintain and monitor norms and standards in teacher education. There are various programmes recognised by NCTE. One among them is M.Ed programme leading to the Master of Education. It is a post graduate cum professional course which deals with the methodology of educational research and experimentation of new techniques of teaching. M.Ed curriculum has been revised and it's of 2 year duration from 2015 onwards. After the completion of the course, there are opportunities for them for research, administration and to become

teacher educator in teacher training colleges including primary, secondary and tertiary level of education.

The region of North Malabar extends from Kora River in the south to Manjeshwar in the north of Kerala. The region is mainly covered by the coastal areas. Muslims form one of the major minority communities in this region. Muslims belonging to this region are commonly known as 'Mappilas'. According to Logan (1951), the term Mappila has originated from two Malayalam words maha and pilla. Maha means 'great' and pilla means 'son'. Therefore, Mappila means the 'great son'. Mappilas are considered to be as the descendents of Arab traders. Their chief occupation is fishing, head loaders, working as labourers in Gulf countries and self employment. Kannur University and Central University of Kerala situated in Kasargod falls under this region.

Teaching is a noble as well as mother of all other professions as it is the strongest and powerful pillar of the society. Primary source of data is used for the study. The study on Muslim women in North Malabar reveals that the teaching is the most apt profession especially for Muslim women. It is in this aspect, the investigator attempt to conduct a study on the enrolment of Muslim students for two year M.Ed programme focussing on North Malabar and to suggest the measures for upbringing the community in teaching profession.

Objectives of the Study

The present study is designed and carried out to understand the enrolment of Muslim students for two year M.Ed course from Kannur University and Central

University of Kerala during the academic year 2015 to 2020. Therefore, on the basis of this the objectives were formulated.

- To find out the enrolment of Muslim students for two year M.Ed course in North Malabar.
- To suggest measures to enhance the education of Muslims in teaching profession.

Methodology of the Study

Study was carried out through purposive random sampling method. Survey method cum interview schedule was used for the study to collect data from Muslim students pursuing M.Ed from Kannur University and Central University of Kerala.

Population

Population of the present study includes two University Campuses belonging to North **Results and Interpretations**

Table 1

Enrolment of Muslims in Central University of Kerala

Malabar. The total strength of the students for the two year M.Ed course from these two Universities was 160.

Sample

For the present study, sample comprises of Muslim students belonging to Kannur University Campus, Dharmasala and Central University of Kerala, Kasargod. The total number of Muslim students hailing from these two Universities for M.Ed course from the year 2015 to 2020 was 6.

Tools Used for the Study

Self administered questionnaire and interview schedule was used to collect data.

Statistical Methods

Percentage analysis was done to analyze, tabulate and interpret data.

Sl.No.	Year	Strength of students	Enrolment of Muslims		Total number of
			Boys	Girls	Muslim students
1	2015-2017	12	2	-	2
2	2016-2018	20	-	-	-
3	2017-2019	17	2	-	2
4	2018-2020	41	-	1	1
	Total	90	4	1	5

The above findings reveals that the enrolment of Muslims for two year M.Ed course is seem to be low. As per the norms of NCTE, the intake of students for M.Ed has increased to 50.unfortunately, for the last 4 years more than 50% of the seats were vacant. Recently, the enrolment of students was found to be 41 out of 50 seats. Though this is an encouraging one, the rate of Muslim students was found to be less. The study shows that for the last three years there was no Muslim girl student. In 2016-

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2018 M.Ed batches, there was no Muslim representation. In 2018-2020 batches, one girl has enrolled from North Malabar region. M.Ed admission was conducted through entrance examination. Recently, spot admission was conducted to increase the enrolment of students to this course. But still, a few seats remained vacant. From the year 2015 - 2020, less than 1% of Muslim enrolment was seen. Enrolment of Muslim boys seems to be higher than that of girls. This shows that Muslims from North Malabar is not much interested in taking up this course.





Table2

Enrolment of Muslims in Kannur University Campus.

Sl.No.	Year	Strength of students	Enrolm Mus	nent of lims	Total number of Muslim students
			Boys	Girls	
1	2015-2017	30	-	-	-
2	2016-2018	12	-	-	-
3	2017-2019	14	-	1	1
4	2018-2020	14	-	-	-
	Total	70		1	1

Figure1

Figure 2

Graphical representation of enrolment rate of Muslims in Kannur University Campus.



The study reveals that though the intake of students for two year M.Ed course has increased from the 30 to50, the seats were not fully occupied by the students. More than 50% of the seats were remained to be vacant as there are no candidates to pursue M.Ed course. In this academic year, total of 14 students were enrolled for this programme. There was no Muslim representation. The study found that for the two year M.Ed course,
there were no Muslim boys. In 2017-2019 batches, only one Muslim girl hailing from North Malabar is pursuing M.Ed. This shows that attitude of Muslims towards higher cum professional course is not much encouraging. The study found that, instead of pursuing two year course, most of the students prefer to get employed after their B.Ed course and prepare for State and National level examination. Few of the students find no use in studying M.Ed as they see no benefit in attaining job after the completion of the course.

Suggestive Measures to Enhance the Education of Muslims

- Parents and family should promote the education of Muslims by providing Motivation and encouragement.
- Lack of awareness of parents and family members towards higher cum professional education hinders the educational aspiration of Muslims. This can be rectified by providing talks and guidance by the authorities which can influence in the outlook and aspirations of parents towards their daughter(s) and son(s) education.
- The State educational authorities should take initiatives for imparting orientation programmes for the parents and students about the various ongoing academic courses, institutions and the availability of the financial aid.
- Muslim boys of North Malabar after their higher secondary education mostly acquire job oriented diploma courses and are migrating to gulf countries. They prefer least educated girls for marriage. This in turn creates difficulty for the Muslim girls to continue their higher education. This attitude of the boys

needs to be changed. Unless boys are not pursuing their higher education, it will affect the education of Muslim girls too.

- Teachers are considered as the second parent and role models for the students. Most of the teachers have an assumption that Muslim students will not pursue their education successfully. They are not much encouraged to continue their education. This negative attitude and prejudice on the part of teachers regarding the education of Muslim students need to be changed.
- Teachers should provide special care and attention for Muslims who are in need of their support and guidance.
- Lack of awareness regarding M.Ed course. Few students see this course as a waste of time, money and effort. They are of the opinion that M.Ed course fails to render job opportunities. Most of them prefer M.Ed only as a substitute for SET (State Eligibility Test).Students must be made aware by the authorities regarding the need and importance of M.Ed course, research and various job opportunities during their B.Ed level of education.
- The study found that religious education is given more importance than modern education. Religious education alone will not increase the socio-economic conditions of Muslims. Therefore, both religious and modern education should be considered as equally important.
- Due to Poverty and unemployment of parents, Muslims are forced to discontinue or remain far from achieving higher education. Most of them are unaware of the scholarships provided by the State and Central Governments.

Hence, it is the duty of teachers and the authorities to inform and to make necessary arrangements to disburse the grants for the students at proper time to carry out their education successfully.

• Education of Muslims is not seen as an investment by the parents. Instead of providing higher education, parents prefer their son(s) to work abroad or to engage in self employment. For daughter(s) they prefer getting her married rather than continuing education.

Conclusion

It is evident from the study that the enrolment of Muslims for two year M.Ed course in North Malabar seems to be deteriorating. Out of 160 students, only 6(3.75%) of them belongs to Muslim community. From the year 2015 to till date only two Muslim girls and four boys were enrolled for M.Ed course. This finding is an eye opener for the authorities and community regarding the higher cum professional education of Muslims in North Malabar. There are various factors that hinder the education of Muslims. They are lack of awareness and motivation from the parents and teachers, affinity of boys towards gulf countries, financial constraints and unemployment of parents, unawareness regarding various scholarships and more emphasis for religious education. Thus, the study highlights that the enrolment of Muslim students for two year M.Ed course programme is too low.

References

- Logan, W. (1951). Malabar Manual, 2, Madras: Government Press.
- Miller, R.E. (1976). Mappila Muslims of Kerala: a Study in Islamic Trends. Madras: Orient Longman.
- Nayar, U. (2007). An analytical study of Muslim women and girls in India. New Delhi: Ministry of women and child development.
- Sachar, R. (2006). Social, Economic and Educational Status of Muslim Community of India: a Report. Prime Minister's High Level Committee, Cabinet Secretariat, New Delhi: GOI Press.
- Sharma, U. (2018). Education Tomorrow. New Delhi: Jnanada Publication.

Websites

http://ncert.nic.in/index.html.

http://ncte.nic.in.

http:// census.gov.in

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EFFECT OF GROUP CORDINATION OF MALE NETBALL PLAYERS OF VARIOUS UNIVERSITIES IN KERALA, INDIA

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Abstract

Cohesion has historically been considered one of the most important variables in the study of small group dynamics and has historically been one of the most frequently studied of group-level constructs. The purpose of the study was to analyse the group cohesion among inter collegiate male Netball players from four universities of Kerala state. Age of selected students ranged from 18 to 25. The Group Environment Questionnaire (GEQ) developed by Carron, Widmeyer and Brawley (1985) was used to assess group cohesion among the subjects. The ANOVA and LSD post hoc analysis used to find significant difference between groups on independent variables (individual attraction to group, social individual attraction to group task, group interaction social, group interaction task).

Keywords: Team cohesion, netball players, gender, universities and Kerala.

Introduction

Team cohesion is "a dynamic process that is reflected in the tendency for a group to stick together and remain united in its pursuit of instrumental objectives and/or for the satisfaction of members' affective needs". The definition incorporates the concepts of task and social cohesion. As a group is usually founded to accomplish a purpose, task cohesion plays a fundamental role in the functioning of every group. Another cohesive force which often develops in time is that of social cohesion among the group's members. Carron, Brawley, and Widmeyer (1998). Accordingly, in the field of athletics, team cohesion is a research topic worth exploring; the level of team cohesion is a key factor most likely to affect players' feeling of satisfaction and sport performance, and

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team cohesion will help determine the result of a contest (Carron and Chelladurai, 1981; Lu, 1994). Martens and Peterson (1971) found that higher team cohesion will lead to better sport performance. There are also other possible reasons for promoting cohesion. It has been found that adherence behavior (Prapavessis & Carron, 1997), adherence to training schedules (Carron, Widmeyer, & Brawley, 1988), conformity to group norms (e.g., Shields, Bredemeier, Gardner, & Boston, 1995), assuming responsibility for negative outcomes (e.g., Brawley, Carron, & Widmeyer, 1987), tolerance of the negative impact of disruptive events (e.g., Brawley, Carron, & Widmeyer, 1988), and collective efficacy (e.g., Paskevisch, Brawley, Dorsch, & Widmeyer, 1999) relate to greater cohesion. There are ways of improving cohesion. Cohesiveness is greater in smaller groups (Widmeyer, Brawley, & Carron, 1990). Cohesion is also boosted by altruism (Prapavessis & Carron, 1997), participation in team goal setting (Brawley, Carron, & Widmeyer, 1993), and democratic leader behavior (e.g., Kozub, 1993; Westre & Weiss, 1991). Cohesion may not always lead to more effective group performance. Paskevich, Estabrooks, Brawley, and Carron (2001) suggested that cohesion may be associated with pressure to conform, group think. However, studies on the potential harmfulness of team cohesion in the area of sport psychology are few.

Team cohesion is the ingredient that molds a collection of individuals into a team (Cox,2006). Carron wrote of determinants of team cohesion (Cashmore, 2002). Situational factors such as living with or near each other, sharing hobbies and activities, similar uniforms and clothing, rituals of group cohesion, and a unique distinctiveness as a group. Personal factors, such as commitment and satisfaction, leadership factors, and a democratic style of leadership also support team cohesion. Team factors that support cohesion includes the clarity with which each member understands and accepts his role with the team. Another factor is success. Success in competitive sports increases team cohesion. Further, as was discovered by other researchers, Carron concluded that smaller teams are more cohesive.

The purpose of the study was to evaluate team cohesion of male intercollegiate netball players belonging four leading Universities in Kerala according their positions in respective inter collegiate tournaments.. The result of the study can contribute towards strengthening an awareness of the importance psychological constructs and their application at all levels of the game. It was hypothesized that there would be differences between different position holders in inter collegiate tournaments on the basis of performance in team cohesion attributes of players.

Materials And Methods

The participants in the study were 178 male netball players of Kerala University, MG University, Calicut University and KTU, who secured first, second, third and fourth position in their respective inter collegiate competitions.

The details of the subjects of the study were presented on Table 1:

Group	University	Ν
1	Kerala University	44
2	M G University	59
3	Calicut University	45
4	KTU	30
	Total	178

Table 1Details of male participants in the study

Instrumentation

Environment Group Questionnaire (GEQ) (Brawley et al., 1987). The GEQ assessed perceived cohesion through the use of an 18-item, four scale instrument (3). Four components of cohesion are measured identifying a member's attraction to the group-task (ATG-T), a member's attraction to the group-social (ATG-S), a member's integration into the group-task (GI-T); and a member's integration into the group-social (GI-S) (17). Internal consistency values were r=.75, .64, .71, and .72 respectively (3). Responses for this questionnaire were based on a 9-point Likert scale (24). Nine questions referred to participants' personal involvement with the team and nine questions referred to participants' perceptions of their team as a whole. Participants' scores were tallied based on each of the four variables to assess overall group cohesion. The odd numbered questions referred to the social aspects of cohesiveness, whereas the even numbered questions referred to task aspects of cohesiveness. An average was taken for each component (ATGS, GIS, ATGT, and GIT) after being summed for each participant.

The participants had respond to items on 1 to 9 strongly disagree and strongly agree between this answer are calculated in the 18 item questions. At the time of calculation maximum score is 9 and lowest score is 1. There are stared questions they are calculated in reverse order and the total score is divided by total questions.

Data Collection

The measurement was conducted over a 1 month of period in 2018 Februvary. The samples were taken from the intercollegiate male netball players of Kerala state who participated in university level competition during 2017-2018 academic years. Group cohesion questionnaire (Carron, Widmeyer and Brawley 1985) was administered to the Sample to assess the team cohesion viz., Individual attraction to group-Task, Individual attraction to group-social, Group interaction-task, and Group interaction social Participants were given assurances of confidentiality and each provided written consent prior to completing the questionnaires. Most questionnaires were completed following training sessions

Data Analysis

The Volleyball players belong to different colleges of four universities in the state of Kerala (Kerala University, M.G University, Calicut University and KTU). The univariate analysis of variance (ANOVA) was computed to assess difference on mean scores on group cohesion. The data were analyzed by using SPESS version 20.0 (SPSS inc. Chicago,IL) LSD post hoc analysis was performed when satisfied significance (p<.05) was obtained to identify pair wise differences.

Results And Discussion

Table 2

Individual attraction to group social, Individual attraction to group task, Group integration social and Group integration task

Variables	Winners (n=44)	Runners (n=59)	Third Position (n=45)	Fourth Position (n=30)
Individual attraction to group social	7.400	6.722	6.618	6.427
Individual attraction to group task	6.6375	6.6051	6.4722	6.1183
Group interaction social	7.09	6.92	6.91	6.53
Group interaction task	6.336	6.220	5.660	5.543

Team cohesion and performance of dependent variable of individual attraction to group social of Winners mean was 7.400 with standard deviation of 0.9058., Runners mean was 6.722 with standard deviation of 1.4302., Third position mean was 6.618 with standard deviation of 1.5123 and Fourth position mean was 6.427 with standard deviation of 1.1371.

Team cohesion and performance of dependent variable of individual attraction to group task of Winners mean was 6.6375 with standard deviation of 1.8626., Runners mean was 6.6051 with standard deviation of 1.63179., Third position mean was 6.4722 with standard deviation of 1.53577 and Fourth position mean was 6.1183 with standard deviation of 1.54147.

Team cohesion and performance of dependent variable of group interaction social of Winners mean was 7.09 with standard deviation of 1.309., Runners mean was 6.92 with standard deviation of 1.277., Third position mean was 6.91 with standard deviation of 1.411 and Fourth position mean was 6.53 with standard deviation of 0.860.

Team cohesion and performance of dependent variable of group interaction task

of Winners mean was 6.336 with standard deviation of 1.4317., Runners mean was 6.220 with standard deviation of 1.3805., Third position mean was 5.660 with standard deviation of 1.2337 and Fourth position mean was 5.543 with standard deviation of .8460.

The result of the study clearly indicate that winners having higher mean score on all selected dependent variable followed by runners, third position and fourth position. Graphical representations of the mean scores are given in Fig 1.



Fig 1

Mean scores of team cohesion and performance of dependent variables of different Universities

Table 3

ANOVA between subject effects

Source	Type III sum of squares	df	Mean	F	Sig
Individual attraction to group social	21.842	3	7.281	4.338	.006
Individual attraction to group task	5.887	3	1.962	.731	.535
Group integration social	5.648	3	1.883	1.181	.318
Group integration task	19.293	3	6.431	3.907	.010

The results of ANOVA reveals that there was a significant differences between team cohesion & performance of variable individual attraction to group social [F (3.154)] =4.338, p=.006]& Group integration Task[F (3.154)=3.907,p=.010]. No significant differences were found between other dependent variables.

Table 4

Post-hoc test on significant Dependent Variable individual attraction to group task

Dependent Variable		Mean Differ-	Std. Er-	Sig.	
	Ĩ		ence (I-J)	ror	e
ATGS	Winner	Runner	.6780*	.2581	.009
	(M=7.400)	Third Position	.7822*	.2747	.005
		Fourth Position	.9733*	.3067	.002
	Runner	Winner	6780*	.2581	.009
	(M=6.722)	Third Position	.1043	.2564	.685
		Fourth Position	.2954	.2905	.311
	Third Position	Winner	7822*	.2747	.005
	(M=6.618)	Runner	1043	.2564	.685
		Fourth Position	.1911	.3054	.532
	Fourth Position	Winner	9733*	.3067	.002
	(M=6.427)	Runner	2954	.2905	.311
		Third Position	1911	.3054	.532

GIT	Winner	Runner	.1160	.2556	.650
	(M=6.336)	Third Position	.6764*	.2720	.014
		Fourth Position	.7930*	.3038	.010
	Runner	Winner	1160	.2556	.650
	(M=6.220)	Third Position	.5603*	.2539	.029
		Fourth Position	$.6770^{*}$.2877	.020
	Third Position	Winner	6764*	.2720	.014
	(M=5.660)	Runner	5603*	.2539	.029
		Fourth Position	.1167	.3024	.700
	Fourth Position	Winner	7930*	.3038	.010
	(M=5.543)	Runner	6770*	.2877	.020
		Third Position	1167	.3024	.700

In team cohesion and performance variable individual attraction to group social Winner and Runner (MD = .6780), Winner and Third Position (MD = .7822) and Winner and Fourth Position (MD = .9733). No significant difference found between Runner and Third Position, Runner and Fourth Position and Third Position and Fourth Position on team cohesion and performance variable individual attraction to group social.

In team cohesion and performance variable group interaction task significant difference between Winner and Third Position (MD = .6764), Winner and Fourth Position (MD = .7930), Runner and Third Position (MD = .6703) and Runner and Fourth Position (MD = .6770). No significant difference between Winner and Runner, Third Position and Fourth Position on team cohesion and performance variable group interaction task.

Discussion

Previous research has been conducted in order to identify and explore personal attributes which are associated with performance in sports. Attributes such as

a team and attitudes towards other players in a team have both negative and positive effects (Carron, A. V., Bry, S. R., Eys, M. A, 2002). The findings of the present study showed significant differences between performance and Team Cohesion items of the winning male netball team. The performance in netball is closely associated with high level of technical efficiency and tactical presentation at times of crisis. The execution of the skills in netball like, bounce pass, chest pass, hook pass, shoulder pass as well as bringing in the complication of a defender. Tries to apply the tactical execution in making the ball to land on the opponent's court by deceiving the defenders. Hence to attain success in each move of action and counter action, the team players on the court must function individually first and then as a group. Here the role of cohesion can be very well seen. Individual Attractions to Group-Task has been given emphasis first, then to the Group Integration-Task. Hence the performance in vollevball is closely related with team cohesion. The items of team cohesion like Individual Attractions to the

self-esteem, pride and competition within

Group Task have got the higher mean value in the winning teams than that of the losing teams. It further showed that winning teams had a rise in group's cohesion following the game, while losing teams suffered a decline. Indeed, the cohesiveness of the team is likely to influence the team's performance and more so the player's mood. The data revealed that Group Integration social has been given last emphasis than Individual Attraction to the Group Social and here also the winning teams have shown significant differences while compared to that of the losing teams. The performance of the losing teams in almost all the elements of the game were not in par with winning teams and the findings of the data revealed that the mean values of the items of team cohesion like Individual Attraction to the Group-Task, Group Integration-Task. Individual Attraction to Group – Social were found very low compared to that of winning teams and were not significant. The winning team has shown supremacy in performance in most of the elements of the game like, bounce pass, chest pass, hook pass, shoulder pass as well as bringing in the complication of a defender. than the losers' teams and have shown much better team cohesion also. Players' negative interaction in a team hinders social cohesion thus compromising good performance (Grieve, C., Whelan, K., Myres, H. 2000). This attribute may negatively affect social cohesion needed for successful performance in a team. Players in more cohesive teams may hold stronger shared beliefs in their competence, which in turn may lead to greater team success.

Ruder and Gill (1982) emphasized that winning teams had a rise in groups cohesion

while losing teams suffered a decline. Indeed, the issue of team size and teams' cohesion indicated that the strength of friendship among players increases with decrement in the number of players per team. Ruder and Gill (1982) also reiterated that teams that celebrated their success and embraced a loss collectively were more compact than those who only acknowledged winning alone.

Conclusion

Significant differences were found between the performance and Individual Attraction to Group Social and Group Integration-Task of winning team. No significant difference was found between performance and Individual Attraction to Group-Task and Group Integration-Social of loser's team. Based on the conclusions of the study it is recommended that coaches and players need to consider the factor of cohesion in their teams as it is most likely to be related to win-loss patterns in team sports.

References

- Brawley, L. R., Carron, A. V., and Widmeyer, W. (1987). Assessing the cohesion of teams: Validity of the Team cohesion Questionnaire. Journal of Sport Psychology, 9. P. 275-294.
- Brawley, L., Carron, A., and Widmeyer, W. (1988). Exploring the relationship between cohesion and group resistance to disruption. Journal of Sport & Exercise Psychology, 10. P. 199-213.
- Brawley, L., Carron, A., and Widmeyer, W. (1993). The influence of the group and its cohesiveness on perceptions of group-related variables. Journal of Sport and Exercise Psychology, 15. P. 245-260.
- Carron Brawley and Widener (1985). The development of an Instrument to Assess Cohesion in Sport Teams: The Team cohesion

Questionnaire. Journal of Sport Psychology, 7. P. 244-266.

- Carron A. V., Widmeyer W. N., Brawley L. R. (1985). The development of an instrument to assess cohesion in sport teams: The Group Environment Questionnaire. Journal of Sport Psychology, 7, 244-266.
- Carron, A., Brawley, L., and Widmeyer, W. (1998). The measurements of cohesiveness in sport groups. In J. Duda (Ed.) Advancements in sport and exercise psychology measurements. Morgantown, WV: Fitness Information Technology. P. 213-226.
- Carron, A.V. and Chelladurai, P. (1981). The dynamics of team cohesion in sport, Journal of Sport Psychology, 3. P. 123-139,
- Carron, A. V., Widmeyer, W. N., and Brawley, L. R. (1988). Team cohesion and individual adherence to physical activity. Journal of Sport & Exercise Psychology, 10. P. 119-126.
- Carron, A.V. (1982). Cohesiveness in sport groups: interpretations and consideration, Journal of Sport Psychology, 4. P. 123-128,
- Carron, A.V. and Chelladurai, P. (1981). The dynamics of team cohesion in sport, Journal of Sport Psychology, 3. P 123-139.
- Cashmore, E. (2002). Sport Psychology: The Key Concepts. New York: outledge.
- Cox, R. H. (2006). Sport Psychology: Concepts and Applications (6th ed.). New York: McGraw-Hill.
- Chen, B. Y. (2004). The relationship between the coaches' leadership behaviors perceived by players of a collegiate representative rugby team and team cohesion. Unpublished master's thesis, Fu Jen Catholic University, Taipei County.
- Chang, C. S. (2005). The relationship between coaches' leadership behaviors perceived by cross-strait college handball players and

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team cohesion. Unpublished master's these is, National Institute of Physical Education, Taoyuan County.

- Jarvis, M. (2006). Sport Psychology: A Student's Handbook. New York: Routledge.
- Kozub, S. A. (1993). Exploring the relationship among coaching behavior, team cohesion and player leadership. Unpublished doctoral dissertation. University of Houston, TX.
- Lu, C. H. (1994). Sports Psychology. Taipei: Shita Bookstore,.
- Paskevich, D. M., Brawley, L. R., Dorsch, K. D., and Widmeyer, W. N. (1999). Relationship between collective efficacy and team cohesion: Conceptual and measurement issues. Group Dynamics: Theory, Research, and Practice, 3. P. 210-222.
- Paskevich, D., Estabrooks, P., Brawley, L., and Carron, A. (2001). Team cohesion in sport
- and exercise. In R. Singer, H. Hausenblas, and C. Janelle (Eds.), Handbook of sport psychology (2nd ed.). New York: John Wiley. P. 472-494.
- Shields, D., Bredemeier, B., Gardner, D., and Boston, A. (1995). Leadership, cohesion, and team norms regarding cheating and aggression. Sociology of Sport Journal, 12. P. 324-336.
- Widmeyer, W., Brawley, L., and Carron, A. (1990). Group size in sport. Journal of Sport & Exercise Psychology, 12. P. 177-190.
- Westre, K., and Weiss, M. (1991). The relationship between perceived coaching and group cohesion in high school football teams. The Sport Psychologist, 5. P. 41-54.
- Brawley, L., Carron, A., & Widmeyer, W. (1993). The influence of the group and its cohesiveness on perceptions of group goalrelated variables.

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EFFECTIVENESS OF 7E MODEL ON METACOGNITIVE SKILLS AMONG SECONDARY STUDENTS IN SCIENCE LEARNING

Viswalakshmi. T. V* Dr. T. C Thankachan**

Abstract

The Study aimed to investigate the effectiveness of 7E Model on Metacognitive Skills among Secondary Students of Kerala State. The design selected for the study was true experimental, pretest posttest nonequivalent group design. The sample selected included 80 students of Standard Nine. The tools used in the study were Metacognitive Assessment Inventories and lesson transcripts based on 7E Model and Existing Activity Oriented Method, prepared by the Investigator. The study revealed that 7E Model is effective in improving Metacognitive Skills among Secondary Students when compared to Existing Activity Oriented Method of instruction.

Key words: 7E Model, Metacognitive Skills: Information Management, Debugging Strategy, Planning, Monitoring, Evaluation, Procedural Knowledge, Declarative Knowledge, and Conditional Knowledge.

Introduction

The embodiment of knowledge in all its form is the product of knowledge construction. It begins in human mind and expands as a social issue, become part of the inherited knowledge of the mankind which can freely be used by its members. In every human being there is an inherent impulse to grow. Human growth has an extra dimension that is to develop a more adequate structure and the capacity to function better. Piaget (1973) argued that students do not receive knowledge passively, but discover and constructs knowledge through activities and experiments.

The conventional classrooms sometimes resemble a one-person show with captive but often uninvolved listeners. Classes are generally dominated by teacher centered direct instruction and often rely heavily on text books for the content of the course. Instruction and information are separated

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into parts and makes up a whole concept. The goal of the learner is to regurgitate the accepted explanation or methodology expostulated by the instructor. Various strategies were introduced to improvise the instruction. The situation demands a paradigm shift from teacher-centered education to learner-centered education. Glaserfeld (1984) states that, "learners construct their understanding". Children do not simply mirror and reflect what they are told and what they read. Learners always look for meaning and will try to find out regularity and order in the events of world even in the absence of full or thorough information. Learning therefore is not passive reception of teaching but an active mental work.

7E Model is a constructivist learning cycle enables teachers to conduct a series of activities that are meaningful for students to practice for their process skills and metacognitive skills (Bevevino et al., 1999). It is an effective instructional strategy which is compatible with science, first assesses student's misconceptions and promotes conceptual change (Lawson, 1995). By using this constructivist leaning cycle students learn the concepts profoundly, and adapt the learning gained in the school to their daily life. Using constructivist learning cycle models in science teaching furnishes content of the course, increase student attention towards courses, ensures permanent learning, changes student's prejudgment towards science and make courses more entertaining and fruitful (Ozalp, 2006).

Theoretical background of 7E Model

7E Model is a constructivist learning cycle depends on constructivist philosophy.

Eisenkraft (2003) is the exponent of 7E Model. This model is based on theories of Cognitive constructivism and Social constructivism. The goal of the 7E Model is to emphasize the increasing importance of eliciting prior understanding and extending, or transfer of concepts. Research has supported the effectiveness of 7E Model in encouraging students to think creatively and critically, as well as in facilitating a better understanding of scientific concepts, developing positive attitude towards science, improving science process skills, and cultivating advanced reasoning skill. The 7E Model is a constructivist learning cycle for designing science lessons to foster successful positive experience for students. The 7E Model constitutes seven phases in the teaching learning strategy; Elicit, Engage, Explore, Explain, Elaborate, Evaluate and Extend.

The importance of tasks included in the stage of elicitation is to make students able to review their previous experiences linked with the learning situations they come across at present. By using the tasks of engagement stage, teacher takes an effort to grasp the interest of students and increase their attention, consequently they get ready to learn. The emphasis of exploratory stage is on constructing learning atmosphere for learners which makes observation of scientific processes vivid, develop hypotheses, separate variables, record data, and pattern and consolidate experimental process, create graphical representation, and arrangement of final results. Similarly, the purpose served by the tasks carried out during the explanatory stage is to make learners able to express the comprehension

of relevant notions. Here the instructor provides guidelines to the learners regarding a broader and clear vision, facilitates them by providing new terminologies in science, and reviews the areas which make the learners able to implement these items in elucidation of the findings. The application of tasks set for the stage of elaboration is to help learners in execution of knowledge gained in the past when they come across novel situation. Tasks done during the period of evaluation are considered by the instructors while making students' evaluation of learning on the basis of summative and formative grounds. Fruitful practice in transformation of what is learnt becomes possible using tasks of extension stage. The prime goal of science teaching in the modern period is to prepare a student who is ready to compete the global world. By keeping all these features of 7E Model, Investigator selected it for the study.

Theoretical framework of Metacognitive Skills

'Meta' is a Greek term meaning behind or beyond, after (Zechmeister& Nyberg 1982). Cognition means a 'constant flow of information' (Langford, 1986). Metacognition is knowledge and consciousness of processes, and control of such knowledge and processes (Flavell et al., 1993). The main difference between the two terms cognition and Metacognition is that, Metacognition is the 'second order cognitions' (Kuhn &Weinert 2000). The concept of Metacognition was proposed by Flavell (1976) a developmental Psychologist, describe why children execute learning tasks in dissimilar ways.



Relationships between Cognition and Metacognition

Flavell (1976) defines Metacognitive Skills as 'one's knowledge concerning one's own cognitive processes and products, the active monitoring and consequential regulation of those processes in relation to the cognitive objects or data on which they bear. It is observed that modern studies propose the Metacognitive Skills under two main heading; Metacognitive knowledge and Metacognitive regulation. Metacognitive knowledge is the acquired knowledge about cognitive processes, which can be used to control cognitive process. Metacognitive regulation is the ability to use the acquired knowledge to control cognitive processes. Metacognitive regulation is the Metacognitive activities that help to control one's thinking or learning (Ozsoy, 2008).

Components of Metacognitive Skills

Declarative Knowledge

- The actual knowledge the learner wants before being able to use critical thinking related to the topic.
- Knowledge about what or that

Procedural Knowledge

- Awareness about how to implement learning processes.
- Knowledge about the process as well as when to apply process in various situations.

Conditional Knowledge

- The willpower under what circumstances particular processes or skill should transfer.
- Knowledge about why and when to use learning procedures.

Planning

- It includes the selection of appropriate plans and the distribution of resources that affect performance.
- Enables learner to predict the difficulty of the task.

Monitoring

- Refers to one's online awareness of task performance and comprehension.
- Involve in periodic self-testing while learning (Winnie, 1997).

Evaluation

- Refers to assessing the efficiency and product of one's learning (Schraw, 1998).
- Evaluates their performance on task and compare their performance with each other (Lucangeli, Cornoldi&Tellarini, 1998).

Information Management Strategy

- Strategy sequences and skills used to process information more efficiently and competently.
- Summarizing and selective focusing.

Debugging Strategies

• Strategies and techniques used to correct comprehension and performance errors on a learning episode.

Need and significance of the study

Several students fail to think about their thinking. They do not think about how

they think, that means they cannot control or regulate their information processing. Hence they fail to involve in "self-planning, self-monitoring, self-questioning, and selfregulating", that is necessary to learning and critical thinking. Students having good learning skills mean that they know how to plan, monitor, regulate, and control his own thinking. Education is the instrument which acts as the tool for any kind of learning. In the process of learning different subject are instructed to students. These entire subjects need a different kind of learning approach; learning Science need a deeper, creative, critical thinking and problem solving skills. One of the promising way by which Science can be learned meaningfully is by using Metacognitive Skills. In a class having mixed ability, the teacher is unable to bring about desirable modifications in each learner due to the limits of time, intelligence and size of the class. Transforming the Students into self- discovers of knowledge is the only solution for all these problems and here is the role and significance of Metacognition.

The aim of instruction is not to increase the amount of knowledge but to create the opportunities and possibilities of a child to invent and discover. "Teaching of Science should be based on objectivity, sensibility, inquisitiveness, creativity, and questioning spirit of students" (Duckworth, 1964). It should not be done in lecturing and discussing method only but should be organized in a problem solving and creative decision making environment. In the learning process, most of our children learn the concept blindly, without knowing the sense of it. Students are inactive recipients in the classroom and they lack mental operations. The mental abilities which are required for scientific observation, classification, problem solving, conceptualization, self-planning, self-monitoring and self-regulating are more or less neglected. It is in this context that the investigator felt the need for an effective strategy, the 7E Model that ensures more pupil participation. The investigator felt that 7E Model serves the demand for developing Metacognition as well as Science Process Skills. 7E Model provides methodology for acquiring skills through seven phases of teaching: Elicit. Engage, Explore, Explain, Elaborate, Evaluate and Extend. As students go through continuous series of all these phases they get a chance to self-experimenting, self-planning, selfmonitoring, writing reflective journal, developing concept maps and extending concept to new and unfamiliar situations. Thus they can boldly face the challenges of these learning skills of the 21st century.

Objectives

- 1. To compare the pretest and posttest scores on Metacognitive Skills of the students in the Experimental group.
- 2. To study the effect of 7E Model on Metacognitive Skills and its components among Secondary Students.

Hypotheses

There is significant effect of 7E Model on Metacognitive Skills with respect to existing Activity oriented Method and its components among Secondary Students of Kerala State.

Variable of the study

In this study there were two independent variables. They are instruction through 7E

Model and instruction by using existing method (Activity Oriented Method). Intelligence was taken as the extraneous variable. The dependent variable of the study was Metacognitive Skills.

Methodology of the Study

The investigator selected pretest posttest nonequivalent group design for the study. One of the group served as experimental group and other control group. 7E Model is applied to Experimental group and control group is instructed through Activity Oriented Method. The Metacognitive Skills was measured usingMetacognitive Assessment Inventory. After treatment both groups are compared using statistical analysis.

The investigator used the following tools during the different phase of the study. (i) MetacognitiveAssessment Inventory by Schrew and Dennison (1994).(ii) Lesson transcripts based on 7E Model and Existing Method (Activity Oriented Method) in Science prepared by the investigator.

The population of the present study covers all the pupils of secondary student s of Kerala State. The sample was selected by using purposive sampling. The investigator selected the Government Vocational Higher Secondary School Thidanad in Kottayam District for the selection of the sample for the present study. From the school the investigator selected two groups randomly as Experimental and Control consisting of 40 students each.

Descriptive statistics mean and Standard Deviation, Test of significance difference and inferential statistics ANCOVA were used for analyzing the data.

Analysis and Interpretation of the results

Objective 1: Comparison of the pretest and posttest scores on Metacognitive Skills of the students in the Experimental group.

Detailed description of the analysis is presented in Table 1.1. Results of the Test of Significance of Difference between the Pretest and Posttest Scores on Metacognitive Skills of the Students in the Experimental Group

Variables/	Test					
-	Pretest (N=40)	Posttest ((N=40)	- <i>l</i> -	<i>p</i> -
Components	Mean	SD	Mean	SD	- value	value
Information Process- ing	17.55	2.75	40.70	5.15	25.07*	.00
Debugging Strategy	11.25	2.32	21.40	2.73	17.95*	.00
Planning	14.40	2.45	29.00	3.61	21.17*	.00
Monitoring	13.85	2.33	28.53	4.19	19.35*	.00
Evaluation	11.33	1.76	24.98	4.35	18.38*	.00
Procedural Knowl- edge	9.33	1.93	17.06	1.82	18.50*	.00
Declarative Knowl- edge	11.60	1.71	31.15	3.37	32.72*	.00
Conditional Knowl- edge	10.50	1.52	21.50	3.23	19.47*	.00
Metacognitive Skills Total	99.80	4.85	210.12	25.43	26.94*	.00

N- Total number of Students SD- Standard Deviation *Significant at .05 level

From the Table 1.1, the obtained t values for the components of Metacognitive Skills namely, Information processing (t(39) =25.07, p < .05), Debugging Strategy(t(38) = 17.95, p < 0.05), Planning (t(39)21.17,p < .05), Monitoring(t(39) = 19.35, p <.05), Evaluation(t(39) = 18.38, p < .05), Procedural Knowledge (t(39)18.50, p <.05), Declarative Knowledge (t(39) = 32.72,p < .05), Conditional Knowledge(t(39) =19.47, p < .05) and the total scores on Metacognitive Skills (t(39) = 26.94, p <.05) are significant at .05 level. It is evident

that there is a significant difference between the means of the pretest and posttest scores on the components Information Processing, Debugging Strategy, Planning, Monitoring, Evaluation, Procedural Knowledge, Declarative Knowledge, and Conditional Knowledge and for the total scores on Metacognitive Skills of the students in the experimental group. It is clear that the means of the posttest scores of the students in the experimental group are higher than the means of the pretest scores for the Metacognitive Skills and its components. **Objective 2:** To study the effect of 7E Model on Metacognitive Skills and its component compared to Activity Oriented Method.

Table 1.2

Sum of Squares, Degrees of Freedom, Mean Square and F value for the Components of Metacognitive Skills

Component of Metacognitive Skills	SS	Df	MS	F- value	<i>p-</i> value
Information pro- cessing	18124.41	1	18124.41	648.33*	.000
Debugging strategy	1571.25	1	1571.25	284.90*	.000
Planning	6401.89	1	6409.81	471.13*	.000
Monitoring	158.01	1	158.01	14.69*	.000
Evaluation	101831.12	1	101831.12	1182*	.000
Procedural Knowl- edge	534.63	1	534.63	78.42*	.000
Declarative Knowl- edge	5532.22	1	5532.22	642.78*	.000
Conditional Knowl- edge	1082.24	1	1082.24	134.61*	.000
Metacognitive Skills Total	375216.52	1	375216.52	1114*	.000

Note: * p < .05; SS - Sum of squares; MS - Mean squares

Scores on Intelligence, Pretest scores on Metacognitive Skills are treated as covariates

Table 1.2 indicates that the calculated F values for the components, Information Processing (F(1,73) = 648.33, p < .05), Debugging Strategy (F(1,73) = 284.90, p < .05), Planning (F(1,73) = 471.13, p < .05) Monitoring (F(1,73) = 14.69, p < .05), Evaluation (F(1,73) = 1182, p < .05, Procedural Knowledge (F(1,73) = 78.42, p < .05), Declarative Knowledge (F(1,73) = 642.78, p < .05), Conditional Knowledge (F(1,73) = 134.61, p < .05), and Metacognitive Skills Total (F(1,73) = 1114,

p < .05), are significant at .05 level. Hence the investigator concludes that the 7E Model is more effective than Activity Oriented Method in developing the components of Metacognitive Skills.

Major finding of the study

There is significant effect of 7E Model when compared Activity Oriented Method on Metacognitive Skills and its componentsamong Secondary Students in Science Learning. Hence the investigator concludes that the 7E Model is more effective than Activity Oriented Method on Metacognitive Skills and its components.

Conclusion

7E Model enhance students' Metacognitive Skills and makes them able to use their prior knowledge as they gain new thought processes, develop higher levels of thinking, became known to their own reasoning and good self-regulative skills.It is found out that materials based on 7E learning model support significantly students' Metacognitive Knowledge and Metacognitive Regulation.Consequently, science curriculum planners, textbook setters and finally the teachers should be aware of the role of the 7E instructional model in science education.By obtaining Metacognitive Skills the learner develops confidence and become more independent learner.

Reference

- Best, J. W., & Khan, J. V. (2008). Research in Education. New Delhi: Prentice-Hall of India. Bloom, B.S (1956). Taxonomy of Educational Objectives Book/ Handbook/Cognitive Domain. Newyork: LongmanInv.
- Bevevino, M. M., Dengel, J. & Adams, K. (1999). Constructivist Theory in the Classroom. Internalizing Concepts through Inquiry Learning. The Clearing House: A Journal of Educational Strategies issues and Ideas, 72(5), 275-278.Retrieved from https://doi. org/10.1080/00098659909599406.

- Eisenkraft, A. (2003). Expanding the 5E Model. A Proposes 7E Model. Article retrived from www.scrip.org.
- Schraw, G. (1998). Promoting General Metacognitive Awareness. Instructional Science, 26(1),113-125. Retrieved from https://dio.org/ 10.1023/A:1003044231033
- Schraw, G., & Dennison, R. S. (1994). Assessing metacognition awareness. Contemporary Educational Psychology, 19, 460-475.
- Schraw, G., &Moshman, D. (1995), "Metacognitive Theories" Educational Psychology Papers and Publications. 40. Retrieved from http://digitalcommons.unl. edu/edpsychpapers/40
- Simon Philip., &Babu, R.N. (2008). Metacognitive Awareness of Teacher Trainees in Kerala. International Educator, 20(2), 19-21.

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A STUDY ON INFLUENCE OF EMOTIONAL MATURITY ON LEARNING AMONG HIGH SCHOOL STUDENTS

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Abstract

In the present study an attempt has been made to find out the influence of emotional maturity on learning especially among students of Standard nine of St. Joseph's GHS, Mutholy. A sample consisting of 25 students of standard IX was collected using survey method. Findings showed that majority of the students are emotionally matured. But a few of them have very low level of emotional maturity. Teachers as well as parents should take care to help them to develop emotional maturity. Because emotional maturity is an integral part of life and influences the personality of an individual.

Key words: Emotional maturity, Learning, Adolescents, Innate potentialities.

Introduction

Man is an individual born with certain innate potentialities, talents and inherent powers. Education is a process which draws out the best in man with the aim of producing a well-balanced personality- culturally refined, intellectually competent, technically advanced, morally upright, physically strong, socially efficient, spiritually mature, vocationally self-sufficient, and internationally liberal. Emotional maturity means the degree to which a person has realized his potential for richness of living and has developed his capacity to enjoy things to relate himself to others, to love and laugh, his capacity for whole hearted sorrow, when an occasion arises and his capacity to show fear when an occasion to be frightened, without feeling a need to use a false mask of courage, such as must be assumed by persons afraid to admit that they are afraid (Jerslid, 1963).

Review of Related Literature

Gakhar(2003)studied the relationship between emotional maturity and academic achievement of students at secondary stage and found a significant correlation

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between emotional maturity and academic achievement of boys and girls. Suman (2009) made a study and found that there were significant positive relationship between emotional competence & learning achievement among he students studying in secondary schools. Thukral, Praveen and Singh, Surjit (2010) made a study and found that there existed significant relationship between social maturity and academic achievement of high school students. Malliick Rinku, Singh Archana, Chaturvedi Poonam& Kumar Narendra (2014), conducted a study on Higher Secondary Student's Emotional Maturity and Achievement and found that there is no significant difference between government and aided higher secondary students with respect to level of emotional maturity and there is significant difference between day scholar and hostel stayinghigher secondary students with respect to level of emotional maturity.

Need for the Study

Emotions are of great significance in our life. Sometimes due to some emotion, we do things beyond our imagination. Emotions inspire us. Man is a social being; he therefore cannot be free from emotions. A successful life demands a harmony of emotions. Through education, attempt may be made to attain some control over them. Emotional maturity means, in essence controlling our behaviour rather than allowing our behaviour and emotion to control us. In this modern age the role of teachers is constantly changing because of social and economic changes. She must help students to attain emotional maturity. Emotional maturity lies on a person's thoughts and behaviour and makes

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a person flexible, adaptive and responsible (Khushwinder Kumar, 2011).

Objectives of the Study

- To study emotional maturity among high school students of St. Joseph's GHS, Mutholy.
- 2. To find out how emotional maturity influence the classroom behaviour of students.
- 3. To analyse the influence of emotional maturity on learning among high school students.

Methodology

A survey was conducted in St. Joseph's GHS, Mutholy with the help of questionnaire in standard IX B for 25 students. The tool used for the study is the influence of emotional maturity on learning among high school students. So, it helps to reveal the emotional maturity of high school students.

Tool Used

The standardised tool for studying the influence of emotional maturity on learning among high school students consisted of 20 questions. It helps to measure the emotional maturity of the students. Each question in the tool has two answers 'Yes' or 'No'. If a particular statement is true, the students 'Yes' otherwise, answer is 'No'. An individual takes about 20 minutes for the completion of the test.

Analysis And Interpretation

Objective 1: To study emotional maturity among high school students of St.Joseph's GHS, Mutholy.

Frequency distribution of respondents

Table 1

	Opinion	No. of	Percentage
		respondents	
1	Yes	5	20
2	No	20	80
Total		25	100

The above table shows that 20% of respondents cry after mild scolding while 80% do not cry after mild scolding.



Graph showing percentage distribution of respondents

Objective 2: To find out how emotional maturity influence classroom behaviour of students.

Table 2

Frequency distribution of respondents

	Opinion	No. of respondents	Percentage
1	Yes	18	72
2	No	7	28
	Total	25	100

It is clear from the table above that, 72% of students keep discipline in the class even in the absence of teacher while 28% does not maintain discipline even in the absence of teacher.



Figure 2 Graph showing percentage distribution of respondents

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Objective 3: To analyse the influence of emotional maturity on learning among high school students.

Table 3

Frequency distribution of respondents

	Opinion	No. of respondents	Percentage
1	Yes	5	2
2	No	20	98
	Total	25	100

About, 98% of respondents are not afraid of exams while 2% are afraid of exams.



Figure 3

Graph showing percentage distribution of respondents

Frequency distribution of respondents

Table 4



The above table clearly depicts that about 12%do not bother too much about their studies or future life while 88% of students does not take life easy and bother too much their studies or future life.



Figure 4

Graph showing percentage distribution of respondents

Findings of the Study

The following are the major findings of the study:-

- 80% of respondents do not cry after mild scolding while 20% cries.
- 72% of respondents keep discipline in the class even in the absence of the teacher..
- 98% of the students are not afraid of writing exams.
- 88% of the students bother too much about studies or future life while 12% of them do not bother too much.

Suggestions

The curriculum should include the content and activities that help to improve the emotional maturity among students. Teachers also must supplement books that help to increase emotional maturity of the students. The schools should organise special counselling programs for the students. Above all, the schools and homes must provide an environment that leads to proper emotional development of students.

Conclusion

Emotional maturity refers to the capability to understand and manage emotions. When faced with a complex situation, the level of emotional maturity is one of the biggest factors in determining ability to cope with the situations.Education is the process of development from child to adolescence or adulthood. Emotional maturity is an integral part of life and is characterized by the ability to become in a state of balanced feeling and self-control. The schools play an important role in the development of emotional maturity of students and must help students to achieve proper emotional development.

References

- Gakhar, S.C. (2003), A study of Emotional Maturity of students at secondary stage, selfconcept and academic achievement. Paper published in Journal of Indian Education. Vol.XXIX, No.3, New Delhi: NCERT. Pp100-106.
- Jerslid, A T (1963) The psychology of adolescents, The Macmillan Company.
- Khushwinder Kumar, 2011 Emotional maturity, Self-confidence and Academic achievement of students, 188-193.

- MalliickRinku, Singh Archana, ChaturvediPoonam& Kumar Narendra (2014), "A Study on Higher Secondary Students Emotional Maturity and Achievement". International Journal of Research & Development in Technology and Management Science Kalish, ISBN-978-1-63102-445-0, Vol-21, Issue-1.
- Thukral, Praveen and Singh Surjit (2010), "Social Maturity and Academic Achievement of High School Students". Canadian Journal of Scientific and Industrial Research, Vol.1, No.1, pp.6-9.

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CALCULATION ERRORS IN ALGEBRAIC COMPUTATIONS OF SECONDARY SCHOOL STUDENTS

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Abstract

Errors are common in human life. Mathematical errors are mainly due to failure in perceiving simple and basic mathematical operations. The present study is on calculation errors in algebraic computations of secondary school students. The tool 'A test to detect the errors in algebraic computations' was constructed by the investigators to detect calculationerrors in algebraic computation of secondary school students and was administered among 63 students. Most of the errors were due to lack of knowledge about equations and identities.

Key Words: Algebra, Mathematics Computation, Errors

Introduction

Mathematics can be seen in every segment of the world. One can find mathematics in every rhythm of life. It is a contributing factor in rapid progress and prosperity of mankind. The National Policy on Education(NPE, 1986) has emphasized the importance of mathematics education. Paragraph 8.17 of the NPE states that, Mathematics should be visualised as the vehicle to train a child to think, reason, analyse and to articulate logically.Students start to learn the language of numbers right from the very beginning of their schooling. From the simple 1+1=2, they start developing the understanding about this complex world and its processes. But this is not easy for everyone. Some students are good in the subject at the initial levels of their life, but as the subject starts heading towards its complexity, it becomes difficult and boring for them. They fail to perceive simple and basic mathematical operations. Such students, as they reach secondary level lose their interest and start fearing the subject. It is believed that mathematics is an exceptionally difficult subject and hence its study requires special ability and intelligence.

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In the report of the Education Commission (1964-66) it is recommended that Sciences and Mathematics should be taught on the compulsory basis to all pupils as a part of general education during the first ten vears of schooling. The fear of mathematics compels some students to hate schooling and thereby increase the dropout. То achieve the recommendations of Education Commission and the dreams of our society it is important to make mathematics learning easy, interesting and meaningful to our students. The identification and correction of the mistakes/errors that students committed in mathematical computations is one of the steps to move towards the target. Ramaaand Gowramma(2002) revealed that, in order to help the students having difficulty in mathematics, there is an immediate need to identify children who have difficulties in mathematics and to diagnose their difficulties at the symptomatic level and understanding their causative and correlative factor.

Need and Significance of the study

Algebra is considered as very important branch of Mathematics. The demand for algebra at more levels of education is increasing. WikiAnswers (2010), one of the world's leading questions and answers websites, lists some of the uses of algebra in today's world. The fundamental necessity for the teaching of Algebra is to give training in analysis and expression. Inspire of its utility it is commonly found that pupils show a kind of aversion to Mathematics and Algebra in particular. Many are of the opinion that learning Algebra is more difficult than learning arithmetic. One of the chief functions of the Mathematics teacher is to discover difficulties experienced by the pupils in learning and applying concepts in Algebra and to overcome the difficulties. Mathematical errors can be classified as calculation errors, procedural errors and symbolic errors. Madan Mohan(1990, as cited in Augustine, 2006) identified a few major mistakes committed in the performance of students in mathematics. They are mathematisation of verbal problems, interpretation of mathematical results and learning new topics. These occur in algebraic computations also. Algebraic computation refers to the fundamental operations in algebra, namely, addition, subtraction, multiplication and division. Beginners in algebra make mistakes while doing problems. Egodawatte (2011) identified that student errors pertain to four main areas in algebra: variables, expressions, equations and word problems. Also the misuse and misunderstanding of rules, confusion with previously learned concepts, not identifying arithmetic algebraic connections, etc was prominent. The investigators also have come across withsome errors which are usually committed by students while solving problems. The following is a list of some common errors made by students that identified by the investigators from their experiences and literature.

Commonly occurring Calculation errors:

- Errors due to ignorance about the concept of 'zero'.
- Errors related to LCM.
- Errors related to subtracting fractions.
- Errors in converting fractions like mixed to improper and finding reciprocals.
- Errors in borrowing numbers.
- Errors in combination.

- Errors due to brackets.
- Errors due to unfamiliar notations.
- Errors due to lack of knowledge about equations and identities.
- Errors due to factorisation of expressions.
- Errors due to wrong use of symbols.
- Errors due to sign convention.
- Errors due to lack of acquaintance in mathematics language.
- Errors due to squaring.
- Errors due to indices.
- Errors due to substitution.
- Errors due to mathematisation of verbal problems.
- Errors due to lack of knowledge in BODMAS principle.

Realising the importance of mathematics, especially algebra it is necessary to understand the areas in which students have high tendency to commit errors. Some of the advantages of identifying errors committed by students are:

Advantages

- Enables teacher to know progress of the learner.
- Teacher can understand the difficulties of the child and can give remedial measures.
- Teachers can improve the achievement of students in mathematics and develop interest.
- Helps teachers, students and parents to understand factors affecting learning and improve the level of motivation given.
- Highlights the strategies or procedures employed by the learners.
- Helps higher learning in all other subjects and branches.

Hence gaining proficiency in computations and calculations especially on fundamental operations is a must. But students are often confused with sign convention, unfamiliar notations, use of symbolic representations, converting statements into equations, etc. There are a considerable number of studies on students' errors in computations using fundamental operations. Few studies address to the issue of errors in algebraic computations. Hence there is a need to study the common errors. Since learning of algebra is started and covered during the secondary level, the most suitable stage for this is the secondary level.

Objectives of the study

- To study the calculation errors committed by the students of secondary school in algebraic computations.
- To identify the most frequently committed calculationerrors in algebraic computations by secondary school students.
- To determine whether there exist any difference in the calculation errors committed in algebraic computation by boys and girls of secondary school.

Null Hypothesis

H01: There is no significant difference between the means of calculation error scores in algebraic computation of boys and girls.

Method used

This study is a descriptive survey to identify the errors in algebraic computation committed by the secondary school students.

Sample

The study was conducted in SMV Higher Secondary School, Poonjar in

Kottayam district. The sample consists of 32 students from class VIII and 31 students from class IX. There were a total of 28 boys and 35 girls.

Tool Used

After determining commonly occurred errors in algebraic computations committed by secondary school students, "A test to detect the errors in algebraic computations" was constructed by the investigators . Fifteen types of errors were selected for the preparation of test items. There were fifteen questions considering the major content areas, namely, negative numbers, elementary algebra, exponents and algebraic expressions. Each wrong answer has given a weightage of one score.

Analysis and Interpretation

Objective 1

To discuss the first objective the investigators collected calculation error scores with the tool "A test to detect the errors in algebraic computations". The scores are arranged as frequency distribution table and calculated descriptive statistics, mean and standard deviation. Table 1 shows the frequency distribution and Table 2 describes the descriptive statistics.

Table 1

Distribution of calculation error scores in algebraic computation of secondary school students

Class Intervals	Frequency		
Class line vais	Boys	Girls	Total
1 – 3	-	1	1
4 - 6	-	-	-

7 - 9	2	5	7
10 - 12	13	13	26
13 - 15	13	16	29
Total	28	35	63

Table 2

Mean and standard deviation of calculationerror score of secondary school students

Variables	Size	Mean	Standard Deviation
Boys	28	12.25	1.99
Girls	35	11.7	2.92

From Tables 1 and 2 it is clear that the secondary school students are committing number of calculation errors while solving problems (90% of the total students have calculation error score ≥ 10). There is slight difference between the mean scores of boys and girls. The mean value of the calculation error score of boys(12.25) is greater than girls(11.7).

Objective 2

To analyse the second objective the investigators thoroughly studied the nature of errors committed in each answers of the response sheet and find out the frequencies of each type. Table 3 shows the nature, and frequencies of errors committed by boys and girls in the test to detect errors in algebraic computations: Table 3

Nature and the frequencies of calculation errors committed by boys and girls in the test to detect errors in algebraic computations

Errors	Boys	Girls	Total
Error due to ignorance about the concept 'zero'	13	13	26
Error related to LCM	23	19	42
Error in converting fractions	47	52	99
Errors in combination.	28	35	63
Errors due to brackets.	42	47	89
Errors due to unfamiliar notations.	29	33	62
Errors due to lack of knowledge about equations and identities.	60	76	136
Errors due to wrong use of symbols.	2	12	14
Errors due to sign convention.	43	54	97
Errors due to lack of acquaintance in mathematics language.	50	61	11
Errors due to squaring.	36	34	70
Errors due to indices.	16	23	39
Errors due to substitution.	18	22	40
Errors due to mathematisation of verbal problems.	14	16	30
Errors due to lack of knowledge in BODMAS principle.	14	15	29

Table 3 reveals that majority of the errors were due to lack of knowledge about equations and identities and it was more prominent among girls than boys. Also a considerable number of errors were due to lack of acquaintance in mathematics language. Errors due to sign convention and converting fractions were also prominent. Boys and girls were equally found to be ignorant about the concept of 'zero'.

Objective 3

To analyse the third objective the investigators formulated the following null hypothesis

H01: There is no significant difference between the means of calculation error scores in algebraic computation of boys and girls. The null hypothesis H01was tested using the statistical technique two tailed test of significance of difference between means for independent groups The level of significance was fixed at .05 with degrees of freedom 61. The Table 4 gives the estimated result Table 4

Statistical analysis of means of calculation error scores in algebraic computation of boys and girls

variables	Ν	df	Mean	SD	SEM	SED	t
Boys	28	27	12.25	1.99	0.38	0.649	0.944
Girls	35	34	11.7	2.92	0.49	0.048	0.044

N-Sample size, df-Degrees of freedom, SD-Standard Deviation,, SEM-Standard Error of Mean, SED-Standard Error of Difference, t-Critical Ratio,

From Table 4 it is evident that there is no significant difference between the means(not significant at .05 level) of calculation error score on algebraic computation of boys and girls of secondary schools. There is no gender difference in committing calculation errors on algebraic computation.

Findings

- The secondary school students commit a lot of calculation errors while doing algebraic computations.
- The most frequently occurred calculation errors were due to lack of knowledge about equations and identities.
- The least committed calculation error was errors due to wrong use of symbols
- There exist no significant differences in the calculation errors committed in algebraic computation by boys and girls of secondary school.

Recommendations

- Students should be given clear idea in basic operations using algebra.
- Teachers should concretise ideas like variable, coefficient, etc, through real life examples and with the support of technological aids. .
- Teachers must use and explain mathematical terms and vocabulary in classroom.

• Tests should be conducted occasionally to identify difficulties and errors and provide appropriate remedial measures.

Conclusion

It is evident from the study that there is a considerably high tendency among secondary school students in committing Calculation errors during algebraic computations. Therefore it is necessary to take necessary steps to bring down this tendency. For that, teachers should be aware of the different types of errors committed by students and its causes. Teachers should also think about different techniques to identify such errors and develop methods of teaching which help students to minimize such calculation errors. Techniques like peer tutoring can also be used so that students feel free to express their difficulty. Above all the teacher should provide mental, physical and emotional support which will motivate and light up the students' confidence level.

References

- Allchin, D (2001). Error types, Perspective on Science, Perspectives on Science, 9(1), 38-58
- Allchin.D(1999). 'Negative results on positive knowledge'. Marine Ecology Progress series.
- Augustine, H (2006). 'A study on the common errors in algebraic computations of the

secondary school students'.Mahatma Gandhi University, Kottayam.

Donald, Mc, B. (2010). Mathematical misconceptions, Lambert Academic Publishing.

Education Commission (1964-66)

Egodawatte, G.(2011). Secondary School Students' Misconceptions in Algebra by, retrieved from https://tspace.library.utoronto. ca.

Madan Mohan(1990)

- Mathew, B. (1998). 'A Study on the factors affecting errors in arithmetic computation of sixth standard students'. Mangalore University, Mangalore.
- National Policy on Education (1986), "Ministry of Human Resource Development." Government of India.

St. Thomas College of Teacher Education, Pala, Kerala

- Ramaa and Gowramma (2002). Difficulties in Arithmetic problem solving, Indian Education Review, NCERT,New Delhi,38(1), 69-85
- retrieved from https://www.mitpressjournals.org/ doi/10.1162/10636140152947786
- Veloo1 A., Krishnasamy, N. H., & Wan Abdullah, W. S.(2015). Types of Student Errors in Mathematical Symbols, Graphs and Problem-Solving, Asian Social Science, 11(15), retrieved from https://www. ccsenet.org>ass>article.
- WikiAnswers (2010). What is the importance of algebra in today's world? Retrieved fromhttp://wiki.answers.com/Q/What_is_ the_importance_of_algebra_in_today's_ world.

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SCIENCE PROCESS SKILLS AMONG SECONDARY SCHOOL STUDENTS

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Abstract

Science education opens the wide door for applying the principles, theories and concepts to the immediate environment and makes it more suitable for living. Learning science develops proficiency in certain process competencies which are called process skills. The science process skills form the foundation for scientific methods, through which we can systematically gather information about the natural world. The increasing value of science process skills poses a serious challenge of finding ways to amend teaching as a means of elevating these educational outcomes. The present study is a descriptive survey study. In this study the investigator tries to measure science process skills among secondary school students. A tool named "Test on science process skills" prepared and validated by Bindu and Neethu (2007) was adapted for the study. It was administered among 45 students. The difference between the means of scores on science process skills among boys and girls in the sample was estimated and it was not significant at .05 level.

Key words: Science process skills, basic process skills, integrated process skills, drawing inference, hypothesising, classifying, etc

Introduction

Science forms a basic part of the human experience. It is a body of knowledge, a way of investigation, a way of thinking and an attitude towards life. One important approach to teaching children is to develop a classroom environment that encourages children to make discoveries. For this, children can learn and use a number of investigative procedures commonly referred to as the process of science. There are three dimensions of science that are all important. They are the content of science, processes of doing science and scientific attitudes. The science process skills form the foundation for scientific methods, through which we can systematically gather information about the natural world. The goal of science education is to develop students' skills and enables individuals and to apply those

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skills in everyday lives(Panoy, 2013). These skills affect the personal, social, and global life of individuals. Science Process Skills are necessary tool to produce scientific information, to perform scientific research and to solve problems. The increasing value of science process skills poses a serious challenge of assessing the level of these skills that children possess and finding ways to amend teaching as a means of elevating these educational outcomes. The present study aims at the assessment of science process skills among Secondary School Students.

Science Process Skills

Science process skills are the things that scientists do when they study and investigate. Observing, classifying, communicating, measuring, inferring and predicting are among the thinking skills used by scientists, teachers and students when doing science. Much of the pleasure of both learning and teaching science is experiencing science. Mastering these process skills will help use develop the kind of science program that mirrors real science (Rezba, et al., 1995)

Understanding of Science process usually refers to skills or abilities that must be owned by the scientists on the process of scientific discovery. These skills are divided into two groups: basic and integrated process skills. The basic process skills include observing, asking questions, classifying, measuring and predicting. Integrated process skills include, identifying and defining variables, interpreting data, manipulating materials, recording data, formulating hypotheses, designing investigations, making inferences and genralizations. The basic science process skills are what people do when they do science. Children using the same skills are active learners. They use their senses to observe objects and events and they look for patterns in those observations. They classify to form new concepts by searching for similarities and differences. Orally and in writing, they communicate what they know and what are they able to do. To quantify descriptions of objects of objects and events, they measure. They infer explanations and willingly change their inferences as new in formations become available. And they predict possible outcomes before they are actually observed.

Science process skills form the core of inquiry-based learning. To learn to do science is to master the science process skills and to apply them in scientific investigation (Ngoh, 2008).

Need and Significance of the Study

The slogan 'Science for all' has become popular now a days. Science Education aims to train students to think like scientists and emphasis would be expected on the development of attitude that good scientists are able to display (Opulencia, 2011). One of the purpose of teaching is inculcation of desirable attitudes and values (Pacia, 2014). Shaping students' attitudes, behaviors, and motivations is necessary today for without these broader skills and strengths, students will be unprepared for the challenges they, and their world, will face (Miller, 2017). Development of basic process skills is important as well as development of proper scientific attitude and values. Recent revitalization of interest in developing thinking skills has encouraged added importance on process skills instruction.

The purpose of science education is to enable individuals to use scientific process skills; in other words, to be able to define the problems around them, to observe, to analyze, to hypothesize, to experiment, to conclude, to generalize, and to apply the information they have with the necessary skills. Scientific process skills (SPS) include skills that every individual could use in each step of his/her daily life by being scientifically literate and increasing the quality and standard of life by comprehending the nature of science. Therefore, these skills affect the personal, social, and global lifes of individuals. The SPS are a necessary tool to produce and use scientific information, to perform scientific research, and to solve problems.

Numerous research projects have focused on the teaching and acquisition of basic process skills. For example, Padilla, Cronin, and Twist (1985) surveyed the basic process skills of 700 middle school students with no special process skill training. They found that only 10% of the students scored above 90% correct, even at the eighth grade level. Several researchers have found that teaching increases levels of skill performance.

Science is more than of scientific knowledge. Science process skills should be used as benchmark in planning lessons, however science process skills should not be presented as separate stand-alone lesson. These skills need to be connected with important concepts. Thus, Science knowledge serves as a background for lessons but should not take up the main lesson. Instead, more emphasis must be given on activities that enhance the understanding of science concepts and improve science process skills. This implies that process skills work hard with the scientific knowledge and scientific attitudes to help students to think systematically

Science process skills as the building blocks from which suitable science tasks are being constructed must be considered by the new national science curricula and the way they are expressed in textbooks. To develop science process skills, science content taught in science classrooms should be used (Nyakiti et al, 2010)

According to Johnston (2009), scienceprocess skills are significant in improving students' cognitive development andfacilitating students' active participation during the teaching and learning process.

Today's society shows tremendous progress by fast advancing technology with its outpouring information. Processing of information to make life more convenient is seen in every walk of life. The ability to perform science process in students is an asset to the national development and they would contribute much to the demand and essential to the society. Hence it is very essential to study about process skill because the science classes which conjures magical moment's boosts the natural curiosity and quest of children and they seems to be scientists at heart. As the educational process has now shifted to a process approach, it is essential to find the acquisition of the process skills which are the necessary attribute for the development of an individual the scientific path of investigating things.

Objectives of the Study

- To study the distribution of Science process skills among the Students of Standard Ten of Secondary Schools.
- To find out the significant difference if any in Thinking Skills among the Boys and Girls of Standard Ten of Secondary Schools.

Hypothesis of the Study

• There is a significant difference between the Means of scores on Science process skills among the Boys and Girls of Standard Ten of Secondary Schools.

Methodology of the Study

The research study was a Descriptive Survey. The investigator carried out the research study in three phases. The first phase included the selections of variables involved in the study and the formulation of the hypotheses. The second phase included the selection of the tool titled "Test on Science Process Skills". It also included Selection of sample and Data collection. In the third phase investigator analysed the data.

Sample for the Study

The study was conducted in St.Joseph's H.S, Manathoor in Kottayam district. The sample consists of 45 students from Standard Ten. There were 22 boys and 23 girls.

Tool used and Scoring

For the present study, a tool named "Test on science process skills" developed and validated by the Bindu and Neethu (2007) was used. The test measures three science process skills namely skill of classification, skill of drawing inference and skill of formulating hypothesis. There were a total of 30 questions. The score allotted to each question was one.

Analysis and findings

Analysis and Interpretation of the Distribution of science process skills

The first objective of the study was to study the distribution of science process skills among the Students of Standard Ten of Secondary Schools of Kottayam District. The investigator collected the data pertaining to this objective by administering the tool titled 'Test on Science Process Skills' to the students of Standard Ten. The maximum score which could be obtained on the test was 30. Table 1 gives the frequency distribution of the scores on Intelligence.

Table 1

The Frequency Distribution of Scores on Science Process Skills

Class Interval	Frequency
0-5	0
6-10	3
11-15	4
16-20	18
21-25	14
26-30	6
Total	45

Table 1 shows that all the cases fall within the range 6 to 30 and there are a few cases at the lower end. The highest frequency is 18 and it falls in the class 16-20. The next higher frequency is 14 and it falls in the class 21-25. The highest possible class is 26-30 and the corresponding frequency is 6. The investigator calculated the Mean, median, mode, and Standard Deviation of the scores on the total sample. The Number, Mean and Standard Deviation of the scores on science process skills are presented in the Table 2.

Table 2

The Number, Mean, Median, Mode and SD of the Scores on Science Process Skills

Variable	Number	Mean	Median	Mode	SD
Science process skills	45	19.38	19.00	19.00	4.69

The table 2 shows that the means of the scores on science process skills is 19.38. The obtained median value and mode of the scores is 19. Based on the mean and Standard Deviation of the scores obtained

on science process skills the whole sample was classified into three categories namely below average, average, and above average groups. The distribution of students in the total sample is presented in Table 3.

Table 3

Classification of students based on the mean and Standard Deviation

Process Skills	Range	No of students	Percentage
Below average	Below М-б (14.69)	6	13.33
Average	М- б to М+ б (14.69- 24.07)	33	73.34
Above average	Above M+ σ (24.07)	6	13.33

The classification of students among the total sample based on the mean and Standard Deviation revealed that only few students possess high and low level of science process skills. They are only 13.33% each. Remaining 73.34% of the students have average acquisition of the selected science process skills.

Analysis and Interpretation of the Difference in science process skills with respect to Gender

The second objective of the study was to find out the significant difference if any in science process skills among the Boys and Girls of Standard Ten of Secondary Schools. The investigator analysed and interpreted the data using Inferential Statistics namely the test of significance of difference between two independent groups. The level of significance was fixed at .05 (probability of Type I error) with degrees of freedom 43.

For this the investigator formulated the following null hypothesis which is stated as "There is no significant difference between the Means of scores on science process skills among the Boys and Girls of Standard Ten of Secondary Schools". The investigator gives the detailed description of the analysis in Table 4.

Table 4

Results of the	Test of Significance	of Difference	between the	Scores of	n science	process.	skills
with respect to	o Gender						

Variable	Gender	Number	Mean	SD	t-value	df	p-value
A 1	Boy	22	20.36	4.80	1 205	12	705
Attitude	Girl	23	18.43	4.47	1.393	45	.703

From Table 4, the investigator observes that the obtained t value for science process skills (t(37) = 1.395, p > .05), is not significant at.05 level. From this, it is clear that there is no significant difference between the means of the scores on science process skills of boys and girls.Hence, the null hypothesiswhich states that, 'There is no significant difference between the Means of scores on science process skills among the Boys and Girls of Standard Ten of Secondary Schools', is accepted. Therefore, the investigator concluded that there is no significant difference between boys and girls with respect to the scores on science process skills.

Major Finding of the study

There is no significant difference between the Means of scores on Thinking skills among the Boys and Girls of Standard Ten of secondary schools.

Conclusion

A reasonable portion of the science curriculum should emphasize science process skills according to the National Science Teachers Association. In general, the research literature indicates that when science process skills are a specific planned outcome of a science program, those skills can be learned by students. Teachers need to select curricula which emphasize science process skills. In addition they need to capitalize on opportunities in the activities normally done in the classroom. Though not an easy solution to implement, the explicit teaching of process skills remains the best available at this time.

References

- Allen, L. (1973). An examination of the ability of third grade children from the Science Curriculum Improvement Study to identify experimental variables and to recognize change. Science Education, 57, 123-151.
- Bindu, D. and Neethu, J. (2007)."A study on the selected Science Process Skills and Creativity of the students of Standard Nine of Ernakulum District". Unpublished M.Ed Dissertation, M.G.University
- Deborah E. Burns, JannLeppien, Stuart Omdal, E. Jean Gubbins, Lisa Muller (2006). SiamakVahidi Teachers' Guide for the Explicit Teaching of Thinking Skills, RM06218, The National Research Center on the Gifted and Talented, University of Connecticut, 2131 Hillside Road Unit 3007, Storrs, CT 06269-3007
- file:///C:/Users/LIB2/Desktop/200712TorresHan doutParentNSTAConn.pdf
- file:///C:/Users/LIB2/Desktop/327Set9a_ Reasoning.pdf

https://files.eric.ed.gov/fulltext/ED579181.pdf

Johnston, J. S. (2009). What does the skill of observation look like in young children?
International Journal of Science Education, 31(18), 2511 – 2525.)

- Miller, R.K. (2017). Building on Math and Science: The New Essential Skills forthe 21st-Century Engineer: Solving the Problems of the 21st Century. Industrial Research Institute Inc. Retrieved from http://www.iriweb.org
- Ngoh, T.J. (2008). Mastery of Science Process Skills. Kuala Lumpur Malaysia http:// www.longwood.edu/cleanva/images/sec6. processskills.pdf
- Nyakiti, C. Mwangi, J. &Koyier, C. (2010). Mastering PTE Science.Oxford University Press, Nairobi,
- Opulencia, L.M. (2011). Correlates of Science Achievement Among Grade-VI Pupils In Selected Elementary Schools San Francisco District, Division of San Pablo City. Laguna State Polytechnic University
- Pacia, R. D. (2014). Teacher-Centered and Student- Focused Approaches in Learning High School Physics. Master's Thesis. Laguna State Polytechnic University, San Pablo City Laguna

- Padilla, M., Cronin, L., &Twiest, M. (1985).The development and validation of the test of basic process skills. Paper presented at the annual meeting of the National Association for Research in Science Teaching, French Lick, IN.
- Panoy, B.R.P. (2013). Differentiated Strategy in Teaching and Skills Development of Pupils in Elementary Science.Master's Thesis. Laguna State Polytechnic University, San Pablo City Laguna
- Rauf R.A.A. et al. (2013).Inculcation of Science Process Skills in a Science Classroom.Asian Social Science, Vol. 9, No. 8; 2013 ISSN 1911-2017.E-ISSN 1911-2025 Published by Canadian Center of Science andEducation
- Rezba, et al. (1995).Learning and Assessing Science Process Skills. Kendall/Hunt
- University Press, Nairobi,

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IDENTIFICATION OF MISCONCEPTIONS IN PHYSICS USING SEMI – STRUCTURED INTERVIEW GUIDE

Reshmi K.S.* Dr.(Sr.) Celene Joseph**

Abstract

This article is on the preparation of a Semi-structured Interview Guide and the identification Misconceptions using it among students of standard ten in selected areas of Physics. Today, the classroom learning has shifted its focus from learner-centered to learner-driven classrooms which demands active involvement from the part of the students. The students come to classrooms with a lot of ideas about the topics they are going to study. Some of these pre-occupied ideas are Misconceptions. Misconceptions possessed by students are barriers in learning as it is based on the existing knowledge of the learner and the learning situations provided. If the learner comes to class with erroneous knowledge, it will be a barrier to the correct concept formation. So, the identification of the prior knowledge of the learner is an important factor in the teaching-learning process. After identifying the preconceptions of the learner regarding the topic to be learnt, the teacher can take necessary steps to bridge the gap so that the students easily generate new correct knowledge. The objective of the present study is to prepare a Semi-structured Interview Guide to identify the misconceptions that exist among students of standard ten in selected content areas of Physics and to identify the Misconceptions using it.

Key words: misconceptions, misconception identification, semi-structured interview guide.

Introduction

A student in Physics must be moulded to be a responsible citizen, to develop an understanding of the world around and to enrich the life of the people whom he/ she is associated with. The objective of teaching and learning of Physics is to

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develop understanding of the basic concepts and application of principles in Physics. In addition, the teaching of Physics should train the young mind, develop skills needed to face the challenges of life and infuse right attitudes in youngsters. It should also promote the learners to observe, think logically, to draw conclusions and to make the right decisions, because in future they will be faced with new situations, circumstances and problems which require critical analysis and discussion with colleagues before reaching the final right decision. It is to this end that the education and training of a Physics student should be directed.

Physics teachers need to teach the essentials of Physics and encourage the learners to experience the excitement and fascination of learning Physics. They should also educate the students for performing the variety of roles and activities necessary for active participation and leadership in society.

Need and Significance of the Study

The students come to the classroom with a lot of ideas from various sources. The learning depends on the prior knowledge that the student possess. If the prior knowledge is inaccurate, it hampers the learning process or end in erroneous learning. Thus the erroneous or incorrect knowledge, usually termed as Misconceptions should be identified along with the prior knowledge, before starting the instruction. Though the students possess Misconceptions, it is not normally identified and addressed in ordinary classes. As a result, the purpose of the teaching fails to meet the anticipated goal, irrespective of the strategy employed.

Understanding of science takes place

when the students realise that their views are inconsistent with the accepted facts. The quality of understanding is determined by three essential factors - the ability to see relationships, the ability to comprehend the underlying meanings and the ability to reason. Usually learners' concept formation is characterized by certain factors like individualization, pattern, hierarchical, development from undefined to specific and from specific to general, emotionally weighted, frequently resistant to changes. The conceptual framework thus formed influences the quality of behaviour.

Hurlock (2008) outlines that the major hazards in the correct concept formation are (i) developmental lag in understanding (ii) Misconceptions and (iii) barriers in changing Misconceptions. Lucariello and Naff (1997) termed the students' the erroneous, illogical or misinformed pre-instructional knowledge as alternative conceptions or Misconceptions. Misconceptions are faulty interpretations of different sensory experiences. When these experiences are associated with wrong meanings, it may give rise to faulty concepts. Hurlock, (2001) hypothesizes the major causes of Misconceptions as incorrect information, limited experience, gullibility, faulty reasoning, vivid imagination, unrealistic thinking and misunderstanding of words and confusion.

The Misconceptions may be shortterm or long lasting. When the child gains information over years, the cognitive aspect of a concept can be changed but the affective aspect of emotional weighing is likely to persist. Thus the child finds difficulty in changing the Misconceptions and it continues to affect cognitive adjustments unfavourably.

The students' mind is occupied with some pre-instructional knowledge about the topic to be taught when they come to the classroom. Therefore, assessing learning before and after teaching is equally important. Prior assessment helps the teacher (i) to find the previous knowledge the students possess, (ii) to check whether the student have essential pre-requisite knowledge needed to learn the new concept and (iii) to identify the common Misconceptions that may interfere with the learning process.

Burgoon, Heddle and Duran (2010) argue that 'certain ideas developed by students may not match the most current confirmation. Additionally, some science concepts may be difficult to grasp. Hence, its understanding may be blemished. In this way, even adults, including teachers may sometimes maintain Misconceptions'. The presence of any form of Misconception can hamper the learning process. Since, Misconceptions tend to be resistant to instruction, teachers are put in a challenging position to bring about significant, needful conceptual change in the student. For the formation of correct concepts, Misconceptions has to be identified.

Studies Related to Misconceptions

As the students come to formal learning environment with various Misconceptions (Gilbert & Watts, 1983), many of the research studies during 1970s addressed on (i) what the students learn (ii) the difficulties the students faced in grasping fundamental concepts and (iii) the variation of students concepts from that of the scientists. The studies reported on the development

of various tools for the identification and categorisation of Misconceptions were (i) Interview (Fisher, 1985) and (ii) Two tier diagnostic test (Haslam & Treagust, 1987; Odom & Barrow, 1995). Of the various strategies and tools used for revealing Misconceptions, it was reported that diagnostic questions (Kaewkhong, Mazzolini, Emarat, & Arayathanitkul, 2009), concept mapping (Djanette & Fouad, 2014), questionnaire (Alwan, 2014), closed questionnaire (Blizak, Chafiqi & Kendil, 2009), diagnostic questions (Kaewkhong, Mazzolini, Emarat, & Arayathanitkul, 2009), online instrument of statements (Stein, Larrabee& Barman ,2008), twotired test questions, open-ended questions and interview (Sahin, Ipek & Ayas, 2008), concept mapping through interviewing technique (Liu, Lin, & Tsai, 2009) are effective in revealing Misconceptions.

Objectives of the Study

The study was intended (i) to prepare a Semi-structured Interview Guide to identify the Misconceptions of the students of Standard ten regarding the selected areas and (ii) to identify the Misconceptions of the students of Standard ten regarding the selected areas from 'Refraction of Light 'and 'The Human Eye and the Wonderful World', using the Semi-structured Interview Guide.

Methodology

The investigators selected the topics 'Refraction of Light 'and 'The Human Eye and the Wonderful World' to prepare Semistructured Interview Guide for identifying Misconceptions exist among students of Standard ten. The required data which served as the basis for the preparation of Semistructured Interview Guide were collected using the technique Content Analysis. The investigators analysed the content and listed the Anticipated Misconceptions.

The investigators prepared the Semistructured Interview Guide on the basis of Anticipated Misconceptions, in order to identify the Misconception in the selected areas. In a Semi-structured Interview, the interviewer and respondents engage in a formal interview, where the interviewer uses a formal 'Interview Guide' which contains the list of questions or topics in a particular order, that should be covered during Interview. The investigator prepared Semi-structured Interview Guide on the basis of the anticipated Misconceptions identified through (i) Content Analysis, (ii) discussion with secondary school Physics teachers and (iii) personal experience. Semi-structured Interview Guide included introduction of the interviewer, preliminary details of the interviewee and questions to be asked to the interviewee during Interview.

The investigators conducted the Semistructured Interview with 12 students comprising of five boys and seven girls of Standard ten, using the Semi-structured Interview Guide. The duration of interview with each student was 45 minutes. On interviewing the students, the nature of Misconceptions possessed by them were made clear.

Tools and Techniques used in the Study

- i) Content Analysis
- ii) Semi-structured Interview Guide

i) Content Analysis

Content Analysis is the life blood of instructional planning. The purpose of

Content Analysis in the present study is to identify the concepts included in the content area and to spot the concepts which may cause potential Misconceptions. It is achieved by breaking the content into its constituent parts and arranging them in sequence. The investigator analysed content qualitatively in order to identify the terms, facts, concepts and formula included in the selected topics, 'Refraction of Light' and 'The Human Eye and the Wonderful World', in the Physics text book of Standard ten, prepared by NCERT, which cause potential Misconceptions and to list out the possible Misconceptions. To prepare the coding categories, the investigator classified the entire content as terms, facts, concepts and formula.

ii) Semi-structured Interview Guide

The Semi-structured Interview Guide was prepared using the Anticipated Misconceptions listed through Content Analysis. The investigators listed the Anticipated Misconceptions analysed those one by one. The need of inclusion of each statement in the Semi-structured Interview Guide was made clear by discussing the matter with secondary school teachers. After this, the investigators prepared the questions which reveal the extent of Misconceptions and correct conceptions. The questions thus prepared were again discussed with three secondary school Physics teachers in order to determine whether the particular question is to be included or not. Thus the pattern of each item comprised of three sets of questions -(i) main question which is to be asked to all the interviewees (ii) depending on the answer given, the interviewer can ask prompting questions, to reveal the concepts

or Misconceptions the interviewee holds, and (iii) probing questions which enables the interviewer to understand the depth of conceptions or Misconception held by the interviewee.

Analysis and Interpretation of the Data

i) The probable Misconceptions identified through Content Analysis

The investigator categorized the data collected through qualitative Content Analysis into terms, concepts, generalizations and process, illustrations and examples, and anticipated the Misconceptions in Physics related to the selected content. The category wise list of content and anticipated Misconception in Physics obtained through the Content Analysis were used in the preparation of Semi-structured Interview Guide.

ii) Preparation of Semi-structured Interview Guide

The Semi-structured Interview Guide was prepared using the Anticipated Misconceptions listed through Content Analysis. The Anticipated Misconceptions listed were analysed one by one and the questions to reveal the extent of Misconceptions and concepts were prepared. Thus the pattern comprised of three sets of questions – one main question which is to be asked to all the interviewees, and depending on the answer given, the interviewer can ask prompting questions, to reveal the concepts or Misconceptions the interviewee holds, and probing questions which enables the interviewer to understand the depth of conceptions or Misconception held by the interviewee.

SEMI STRUCTURED INTERVIEW GUIDE

Reshmi. K.S & Dr:(Sr.) Celene Joseph

Introduction of the interviewer	
Name and Address	:
Designation	:
Years of experience	:
Goal of interview	:
Duration	:
Details of the interviewee	
Name and Address	:
Name of school	:
Standard	:
Gender	:
Academic performance in science	:
Hobby	:
Parents' occupation	:

	Main Questions	Prompting	Probing
1	What do you mean by light?	What makes things visible? What is the speed of light?	How can we see things with the help of light? Does light travel with same speed everywhere?
		What is meant by path of light?	Name some of the properties of light. What happens when light travels through a prism and glass slab?
2	How will you explain a lens?	Why do palmisters use lens? What are the uses of	Which type of lens is used in palmistry? How will you identify concave lens?
		lens?	What is optic centre?
		Name the various types of lens? What does thickness	How does lens form image of objects?
3	Can you represent a ray of light travelling from a source to an object? If so, explain how.	You are provided with a lighted candle and a book. Draw the path of light that enables the vision of book with the help of candle light.	What does the arrow mark in a ray of light represent? Does light ray bend? What happens to the size of an object immersed in water? Standing on the side, the pond seems to be shallow. Why?
4	How is density different from optical density?	How will you find the density of an object ? Name the media through which light travels when one view a fish in a pond?	a)What do you mean by optically denser medium? Which is the denser medium, air or glass? Does light have same velocity in air and glass? Why?
5	Does the speed of light varies when it travels from one medium to another? What is a prism?	What is a prism? Light falls on the prism and come out of it. Name the media involved for the travel of light.	What happens when light passes through prism and glass slab?

C. Questions to backing interview

6	What is the difference between real image and virtual image?	Where do you see image?	What is image?
7	What is the reason for total internal reflection?	Give an example for total internal reflection. How can we make use of opticalfibres to study internal organs ?	When does total internal reflection occur? What is critical angle? What is mirage?

iii) Students' Misconceptions revealed through Semi-structured Interview

The table 1.0 presents the topic wise findings obtained from the Semi-structured Interview.

Table 1.0

The Response	obtained	through	Semi-struct	ured .	Interviev	N
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Sl.No	Question	Answers	Frequency
1	What do you mean by	We can see objects due to the presence of	1
	light?	light.	9
		Light is energy.	2
		Same as brightness.	
2	What makes things	Sunlight	1
	visible?	Light	9
		Eye	1
		Light and eyes.	1
3	What is the velocity of	3x10 ⁸ m/sec	8
	light?	Constant.	2
		Same everywhere.	2
4	What is meant by path	Path along which light travels.	8
of light?	of light?	It is a straight line.	2
		It is a line showing the path through which light travels.	1
		The higher the energy of the source, the longer is the distance or path travelled by light, as in the case of sun and electric bulb as source.	1
5	How can we see things	Light illuminates the things.	2
	with the help of light?	Using our eyes.	
		- •	10

6	Does light travel	No.	4
	with same speed	Yes.	6
	everywhere?	Yes, because velocity of light is a	2
		constant, always.	
7	Name some of the	Reflection, scattering.	3
	properties of light.	Light energy can be converted to other	6
		forms of energy.	
		Penetration.	1
		Velocity of light is very high.	2
8	What happens when	Colours can be seen.	3
	light travels through	Light expands.	4
	prism and glass slab?	We can see colours as in a rainbow.	2
		Light enters and makes inner parts visible.	3
9	How will you explain	Lens is used to see objects clearly.	4
	'lens'?	Lens is used in microscope, telescope and	1
		spectacles.	1
		Lens enlarges the size of objects.	1
		It allows light to pass through it.	1
		Eye has lens.	1
		Lens help to see distant objects clearly.	1
		It is used in palmistry and microscope.	2
		By moving the lens, the image becomes larger or smaller.	
10	Why do palmisters use	Lens enlarges the lines in the hand.	8
	lens?	Lens makes the vision of lines in the hand clear.	4
11	What are the uses of	Lens is used to see objects clearly.	3
	lens?	Lens is used to enlarge the size of objects to the extend we need, as in microscope.	2
		Lens is used in telescope to see distant	3
		objects.	3
		Lens gives clear vision, and hence it is used in spectacles.	1
		Lens enlarges the size of objects	
12	Name the various	Lens used in microscopes.	3
	types of lens	Lens used in spectacles.	4
		Lens used in telescopes.	4
		Lens used in palmistry.	1

13	What does thickness of	The thicker the lens, more its power.	7
	a lens indicate?	Power depends on thickness.	3
		Serious eye defects are cleared using	2
		thick lens.	
14	Which type of lens is	Enlarging lens.	11
	used in palmistry?	Common lens.	1
15	How will you identify	It is used in instruments.	2
	concave lens?	It enlarges the size of objects.	3
		No response.	7
16	What is 'optic centre'?	Centre of light ray.	2
		Centre of light source.	1
		Midpoint of light ray drawn.	9
17	How does lens form	Image is formed by clicking in camera.	10
	image of objects?	By reflection from lens.	2
18	Can you represent a	Yes. Draw a straight line between source	10
	ray of light travelling	and object. This line represents travelling	
	from a source to an	light.	
	how	ino response	2
10	Imagina you ara	Light illuminates the book	1
19	provided with a lighted	Light falls on book and illuminates it	1
	candle and a book.	Light from the candle falls on book. With	3 1
	How will light travel	the help of eves we can see	7
	to enable the vision of	Light from the candle falls on the book	1
	book?	and from there, it reaches our eyes.	1
20	What does the arrow	Direction of light	11
20	mark in a ray of light	Rav	1
	represent?		-
21	Does light ray bend?	Yes.	4
	0 1	No.	7
		When light ray hits an obstacle, it bends	1
		or reflects.	
22	What happens to	Same size.	3
	the size of an object	Size becomes larger.	2
	immersed in water?	Size becomes smaller.	4
		Object becomes flatter and changes its	3
		size.	
23	Standing on the side,	Due to lack of water.	1
	the pond seems to be	Due to property of eye.	4
	snallow. why?	Not seen like that.	1
		No response.	6

24	How is density	Density is mass per unit volume.	11
	different from optical	Optical density is mass per unit volume	1
	density?	of opticals.	
25	How will you find the	Density is the mass per unit volume.	11
	density of an object?	By knowing mass and volume.	1
26	Name the media	Atmosphere	3
	through which light	Water	8
	travels, when one view a fish in a pond.	Water and air.	1
27	What do you mean	The density of light is more in that	6
	by optically denser	medium.	
	medium?	No response.	6
28	Which is the denser medium, air or glass?	Glass	12
29	Does light have the	No, because air is lighter than glass.	6
	same velocity in air and glass? Why?	Yes. Velocity of light is a constant.	6
30	Does the speed of light	Yes	6
	varies when it travels	No	6
	from one medium to another?		
31	What is a prism?	It is like a triangle and shine like a	9
	-	diamond.	3
		It is a glass object.	
32	What happens when	Glass and air.	6
	light falls on the prism or glass slab and	Light enters the prism or glass slab and expands. Media involved is Atmosphere.	2
	comes out of it? Name	Light reaches everywhere inside the	2
	the media involved for the travel of light.	prism and glass slab. Media involved is prism or glass slab.	2
		Prism or glass slab and air.	
33	What is the difference	Real image gives actual image of an	4
	between real image	object.	1
	and virtual image?	The size and shape are same as that of	2
		object.	3
		Virtual image is seen in a virtual	1
		laboratory.	1
		Virtual image is created with the help of	
		computer.	
		Virtual image is not real.	
		Virtual image is only an illusion, not real.	

34	Where do you see	We see image on a flat surface.	6
	image?	We see image on mirrors.	4
		We see image in gallery.	1
		We see image in television.	1
35	What is image?	Image is the reflection of object on	4
	-	mirrors.	8
		Image is a picture.	
36	What is the reason	Light completely reflects to inside.	7
	for total internal	It is a property of light.	3
	reflection?	When the surface is polished, total	2
		internal reflection occur.	
37	Give an example for	Kaleidoscope	1
	total internal reflection.	Sun	3
		Mirror	2
		No response.	6
38	How can we make	Optical fibres are fine glass tubes.	7
	use of optical fibers to	Optical fibre is made from different types	1
	study internal organs?	of sheep's wool.	
		No response.	4
39	When does total	When light completely reflects inside.	3
	internal reflection	Total internal reflection is a property of	2
	occur?	light. Hence it occurs in the presence of	
		light.	3
		When the surface is polished, total	
		internal reflection occurs.	4
		In mirrors, total internal reflection occurs.	
40	What is critical angle?	It is an important angle.	2
		Beyond that angle, we cannot see.	9
		It is an angle at infinity.	1
41	What is mirage?	It is a feeling of the presence of	
		something which is not actually present.	1
		It is an optical illusion.	2
		It is a property of eye.	2
		It is a property of light.	3
		No response.	3
		It is due to persistence of vision.	1

From the responses given by the students in the Semi-Structured Interview, the investigators identified the following Misconceptions.

- 1. Light is the same as brightness.
- 2. Misconceptions about the path of light as it are a straight line.
- 3. When light travels through prism and glass slab, it expands and reaches everywhere inside and illuminates prism and glass slab.
- 4. Bending of light (refraction) occurs when light rays hit on obstacle.
- 5. When light hits on a polished surface, total internal reflection occurs.
- 6. Mirage is a property of the eye.
- 7. The higher the energy of the source, the longer the light wave travels as in the case of sun and electric bulb.
- 8. While moving the lens, the image becomes larger or smaller.
- 9. Real image is the actual image of an object.
- 10. Virtual image is seen in a virtual laboratory.
- 11. In an optically denser medium, the density of light is more.
- 12. Thickness of a lens determines the power of a lens.
- 13. Optic centre is the centre of a light ray.

Findings and Conclusions of the Study

A Semi-structured Interview Guide, were constructed based on the Anticipated Misconceptions identified through Content Analysis. On administering the Semistructured Interview, using Semi-structured Interview Guide, the Misconceptions among students of Standard ten regarding the selected areas of the content 'Refraction of Light' and 'The Human Eye and the Wonderful World' were identified. The study revealed that there exist Misconceptions among the students of Standard ten regarding the selected areas of the content 'Refraction of Light' and 'The Human Eye and the Wonderful World'.

Conclusion

The acquisition of the basic concepts in all subjects takes place at the secondary level. But the Physics concepts possessed by secondary level students are vague, leading to erroneous knowledge and Misconception formation. This can be rectified by assessing the Misconception possessed by students and addressing them in the classroom itself. The investigators examined the Semi-structured Interview Guide developed by them and found that it enabled them to reveal the Misconception in its extend so that the Misconceptions could be rectified at the beginning stage of the study of the important and promising branch of Physics.

References

- Alwan, A. (2011). Misconception of heat and temperature among physics students.*Procedia* - *Social and Behavioral Sciences*, *12*(1), 600-614. DOI: 10.1016/j.sbspro.2011.02.074.
- Burgoon, J. N., Heddle, M.L., & Duran, E. (2010).Re-examining the similarities between teacher and student conceptions about Physical Science.*Journal of Science Teacher Education*, 21(7), 859-872. Retrieved from ERIC database (EJ 901910).
- Çalık , M., &Ayas, A. (2005). 30 A cross-age study on the understanding of chemical solutions and their components. *International Education Journal*, 6(1), 30-41.
- Djanette, B., &Fouad, C. (2014).Determination of university students' misconceptions about light using concept maps. Science Direct .*Procedia - Social and Behavioral Sciences*, 152, 582–58.Retrieved from www. sciencedirect.com.

- Fisher, K.M. (1985). A misconception in biology: Amino acids and translation. *Journal of Research in Science Teaching*, 22(1), 63-72.
- Gilbert, J.K., & Watts, D.M. (1983). Concepts, misconceptions, and alternative conceptions: changing perspectives in science education. *Studies in Science Education*, 10,61–98.
- Haslam, R., &Treagust, D.F. (1987).Diagnosing secondary students' misconceptions of photosynthesis and respiration in plants using a two-tier multiple choice instrument.*Journal* of Biological Education, 21(3), 203-211.
- Hurlock, E.B. (2008). *Child Development*.New Delhi: McGraw-Hill.
- Hurlock, E.B. (2001). Developmental Psychology. New Delhi: McGraw-Hill.
- Kaewkhong, K., Mazzolini, A., Emarat, N., & Arayathanitkul, K. (2009). Thai high-school students' misconceptions about and models of light refraction through a planar surface. *Physics Education*, 45(1).
- Liu, T., Lin, Y., & Tsai, C. (2009). Identifying senior high school students' misconceptions about statistical correlation, and their possible causes: An exploratory study using concept mapping with interviews.*International Journal of Science and Mathematics Education*, 7(4), 791-820. (EJ853440).

- Lucariello, J., &Naff, D. (1997). How do I get my students over their alternative conceptions (misconceptions) for learning?: Removing barriers to aid in the development of the student. *American Psychological Association*. Retrieved from http://www.apa. org/education/k12/misconceptions.aspx
- Odom, A.L., & Barrow, L.H. (1995). Development and application of a two-tier diagnostic test measuring college biology students' understanding of diffusion and osmosis after a course of instruction. Journal of Research in Science Teaching, 32(1), 45-61.
- Rahman, N.A.(2004).*Physics teachers strategies* and reflective ability for addressing pupils misconceptions in the classroom. Paper presented at the British Educational Research Association Annual Conference, University of Manchester.
- Sahin, C., Ipek, H., &Ayas, A. (2008). Students' understanding of light concepts primary school: a cross-age study. Asia-Pacific Forum on Science Learning and Teaching, 9(1).
- Stein, M., Larrabee, T.G., & Barman, C.R. (2008). A study of common beliefs and
- misconceptions in physical science. Journal of Elementary Science Education, 20(2), 1-11.
- Uzun, S., Alev,N., Karal., &Işık, S.(2013). A cross-age study of an understanding of light and sight concepts in physics.*Science Education International*, 24(2), 129-149.

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OPEN SOURCE AND ACADEMIC PUBLISHING

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ABSTRACT

Open access, which is free and unrestricted world-wide electronic distribution and availability of academic resources, is a relatively new concept in publishing. The purpose, for it is to remove all barriers such as copyright, licensing, price and permission barriers that block access and limit usage of educational resources. The justification for the removal of these barriers is the increasing prices of educational resources in the face of economic recession. Also, there is a need to close up the existing information and innovation divide between the developed and developing countries. In this paper, open access and academic Publishing will be discussed in the light of the advent of technology. The argument for open access to educational resources was traced from the history of the Ancient Greece when knowledge and information was not regarded as a commodity that can be owned by anybody or by an organization to the beginning of the nineteenth century when law and economics scholars launched a crusade to expose the evil of authors not claiming ownership of their work. The paper systematically presented arguments for open access publishing in order to sensitize the populace of the need to encourage and embrace this concept and remove all bottlenecks to knowledge and innovation. Finally, as part of the recommendations, Research Institution, Universities, the Federal Government should fund Open Access Resources. It should not be a burden to the researcher neither should publishers be permitted to charge exorbitantly for access to resources.

Keywords: Open Access Publishing (OAP); Copyright law; Open Educational Resources; Open Source Publishing

Definition Of Open Educational Resources (OER)

Open Educational Resources (OER) can be defined as 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 (Johnstone, 2005). According to Suber (2013) open educational resources is commonly referred to as digitized materials offered freely and openly for educators,

* (Deputy University Librarian) National Open University of Nigeria (NOUN) E-mail: angelaebele2007@yahoo.com students and self-learners to use and reuse for teaching, learning and research. In other words, open access or open source refers to free and unrestricted world-wide electronic distribution and availability of academic resources. Open access resources are not just free of charge to everyone with an internet connection but free of most copyright and licensing restrictions (Suber, 2012; Poydner, 2011). Price barriers and permission barriers that block access and limit usage of most resources are removed. OER include:

- 1) **Learning Content** Such as full courses, courseware, content modules, learning objects, collections and Journals.
- 2) **Tools** Software that supports the development, use, reuse and delivery of learning content, including searching and organization of content, content and learning management systems, content development tools, and online learning communities.
- 3) **Implementation** resources which are intellectual property licences that promote open publishing of materials, design principles of best practice and localized content.

History and Theory of Open Access

In the ancient Greece, and most pre-modern civilizations, knowledge and information was not regarded as a commodity that can be owned (May and Sell, 2006). At this time, the public frowned at the idea of teachers collecting fees or reward for teaching. In fact lecture materials were free. It was not a surprise that one of Plato's student, Hermodoros of Syracuse was seriously criticized for making a sale of Plato's lectures which was meant to be a gift. In fact, the attempt to protect open access to knowledge led to a civil war (Frosio, 2014). This happened when the Irish Saint Columba made a copy of the Abbot's Psalter when he visited Albot Finnian. Finnian demanded its return but Saint Columba refused. The matter was referred to king of Tara who ruled in Finnian's favour. Angered by the decision, Columba started a protest that led to the defeat of the king.

Saint Columba did not relent in his fight for Open access to knowledge. Even after universities took over the role of the monasteries in the twelfth century, open access was still strictly maintained. The idea that culture, knowledge and creativity are gifts that cannot be sold on the open market has strong roots in ancient and medieval times. Eventually, this concept gave way in the nineteenth century and the market took over almost entirely. In the 1960's, law and economics scholars launched a crusade to expose the evil of the commons, that is, the evil of authors not claiming ownership (Salzberger, 2006). In recent years, a revisionist movement has also started to ponder whether copyright policies struck the right balance between protection, incentive or creation, access to knowledge, circulation and cumulative production of knowledge.

The Case for Open Access Publishing

So much money is invested worldwide in research and development in order to solve scientific, technological and social problems. Most of these research findings are communicated in scholarly journals that are disseminated on the basis of subscriptions or licences. In the US alone, the scientific, technical and medical publishing market is estimated at between \$7-11 billion (OECD, 2004).

Publicly-funded researchers do not expect to receive royalties or other financial payment for communicating their findings via research articles. The question therefore is, why shouldn't these publicly-funded articles be freely available from the Internet? The free availability of published research offers greater opportunities for its discovery and subsequent application in contexts that may advance knowledge, facilitate problem solving and enhance technology transfer, which represent the purpose of scholarly endeavour.

Open access publishing is an initiative that aims to provide universal, unrestricted free access to full-text scholarly materials via the Internet. This presents a radically different approach to the dissemination of research articles that has traditionally been controlled by the publishing enterprise that regulates access by means of subscriptions and licences fees levied on users, predominantly academic libraries.

The existing fee based scholarly journal publication has been criticised. It has made the dissemination of research findings to be limited only to individuals or institutions that can afford subscription fees which is inimical to the ethos of open scientific inquiry. Also, it delays publication of research findings as publishers have to wait until they have sufficient researchers who can afford to publish with them. Therefore, formal publication of research findings can take from 6 to 18 months after submission. Again, the copyright of the author is signed over to the publisher, limiting the author's right to use, copy and share the text. Moreover, librarians are critical of the terms of commercial publishers' licencing contracts for e-journals which encroach upon fair practice that is a legal limitation on copyright laws.

In addition, the imperative for academics to publish in order to achieve recognition and advancement has resulted in an upsurge in the number of journal titles to accommodate the outpouring of articles. From the academic library's perspective, it is no longer possible or affordable to provide all researchers with all of the material that they require.

Open access publishing endorses the goal of allowing information to flow more freely among researchers and the public at large as a reaction to perceived pitfalls in the present system of circulation of academic knowledge and the dematerialization of scholarly publishing after the advent of electronic publishing and the internet distribution. As a general rule, Open access refers to a publishing model where the research institution or the party financing the research pays for publication and the article is then freely accessible (Poydner,2011). The open access movement in scholarly publishing was inspired by the dramatic increase in prices for Journals and publisher restrictions on the reuse of information

Free access to publicly funded scientific research is more democratic and is necessary for knowledge dissemination and production in a knowledge economy, particularly for developing countries such as Nigeria. The academics reaction against the 'cost of knowledge' known as the 'Serial Crises' is on rise, especially against the practice of

charging exorbitant high prices for journals and of selling Journals in very large bundles. Subscription based system severely restricts access to leading edge research considering the fact that most research are publicly funded (through research grants; academics incomes). The commercial publishers through copyrights/licensing monopolize public resources and charge exorbitant fees for their use. The researchers, willing to publish with reputable Journals, surrender their copyright for a fee (commission). However, with open access publishing, most journals and repositories do not impose access costs on their readers. Thus price barriers are substantially lowered or removed entirely. Authors are thus granted the ability to address a wider audience without the corresponding expenditure. The reach of the articles or materials increases tremendously since readers can retrieve it regardless of their economic status or geographical location

Also, with open access publishing, research results can be made immediately available to not just others within that community but also those beyond, including other scientists and laypeople. Easy access to research results and materials from all fields spurs interdisciplinary and multidisciplinary research endeavours.

Open Access Publishing Movement Initiative and Declaration

The Three Bs: Budapest, Berlin and Bethesda

A major theoretical boost to OAP movement was from 2001 to 2003 by three initiatives and their related declarations. (IFLA 2013; Yiotis, 2005)

Budapest Open Access Initiatives (BOAI): This was as a result of a conference organized in Budapest by the Open Society Institute in 2011. From this initiative, open access was seen as free availability on the public internet, permitting any user to read, download, copy, distribute, print, search, or link the full text of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

Bethesda Initiative and declaration

This initiative was as a result of a meeting of interested parties such as funding agencies, scientific societies, publishers, Librarians, research institutions and individual scientists at Maryland in 2003. The Bethesda statement identified an open access publication as one that meets two conditions:

- the author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution to authorship, as well as the right to make small numbers of printed copies for their personal use.
- A complete version of the work and all supplemental materials, including a copy of permission as stated above, in a suitable

standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and longterm archiving.

Berlin Initiative & Declarations

At the Berlin Conference in 2003, the scientific requirements that materials for open access should meet were declared. Berlin Defined Open Access as a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community. This declaration has been signed by hundreds of Europeans and international institutions.

The three initiatives discussed have uniformity in the core concept of removing price and permission barriers. They also agreed on the authors consent as the basis for open access.

Other Initiatives that Boosted Open Access Movement

SPARC and Civil Society: The open access movement was boosted by countless initiatives of which the Scholarly Publications Access Resource Coalition (SPARC) is one of the most prominent. SPARC is an international alliance of academic and research libraries which promotes open access to scholarship with currently over 800 institutions in Australia, China, Europe, Japan and North America. SPARC was developed by the Association of Research Libraries to address the problem of imbalance in the scholarly publishing system.

OASPA: The Open Access Scholarly Publishers Association (OASPA) was launched in 2008 to support and represent the interests of open access journals and book publishers globally in all scientific, technical, and scholarly disciplines.

Open Access Publication Models

The open access models mainly depend on the delivery mechanism of the articles and status of the traditional barriers to access. Below are some categories of OAP:

GOLD: In the gold open access model, an author contracts with an open access publisher, who in turn ensures that the manuscript is subjected to peer review and editing before the work is made openly accessible. This model provides immediate public access to all contents of the articles through a journal with no charge to all readers. Different funding strategies for funding open access journals are:

- Advertising
- Membership fees
- Author fees (money may come from the author or more likely the author's research grant)
- Can be waived in cases of financial hardship
- Subsidies from institutions such as universities, laboratories, research centers, libraries, foundations, museums or government agencies

Green Open Access: green open access is where an author publishes their article in any journal and then self-archives a copy in a freely accessible institutional or specialist online archive known as a repository, or on a website. Green open access does not offer the same legal framework for content licensing. As a result, (scientific) exploitation is only permitted within the confines of the legal restrictions of copyright law. That means that the author's contract has to be carefully reviewed to enable an article to be re-used in a way that fulfils all the legal stipulations. There is no uniform rule governing the open accessibility of publications because different publishing houses impose different embargo periods before making the articles freely available.

Delayed Open Access: In the delayed open access, readers have open access after an embargo period of 6-12 months or more.

Hybrid Open Access: For the hybrid open access journals, open access is article based. Open access is provided for individual articles for which the authors (research sponsors) pay a publication fee. Hybrid open access is partially funded by subscription.

Libre Open Access: This refers to online open access free of charge plus some additional re-use rights. The re-use rights of libre open access are often specifically by various specific Creative Commons (CC) licenses. In all, attribution of authorship is to the original author. A creative common license is one of several public copyright licenses that enable the free distribution of an otherwise copyrighted work. A creative common license is used when an author wants to give other people the right to share, use, and build upon a work that he or she (that author) has created. CC provides an author flexibility (for example, he or she might choose to allow only non-commercial uses of a given work) and protects the people who use or redistribute an author's work from concerns of copyright infringement as long as they abide by the conditions that are specified in the license by which the author distributes the work.

Gratis Open Access: This refers to online access to readers free of all charges. A gratis OA publication is free of price barriers as the publication is openly available, free of charge

Open Access Channels

There are some open access channels such as the electronic repositories that give authors the opportunity to archive digital 'e-prints'

a) Subject-specific Repositories:

Subject-specific or subject-based repositories bundle together research outputs of specific scientific disciplines regardless of the institutional affiliation of the researchers. Armbruster and Romary (2010) indicated that spontaneous selfarchiving is prevalent as the repository is of intrinsic value to scholars. Much of the intrinsic value for authors comes from the opportunity to communicate ideas and results early in the form of working papers and preprints, from which a variety of benefits may result, such as being able to claim priority, testing the value of an idea or result, improving a publication prior to submission, gaining recognition, achieving international attention and so on. As such, subject-based

repositories are thematically well defined and alert services and usage statistics are meaningful for community users.

b) Institutional Repository (IR):

IRs bundle together the research output of an institution, such as a university or research centre, in order to make it available to the public. Institutional repositories contain the various outputs of the institution. While research results are important among these outputs, so are works of qualification, and teaching and learning materials. If the repository captures the whole output, it is both a library and a showcase. It is a library holding an institutional collection, and it is a showcase because the online open access display and availability of the collection may serve to impress and connect, for example, with alumni of the institution or the colleagues of researchers. A repository may also be an instrument of the institution by supporting, for example, internal and external assessment as well as strategic planning. Moreover, an institutional repository could have an important function in regional development. It allows firms, public bodies and civil society organisations to understand immediately what kind of expertise is available locally.

Open Access Publishing and Copyright

Copyright plays a vital role in scientific publishing. Copyright can act in two ways in protecting a scientific work. Copyright can provide protection either through the author or through the publisher. In the first instance, copyright provides authors with a set of rights to enable them utilize their work and be recognised as the creator of the work. On the other hand copyright can

be transferred to publishers in which case, the publishers are empowered to act on behalf of the authors. In practice, authors as copyright holders, must give consent before their articles can be published with open access and made universally and freely available. The legal code for such agreement is created by creative commons and in particular, their attribution license is written specifically for this purpose. Authors are generally not happy to transfer their copyright to publishers, however some publishers insist (Horn & Van Der Graff, 2006). Moral rights which are embedded in copyrights are well acknowledged in the scholarly communication system and are upheld even when the copyright is transferred from an author to a publisher. Therefore, moral rights are not at stake in the copyright debate; rather, the debate centres on exploitation rights. The right to reuse is the key to the definition of Open Access: effectively, Open Access means free online access and permission to use the information for any responsible purpose.

Choices with Regard to Copyright

There are basically three choices with regard to copyright. These are:

- To retain
- To share
- To transfer

Retain

This model allows authors to retain their copyright and restricts reuse to educational purposes. This was an early type of open access copyright model. The policy of this model is spelt out as follows:

The author keeps the copyright.

- The copyright notice mentions that classroom use is free, but other uses depend on the permission of the authors themselves.
- The journal asks only for a licence to publish the article as the first publisher.

Share

In this model "all rights are not reserved by the author". Some rights are shared through various types of licences that can encourage certain defined user while the creators can still protect their works. This can be achieved through the creative commons which was inspired by the open source software movement in 2001.However, the authors moral rights are still reserved. In other words, the author has the right to be cited through a proper citation. The public can use and reuse the article, including for commercial purposes. This type of licence maximises the impact of the research article for the author.

Transfer

The British Medical Journal (BMJ) and Nucleic Acid Review are two prestigious journals that recently switched from the traditional model of publishing to an Open Access model. They use licences that keep the copyright with the author, but the author transfers all commercial exploitation rights to the publisher. What does this policy mean? The BMJ, for example, leaves the copyright with the author, only requiring an exclusive licence to publish the article first and claiming all commercial exploitation rights. The author retains all other rights to his or her BMJ article. In addition, the BMJ publishing group gives the author a percentage of the royalties if they enter into

a commercial republishing or redistribution deal on the basis of the author's article.

The advantage for authors is that they can do whatever they want with their own article without asking the BMJ publishing group's permission as long as commercial rights are not involved. The other advantage, of course, is that the model provides for potential revenue for the authors from royalties: so far, this seems a unique approach in the world of academic publishing.

The tension between access to information and copyright system is unavoidable and originates from the dual functionality of knowledge as a commodity and as a driving social force. Article 27 of the Universal Declaration of Human Rights stated in paragraph one that:

• 'Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.' The second paragraph spells out the protection of the second term of the intellectual property paradox: 'everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author'

Conclusion

Open Access Publishing should be encouraged by all stakeholders. It holds manifold advantages ranging from democratization of innovation to putting an end to the serial crisis in libraries. There is a need to bridge the educational divide between the developed and developing Countries. This cannot be achieved without first granting free access to knowledge and information considering the economic status of developing countries. It is therefore recommended that the Federal Government and Institutions should fund open access resources and put an end to the commercialization of information by Publishers.

References

- http://www.opensocietyfoundations.org/ openaccess.
- http://www.earlham.edu/~peters/fos/bethesda. htm
- Frosio, G. (2014). Open access publishing: A literature review. CREATE Working Papers 2014/1 http://www.create.ac.uk/ publications/000011
- Harnad, S. (2004). The access/impact problem and the green and gold roads Open access. Serial Review 30, 310
- International Federation of Library Associations (IFLA) (2018). IFLA statement On open access to scholarly literature and research documentation, http.//www.ifla. org/publications/ifla-statement-on-openaccess-to-scholarly-literature-and-researchdocumentation. Accessed 7th August 2018
- Johnstone, S. (2005). Open educational resources and open content, background Note. International Institute for Educational Planning, Internet Discussion Forum on Open Educational Resources, Open Content for Higher Education http://www.oecd.org/ education/ceri/38654317.pdf
- Laakso, M. (2011). The development of open access journal publishing from 1993-2009.
 PLoS ONE, 6(6) http://journals.sfu.ca/src/ index.php/src/article/view/24/41 accessed 7th August 2018

- Laakso, M. & Bjork, B. (2012). Anatomy of open access publishing: A study of longitudinal development and internal structure .BMC Med,10(1) 124
- May, C. & Sell, S.K. (2006). Intellectual property rights: A critical history. Lynne Rienners Publishers
- Poydner, R. (2011). Leader of a leaderless revolution. Information Today, July/August. http://www.infotoday.com/it/jul11/Suber-Leader-of-a-leaderless-Revolution.shtml accessed 7th August 2018
- Salzberger, E.M. (2006). Economic analysis of the public domain. In Lucie Guibault and Bernt Hugenholtz(eds), The Future of the Public Domain : Identifying the Commons in Information Law. Kluwer Law International
- Suber, P. (2012). Open Access. MIT Press
- Suber, P. (2013). Timeline of the open access movement http://legacy.earlham.edu/~peters/ fos/timeline.htm accessed 7th august 2018
- Yiotis, K. (2005). The open access initiative: A new paradigm for scholarly Communications. Information Technology and Libraries, 24(4), 157-162
- Tempest, David (2012). The importance of protecting content https://www.elsevier.com/ editors-update/story/access/copyright-in-anopen-access-world#maincontent
- Horn, E. & Van der Graf, M.(2006). Copyright issues in open access research journals.D-Lib Magazine, 12(2) http://www.dlib.org/dlib/ february06/vandergraaf/02vandergraaf.html

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RE-FOCUSING TERTIARY EDUCATION CURRICULUM FOR SUSTAINABLE DEVELOPMENT

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Abstract

A key ingredient for sustainable development is education and the best starting point is through responsive curriculum. Education is meant for developing human capability. It is a means through which every nation empowers her youth with relevant skills and knowledge for the future. Education requires constant reflection and re-strategizing to meet societal needs. The changing economic, social and political realities spur the need for restructuring the educational sector. The validity of any educational system is measured by the relevance of her curriculum. Curriculum is a structured plan of action that guides the process of education. Hence, any attempt at re-engineering the educational system should focus on structure and context of school curriculum, especially at the tertiary level where talents and high level man power are developed. In line with this thought, the paper explored ways of promoting sustainable development through a well articulated and planned curriculum at the tertiary levels.

Introduction

Education plays a key role in empowering people to work for a sustainable future. The degree and extent of socio-economic and political improvement is influenced by level of education. It is the most promising path for individuals, societies and nations to realize better and to live more productive lives. Tertiary education refers to academic pursuit undertaken after high school. It could be seen as a post secondary education which provides a range of broader, measurable benefit to graduates. Tertiary education form professional in key areas and it is meant to advance economic growth and global competitiveness through provision of accessible, relevant and high quality education. The criterion for achievement of high quality education is through effective implementation of relevant curriculum.

Curriculum is the totality of learning encounter that students are exposed to in the course of their learning. It is the content of what is taught along with an overall

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process of how that content is to be taught. In other words, it is a planned sequence of learning experiences. Dada, Kolawole and Arikpo (2003: p42) define curriculum as the "totality of what and how of any educational enterprise". Curriculum is also seen as all of the experiences that learners have under the auspices of the school (Nakpodia, 2010). It is an organized instruction which spells out goals and objectives to be achieved. Curriculum is the heart and soul of Education (Huebner, 1966). Curriculum reflects the need and problems of the society among other things. The fact that societal needs are varied and changes with time, coupled with the fact that curriculum is dynamic which also demands changes in the light of the changing societal needs makes innovation an inevitable factor to keep it functional. Igwe (2003) viewed that relevance implies functionality, fitness and appropriateness to the needs of daily life, the hope and expectations for tomorrow and preparations for the uncertainties and challenges of the unknown future. Udofot (2005: 19) viewed that 'there is still a frustrating gap between the curriculum and the realities of the societies.

Talking of societies, current issues and trend in the Nigerian society should necessitate the adjustment of certain areas of the curriculum for higher productivity as it concerns student's performance and preparation for workplace. It then became obvious that any fundamental change in the intellectual and social outlook of any society has to be proceeded by an educational revolution. Higher education is fundamental to the construction of knowledge economy in all nations. This

nation depends on the knowledge generated by tertiary institutions to propel them to desired social, economic and technological development. Development is essential to the sustenance and growth of any nation. Sustainable development is a pattern of resource use that aims to meet human needs while pressuring the environment so that these needs can be met not only in the present but also for generations to come (Wikipedia, 2011). In other words, updating tertiary education according to today's knowledge with responsive curriculum is the main step to achieve sustainable development hence the need for refocusing tertiary education curriculum for sustainable development.

Need for Re-Focusing Tertiary Education Curriculum for Sustainable Development

Tertiary Education prepares most of the professionals who develop, lead, manage, teach, work in, and influence society's institutions (Cortese, 2003). They prepare graduates for multi-disciplinary approach to problem solving. Tertiary institutions are meant to respond to evolving educational needs. They have a critical role in supporting knowledge-driven economic growth strategies and the construction of democratic, socially cohesive societies. Tertiary institutions are charged with the responsibility of developing human capital for the overall development of the nation. The critical role that higher education institutions should play in the development of Nigeria is succinctly summarized in section 5(81) of the National Policy on Education (FRN, 2014) shall be to:

a. Contribute to national development through high level manpower training;

b.

- Provide assessable and affordable su quality learning opportunities in formal and informal education in response to the needs and interest of all Nigerians; co
- c. Provide high quality career counseling and lifelong learning programmes that prepare students with the knowledge and skills for self reliance and the world of work;
- d. Reduce skill shortages through the production of skilled manpower relevant to the needs of the labour market;
- e. Promote and encourage scholarship, entrepreneurship and community service;
- f. Forge and cement national unity; and,
- g. Promote national and international understanding and interaction.

Development means to make something better than it was, to improve. It is essential to sustenance and growth of any nation. Gboyega (2003) sees development as an idea that embodied all attempts to improve the condition of human existence in all ramifications. Development has connection with production of goods and services within the country above the rate of population growth. It centres on people and their welfare. Development of a nation has to do with good changes that make her become more advanced. The primary objective of development is to benefit people hence there is need for sustainability in every good development.

Sustainable development promotes growth, equity and efficiency in all sectors. Akorede and Onwuka (2008) see sustainable development as a way by which the society is managed in an effective and efficient manner

such that it benefit all and sundry with enough resources still available for the continuation of the human race. The United Nations conference on sustainable development at Rio de Janeiro, Brazil, June 2012 (UNESCO, 2012) defines sustainable development as "development that meets the need of the present without compromising the ability of the future generation to meet their own needs". The conference further focused on equitable and balanced harmonization of the socio-economic, political and environmental goals and objectives at all levels of society to improve the quality of life of the citizens. In other words the principle of sustainability development boarders on issues relating to eradicating poverty and reducing disparities in living. Nigeria needs innovation, new solutions, creating approaches and new way of operation that will be embedded into the curriculum of tertiary education for sustainable development. This assertion is in line with the UNESCO document which calls for re-orientation of the curriculum to provide for Education for Sustainability Development (ESD) thus:

......communities need to identify the knowledge, issues, perspectives, skills, and values central to sustainable development in each of the three components of sustainability – environment, society, and economy – and integrate them into the curriculum. The education community also needs to decide which of the many existing sustainability issues (e.g. biodiversity, climate change, equity, and poverty) will be part of the curriculum. Ideally, efforts to reorient education will be based on national or local sustainability goals. A properly reoriented curriculum will address local environment, social, and economic contexts to ensure that it is locally relevant and culturally appropriate.

Appropriate curricular for tertiary education will help produce students that will have employment opportunity, income generation, contribution to Gross National Product (GNP), fostering innovation, industrialization and technological development. Training of competent and responsible professionals needed for sound macroeconomic and public sector management is their concern. The norms, values, attitudes and ethics that tertiary institutions impact to students are the foundation of the social capital necessary for constructing healthy civil societies and cohesive cultures - the very bedrock of good governance and democratic political system (Harrison and Huntington, 2000). Therefore Tertiary Education needs to undergo significant transformation prompted by the application of new education technologies and the pressure of market forces. This transformation can only be feasible when responsive curriculum is put in place especially in the Tertiary Institutions of learning with curriculum that will reflect;

- Methodological and analytical skill
- More interactive pedagogy with emphasis on learning continuing education programmes
- Humanistic dimension of education and training
- Adaptability and flexibility
- Increased reliance on ICT for pedagogical information, and management purposes

Tertiary education institutions should form a link between knowledge generation and transfer of knowledge to society for their entry into the labour market. They should increase awareness, knowledge, skills and values needed to create a just and sustainable future. Tertiary Education Institutes need to align themselves better with new educational demands and competitive challenges such as programme offering, academic structure and organization, pedagogical processes and mode of delivery, physical infrastructure, and the teaching profession. There is need for tertiary education institutes to respond rapidly to changing labour market signals and adjust swiftly to technological advancement. Tertiary education suppose to engage in inclusive education system which need to impart higher-level skills to a rising proportion of the workforce, foster lifelong learning for citizens, with an emphasis on creativity and flexibility, to permit constant adaptation to the changing demands of knowledge-based economy; and promote.

We are living in a fast-paced world that continues to move even more swiftly. For tertiary education institution to remain relevant to the employment sector, new methods of programme need to be implemented. In business, best products fulfill a need, enhance daily life, or solve a problem for the consumer. In education, industry consumer demand is often neglected. Tertiary education institutions need to change their approach to suit the needs of the modern students. As needs change, programmes must be dissolved at end of life cycle while potentially successful programmes should be launched. Responding to issue of sustainability, tertiary education should

respond to social needs towards a more focus on process and quality of learning which is characterized as creative, reflective and participative. Thinking and planning for the future is an essential and constant ingredient in all human endeavour. Virtually every activity one engages in presumes some future continuation in time.

Slaughter (2008) stated that in learning how present actions will shape future consequences, students gain access to new sources of understanding and action. Curriculum drives what happens in the educational system. Mkpa (1987) opines that curriculum is a vehicle through which the school could strive towards the achievement of educational ends. A responsive curriculum therefore is the curriculum that is relevant to the current and anticipated needs, problems and aspirations of the learner (Emah, 2009). It takes cognizance of vital changes and challenges of the environment and prepares the learner to meet them. This then calls for a rethink into the curriculum outlay. No education system can strive without a relevant and functional curriculum (Nwani, Muruwei & Dute, 2016). Therefore reengineering the educational system for sustainable development must consider re-focusing the existing curriculum at the tertiary level.

Steps to be Taken towards Re-Engineering Tertiary Education for Sustainable Development

- Tertiary institutions should keep a close eye on emerging needs of the workplace.
- Marketing experts need to be brought into the planning process to help strategize academic programmes.

- There is need to consider location and delivery mechanism convenient for the students when planning a programme.
- Changes to adapt for the need of the 21st century student demand research and development; this is because employees' developments have needs to fulfill and choices to make.
- Students need a mechanism to 'prove' what they learned. Emphasis should be on testing and certificate of completion.
- Predictive modeling of programme is necessary in highly competitive market. Research should be a first step in developing programme.
- Looking ahead to career options and focus on industry employment trends and essential skills can help identify the right programme ideas to equip the next graduating class for success.
- Programmes relating to market demand should not take so long to be approved.

Recommendations

- Tertiary education institutions should consider the appropriateness or suitability of content. That is, whether the existing contents of tertiary education curriculum have the capacity of imparting knowledge and skills that will lead this nation to sustainable development.
- The selection or modification of educational objectives to reflect the current and future needs and problems of the society.
- There is need for a flexible and "brutally practical" curriculum structure as a necessary condition for substantial improvement.

- It is necessary to deal with instructional competences to achieve the goals of education that will enhance sustainable development.
- Tertiary education curriculum should properly be re-aligned to meet current demands with effective re-orientation of lecturers in these institutions in terms of methodology.
- Potentially successful new programmes should be launched while failing programmes should be dissolved to free resources.
- There is need for inclusion of sustainability ideas and issues in curriculum, teaching and learning to: improve human health and safety; reduce pollution; conserve resources; protect biodiversity; maintain and maximize the utilization of the physical infrastructure; maintain and enhance the asset base as well as ensure ongoing economic viability.

Conclusion

A holistic and empowering curriculum at the tertiary level is what Nigeria need for higher productivity and sustainable development. This nation need content of instruction that will enable learners to acquire skills, attitudes, interest and knowledge to perform socially and economically work that is beneficial both to themselves and the society. It will make graduates to be relevant, functional and self employed in their areas of specialization. For Nigeria to achieve sustainable development, the curricular will provide for employment creation, utilization of local resources, promotion of technology, diversification of business, capital formation and promotion of entrepreneurial culture. In other words, relevant curriculum at the tertiary education level forms a base for meeting the requirement of re-engineering education system in Nigeria for sustainable development.

References

- Akorede, S. F., Onwuka, A. O. (2008). Managing gender and youth education for sustainable development in Nigeria. Journal of Educational Administration & Planning (NAEAP) 8(1) 95 – 107.
- Cortese, A. D. (2003), "The critical role of higher education on creating a sustainable future", Planning for Higher Education, March-May.
- Dada, A., Kolawole, C. O. O. & Arikpo, P. A. (2003). Making Nigerian educational curriculum more relevant. In Oluremi Ayodele-Bamisaiye, I. A. Nwazuoke and Abiodun Okediran (eds). Education this millennium: innovations in theory and practice. Ibadan, Macmillan.
- Emah, I. E. (2009). Responsive curriculum development. Lagos: Curriculum Organization of Nigeria. pp 35-47
- Federal Republic of Nigeria (2014). National Policy on Education. NERDC Press, Lagos, Nigeria.
- Gboyega, A. (2003). Democracy and development: The imperative of local governance. An inaugural lecture. University of Ibadan, pp. 6-6.
- Harrison, L. E. & Huntington, S. P. (2000). Culture matters - how values shape human progress. New York: Basic Books.
- Huebner, D. (1966). Curriculum as a field of study. In H. F. Robinson (ed) Precedents and promise in the curriculum field. New York: Teachers College Press.

- Igwe, S. O. (2003). Quality and Evaluation of teaching and learning in Nigeria education in B. A. Eheazu, and U. M. O. Ivowi (2003) (eds). Minimum Standard and Accountability in Nigeria Educational System. Proceedings of the 18th Annual Congress of the Academy of Education held at the University of Port Harcourt, 10th – 15th November, 2003 Port Harcourt: The Nigerian Academy of Education.
- Ivowi U. M. O. (2008). Curriculum and the total person, a keynote address delivered at the 21st Annual National Conference of Curriculum Organization of Nigeria (CON) held at NERDC Abuja from 17th – 29th September.
- Lydia C., Rachel C. & Joseph T. (2015). Redesigning Higher Education Curriculum for Sustainable Development http://anienetwork. org/wp-content/uploads/2015/10/ Redesigning-Higher-Education-Curriculumfor-Sustainable-Development.pptx
- Mkpa, M. A. (1987). Curriculum development and implementation. Owerri: Total Publishers Ltd.
- Nakpodia, E. D. (2010). Culture and Curriculum development in Nigerian schools. African Journal of History and Culture (AJHC) Vol. 2 (1).
- Nwani, A., Muruwei, M. & Dute, I. B. (2016). Journal of Curriculum Organization of Nigeria (CON). Vol. 23 No. 4 pp. 200-211

- Nwafor, O. M. (2012). Components of Education for sustainable peace in Nigeria. A lead paper presented at the Biennial Conference organized by Faculty of Education, Cross River University of Technology, Calabar in collaboration with school of Education, Nwafor Orizu College of Education Nsugbe held on the 12th to 16th November.
- Offorma, G. C. (1994). Curriculum implementation and Instruction. Onitsha: Uni-World Education Publishers Ltd.
- Slaughter, R. (2008). Futures Education Catalyst for our Times. Journal of Future Studies. 12(3) pp. 15-30.
- Udofot, M. A. (2005). Implementation of Primary Education Curriculum in Nigeria. Journal of Childhood and Primary Education. 1(1) 17-24.
- UNESCO (2011). World data on education (PDF) http://www.ibe.unesco.org/fileadmin/ user _upload/Publications/WDE/2010/pdfversions/Nigeria.pdf Retrieved 4th May, 2017.

UNESCO (2012). Education for Sustainable Development. Rio de Janeiro, Brazil, June 2012 http://www.un.org/esa/ sustdev Retrieved 4th May, 2017.

Wikipedia. (2011). Sustainable Development https://en.m.wikipedia.org/ wiki/Sustainable_ development Retrieved 5th May, 2017. Educational Extracts ISSN 2320-7612 Vol. VII Issue 1 January 2019 pp. 101-116



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AVAILABILITY OF INSTRUCTIONAL TECHNOLOGIES IN OPEN AND DISTANCE LEARNING IN NIGERIA: POLICY IMPLICATIONS FOR THE SOCIETY AND DEVELOPMENT

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Abstract

Open distance learning is a concept aimed at bridging the time, geographical, economic, social, education and communication distance between student and institution, student and courseware and student and peers. Open distance learning is technology-driven, and the delivery mode is guided by literacy skills and Information and Communications Technologies. Frustrations occur when expectations are not met in terms of availability, accessibility and effectiveness of instructional technologies for driving open distance learning. Other side of the coin which can lead to frustrations is the learners' inability to adapt to usage of instructional technologies in the learning process. The paper investigates the factors that can hinder learners' expectations from being met as well as the availability and accessibility of the instructional technologies in meeting the development of higher education in Nigeria. The aim is to find ways to improve students' learning and the quality of open and distance learning in Nigeria. National Open University of Nigeria was used for the study. The survey research design was used. A sample size of 396 respondents from a population of 59,000 pooled from six study centres was used for the study. Both primary and secondary data comprising review of related literature, questionnaires and interviews were used. The research questions and hypothesis were tested using arithmetic mean with all computations done with SPSS program (E-views 7.0). The study found that the main technologies used by open and distance learning in Nigeria are e-courseware, computer, radio, television, teleconferencing, Internet, CD-ROMS, DVD, VCD, videos tapes. Although problems of affordability and internet connectivity were reported, these technologies, if properly harnessed, have significant effects on the development of higher education in Nigeria. The study recommends subsidy intervention to boost affordability, accessibility and utilisation of instructional technologies in the ODL centres. There should be constant provision of awareness on how to access and utilise the available instructional technologies to ensure high return on investment. Regulators of Internet Service Providers should build policy to ensure strong and constant internet connectivity in the ODL centres in the country.

Keywords: open and distance learning, Instructional technologies, Information and Communications Technologies, e-Learning, higher education, policy

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Introduction

Open and Distance Learning (ODL) has been correctly identified as a panacea for myriad of problems in higher instructions in Nigeria. For one thing, it is inclusive and free of restrictions imposed by distance and space. Moreover, it creates opportunities for those denied admission into universities because of lack of adequate classroom space, gender, age or social or economic status. ODL also makes education accessible to those who are unable to study full time due to their social responsibilities and commitments (ACDE, 2012; Omolewa, 2014).

Open and distance learning is most relevant in places where access to learning is limited at various levels. Perhaps, no other country in the world needs more urgent access to quality education than Nigeria. This situation is adversely affecting the country's human resource development, thereby making it less competitive, less resourceful and ill-equipped to assert itself in the global community. All these issues demand that education in Nigeria must be stepped up if the country is to realize its potential, (The World Bank, 2013).

Owen (2013) opines that contemporary social realities do not reflect the policy expectations of the higher education subsector in Nigeria. According to him this sub-sector has been consistently bedeviled by a myriad of challenges such as poor technology, weak policy choices, lack of follow-through in implementing policies, extreme corruption and severe underfunding (Easterly, 2015; Oyelere, 2013; Aigbokhan, Imahe & Ailemen, 2014). These challenges have grossly affected access to higher education in Nigeria in terms of quantity and quality. Despite these, the role of higher education in socio-economic development of nations and individuals remains incontrovertible (Bloom, Charming and Cann, 2011).

The root of the problems facing the higher education institutions in Nigeria is multifarious, though interrelated. The inability of higher education institutions to meet the rising demand for admission places is due, on one hand, on an increase in population of higher education-aged persons, and on the other hand, to the changing context of higher education in the 21st century, which has greatly challenged the notion of single-stream HE for life (Lee, 2010). The shelf-life of knowledge has contracted so sharply such that, everyone now requires some form of continuing education or another to up-date, re-tool, "upskill or re-skill" extant knowledge in their specific vocational areas, in order to meet the challenges of the contemporary society (Dore, 2011: 119; Omolewa, 2013:297). This has resulted in the necessity to re-enter Higher Education Institutions (HEI) to improve their knowledge and empower them to conform to or cope with the requirements of the contemporary globalized society (Baijnath et al., 2013).

Statement of the Problem

Open and distance learning is technology-driven, and the delivery mode has always been guided by literacy and ICT skills, computers, radio, television, and increasingly now web based course wares and by the Internet. According to Papert (1993) the computer is an appropriate tool

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to allow learners to become motivated, critical thinkers, problem-solvers and metacognitionists. This proves the link between constructivism and Cognitivism.

The overall mission of open and distance learning is to give learners the opportunity to "work, learn, and study whenever and wherever they want". According to Johnson, Smith, Willis, Levine, and Haywood, (2011:3), students experience frustration when this expectation is not met. A lot of things can hinder these expectations from being met such as inadequate instructional technologies, poor ICT skills, lack of steady power supply, poverty which makes it difficult for the learners to acquire the necessary learning tools, lack of capacity or skills on the part of facilitators in designing course-wares in electronic format, low level of Internet connectivity, and low tele-density. These cause frustration and disappointment in students. The paper, therefore, investigates the availability, accessibility and effectiveness of instructional technologies in development of higher education in Nigeria via open and distance learning.

Objectives of the Study

The broad objective of this study is to investigate the availability, accessibility and effectiveness of instructional technologies in developing higher education in Nigeria using open and distance learning platform.

The specific objectives include:

- 1. To examine the availability of the instructional technologies.
- 2. To investigate the accessibility of ODL instructional technologies.
- 3. To investigate the effectiveness of the utilization of ODL instructional technologies.

4. To investigate the factors which hinder the availability, accessibility and utilization of instructional technologies.

Research questions

- 1. What technological facilities are available to support learning?
- 2. To what extent are the instructional technologies accessible by the students?
- 3. How effective is the utilization of the instructional technologies in learning?
- 4. Is there any hindrance on the availability, accessibility and utilization of instructional technologies?

Research Null Hypotheses

- H0: Instructional technologies are not available for ODL higher education in Nigeria.
- H0: Instructional technologies are not accessible for ODL higher education in Nigeria.
- H0 Instructional technologies are not effective for ODL higher education in Nigeria.
- 4. H0: There is no hindrance to availability, accessibility and utilization of instructional technologies for ODL higher education in Nigeria.

Review of Related Literature

This is categorized into three stages; conceptual clarifications, theoretical framework and empirical related literature on the subject matter.

Conceptual Framework

Open distance learning: is a multidimensional concept aimed at bridging the time, geographical, economic, social, educational and communication distance between student and institution, student and academics, student and courseware and student and peers. Open distance learning focuses on removing barriers to access learning, flexibility of learning provision, student centeredness, supporting students and constructing learning programmes with the expectation that students can succeed.

Instructional Technology is a tool or technology used to support instruction and learning. Seels and Richey (1994) defined Instructional Technology as "the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning" The five domains within the definition, include design, development, utilization, management, and evaluation. They are the foundations for practice in the field. While each domain has its own knowledge base, the domains "contribute" to each other and have a "synergistic" relationship (Seels & Richey, 1994, p. 25). Instructional technology is about pedagogy, about building community, about collaboration and helping each other imagine and realize teaching and learning goals with the assistance of technology. Examples of some instructional technologies are;

Type Print	Examples Pamphlets, handouts,
Visual	study guides, manuals Charts, real objects,
	photographs,
Audiovisual	transparencies Slides, tapes, films,
	filmstrips, television,
Static/display	video, multimedia Chalkboard, feltboard,
	display easels, flip charts,
	cloth board, magnetic
	board
Electronic	Radio computers, e-mail,
	CD-ROM, multimedia

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In open and distance learning students can learn anywhere and anytime across the globe through the use of ICT tools which include:

- 1. Computer: This is an electronic device that is capable of receiving, storing, manipulating and retrieving data speedily and efficiently (Asogwa, 2014). The availability of the hardwares and softwares help the learner to choose instructional materials that meet his/her needs. The computer is an educational technology medium for individualizing instruction. It, therefore, renders excellent service in ODL both as a tutor and as a tool.
- 2. The Radio: Open and distance learning programmes can be transmitted through the use of radio and this helps to create access. Open and distance institutions use radio to disseminate information, counseling and to facilitate their courses at specific hours. Since radio broadcast can be received even in very remote areas, then it becomes an important tool in ODL.
- 3. Television: Open and distance learning makes use of television as an important medium to disseminate information to learners. Television broadcast can be in the form of live broadcast where educational events are directly telecast or recorded broadcast where prerecorded programmes are telecast per transmission scheduled for the convenience of the producer and the students (Holmberg, 2007).
- 4. Teleconferencing: The use of the teleconferencing facilities allow many people to be simultaneously connected so that discussion can take place even

though the participants do not meet. It is particularly useful when the teacher and the students are widely dispersed and separated because of geographical location (Mugridge, 1991).

- 5. Networking: This is a communication system that links together computers, storage devices, word processors, printers, the telephone system and other electronic devices. ICT networks assist the exchange of information between people and institutions (Lucey, 2015). ICT-based networking that can be employed in open and distance learning is Internet/world wide web (www).
- 6. Internet: is a global network consisting of millions of computers and data bases. It is a network of many computer networks. The Internet has the ability to deliver multimedia materials and this quality makes it highly suitable for ODL. The educational uses of the Internet include e-mail, facsimile (Fax), file transfer, browsing and dissemination of educational/academic information e.g. conferences, newsgroups, chat room (messaging), institution/classroom home page, research activities, and e-learning/ e-evaluation of students' performance.
- 7. The Internet/World Wide Web: facilitates people in communicating and accessing remote information from global sources and, therefore, removes the constraints of time and distance. The World Wide Web (www) is a system of Internet servers that allows access to specially arranged documents formatted in hypertext markup language (Lucey,2015).
- 8. CD-ROM/DVD: This involves the use of video tapes or video discs designed in

such a way that they respond to choice made by the individual users. It is a very effective tool for conveying information (Asogwa, 2013).

Policy for ODL

The ODL policy is focused on pursuing affordable quality higher education and lifelong learning through open, online, flexible and technology-enhanced education. It is designed to give access and opportunities to all citizens to acquire formal education and overall personality development especially to the deprived community, women and working people through distance mode. Its overall objectives include;

- 1 Expanding access to education to learners of diverse needs
- 2. Improving quality of conventional education
- 3. Promoting continuing education and professional development
- 4. Establishing a system of knowledge and skill certification and
- 5. Learner Support services

ODL is structured to offer all kinds of academic support and technical backstopping to the faculties and study centers such as library facility, counselling, course material delivery, student orientation, facilitations etc. Also effective and extensive use of instructional technologies should be available such as mail; telephone; internet; e-mail; tele conferencing/video conferencing etc.

Theoretical Framework

ODL has a number of defining features, including the separation in time and space of teacher and learners, industrialized processes, scalability and cost efficiency; and the use of technology for learning, flexibility and reach. Warschauer, (2010). Moore & Kearsley (1996) maintain that distance educators should provide for three types of interaction: a) learner-content, b) learnerinstructor, and c) learner-learner.

Learner - Content Interaction:

According to Moore et al (1996), a major role of the distance educator is to present appropriate content and promote interaction between this content and the learner in ways that will cause the learner "to construct knowledge through a process of personally accommodating information into previously existing cognitive structures".

Learner - Instructor Interaction:

Moore et al (1996), believe that most learners regard learner-instructor interaction in distance learning environments as essential. The instructor's role is to present content and then maintain the learners' motivation and interest, while assisting them as they interact with the content. The instructor's responses to learners' application of content are seen as especially valuable, as they provide constructive feedback concerning learners' achievement of instructional objectives.

Learner-Learner Interaction:

Moore et al (1996), describe learnerlearner interaction in distance education as "inter-learner interaction between one learner and other learners, alone or in group settings, with or without the real time presence of an instructor" (p. 131). They point out that younger learners may find this more stimulating and motivating than adult and advanced learners. This study examines the appropriateness of using Moore and Kearsley's (1996) distance learning interaction model to examine the relevance of the ODL instructional technologies on the learner as regards availability, accessibility, and utilization of these technologies.

Empirical literature

According to Alexander (2006) and Bryant (2006), instructional technologies supports a social constructivist view of learning that enhances students' ability to learn and apply course content in context with other students. Naimie, Siraj, Ahmed Abuzaid, & Shagholi, (2010), believes that when technology are integrated in instructional materials, possibilities for creating learning activities that engage student's multiple learning styles are greatly enhanced. This is collaborated by studies done by Chen, Lambert, & Guidry, (2010; Nelson Laird & Kuh, (2005). Also, Zywno and Waalen (2002), the result of which showed positive correlations between the use of instructional technology and student engagement especially in collaborative discuss. They also argue that instructional technologies enhance academic performance in students across learning styles especially in classes that combine ICTs with faceto-face traditional learning. Cobcroft, R. S., Towers, S., & Smith, J. (2006), argues that instructional technologies increase the engagement of students by intersecting learning styles.

Dew, (2010) as quoted by Rossing, Miller, Cecil, & Stamper (2012) in their studies argues that one of the principal features of instructional technology in
learning is the flexibility for students to engage in the educational process and material anywhere and anytime thereby enhancing the desirable features of distance learning. Instructional technologies address a modern need for convenience, like the option of downloading learning resources in an increasing number of electronic formats (Fallaize, 2010).

Another very important thing in open and distance learning is the instructional design and its comfort with technology (Armstrong, 2011; de Winter, Winterbottom, & Wilson, 2010; Enriquez,2010; Shuler, Hutchins, & LaShell, 2010; Yang & Lin, 2010).

Rossing et al (2012) quoting Armstrong, (2011, p. 224), stated that students have attributed negative qualities to instructional technology due to ineffective instructional design and learning activities. They opine that a significant amount of the potential for success in using new technology is dependent upon the instructor. According to them, a study on the perceptions of students and teachers on the affordances of new technology found that supporting teachers in integrating technology into teaching can contribute to useful pedagogical outcomes (de Winter et al., 2010). They argued further that researchers found that new technologies (wikis, digital video, podcasts, game consoles, and tablet computers) can support social construction of learning, assessment, motivation, and engagement in learning for students (de Winter et al.,2010; Enriquez, 2010). Students have also reported that using tablet computers in class foster productive collaborative learning and improve interactions with peers and instructors (Shuler et al., 2010).

Research on the use of ICTs in distance education in the Nigerian context is relatively new and limited for the simple reason that ICT in distance education in the country is a relatively recent phenomenon. In three separate workshops organized by COL on the use of ICTs in Commonwealth countries, Nigeria did not feature as one of the countries in 2000, 2002, and 2003 (COL, 2014).

Distance education in Nigeria dates back to early 1960s when it was in the form of correspondence education (Omolewa, 2010). Today, there are a number of dual mode institutions that includes the Distance Learning Institute (DLI) of the University of Lagos. Although the institute started with producing its course materials in print format, it currently runs face-to-face lectures for its students for specified periods in the year. Others are Centre for Distance Learning and Continuing Education (CDLCE) of the University of Abuja, Distance Learning Centre (DLC) of University of Ibadan, and Distance Learning Centre of the Obafemi Awolowo University, Ile Ife. The National Teachers' Institute (NTI), Kaduna, is a single mode institution which was established to provide training and upgrading for primary and secondary school teachers and the National Open University of Nigeria (NOUN).

Area of Study

The National Open University of Nigeria (NOUN) was established in1983 to actualize the following objectives: -Enhance Education For All (EFA) and life-long learning; - Provide instructional resources via an intensive use of information and communication technology; and -Provide flexible, but qualitative education. The National Open University of Nigeria is regarded as the foremost university providing highly accessible and enhanced quality education anchored by social justice, equity and national cohesion through a comprehensive reach that transcends all barriers and also provide functional cost effective, flexible learning which adds life-long value to quality education for all who seek knowledge. The NOUN is an equal opportunity institution, providing access to qualitative education for those whose aspiration for higher education is not met by the conventional systems and/or those who preferred the open and distance learning (ODL) mode of instruction due to their peculiar circumstances. The choice of this institution for this study is that it makes maximum use of e-learning and mobile education via information and communication technology to bring knowledge to all those who aspire to acquire knowledge and life-long learning.

NOUN instructional deliveries are provided through any or a combination of the following:

- 1. Specially designed and packaged print materials;
- 2. Practical classes and Internship;
- 3. Face to face interaction at the Study Centers aided by instructional facilitators;
- 4. Video and audio tapes;
- 5. CD ROMs, VCD, DVD, and
- 6. Web-based delivery.

Students interact more with their course materials which are specially developed to provide opportunity for 'student-tutor' interaction in a teaching-learning process. The instructional technologies which effectiveness is being examined in this study is limited to audiovisual and electronic technologies such as Videos, audio tapes, CD ROMs, VCD, DVD, Radios, Television, electronic mails, Web-based delivery.

Sources of Data

This study was carried out in six study centers of the NOUN taken from six geopolitical zones. These are Awka, Bauchi, Gombe, Ijeka, Nasarawa and Uyo study centers. Structured questionnaire on e-learning platform were used in collecting the primary data for the analysis.

Population/Sampling Techniques

The population of year 1 and 2 students from 6 Study centers.

S/N	Study Centers	Population
1.	Awka	9,072
2.	Bauchi	8,540
3.	Gombe	9,167
4.	Ikeja	20,501
5.	Nasarawa	4,520
6.	Uyo	7,200
Total		59,000

Field survey, 2017

Yamane(1967:886), formula was used to calculate the sample sizes at 95% confidence level where p=0.5. The formula is as follows:

$$n = N$$

 $1 + N(e)^2$

n=1+59,000(0.05x0.05)=59,000/1+148= 59,000/149 = 396

Where:

N= the population size, 1= is constant, e= the degree of error expected and n= the sample size To make for possible non- respondents, 450 copies of questionnaires were distributed.

All students who participated in this study were eligible however participation was voluntary and anonymous.

Survey Instrument

A self-reported paper-based questionnaire was designed containing closed and open ended questions to capture relevant data. The measuring instrument in this study is a 4 point Likert scale having options ranging from strongly agree (4) to strongly disagree (1). The open ended questions were content analyzed for input into the discussion of findings.

Pilot Test

A pilot test was conducted on a sample of about 15 randomly selected respondents to test the validity and reliability of the designed questionnaire. The observations of the respondents were used to modify the questionnaire.

Validity and Reliability

The content of the questionnaire for this study was validated by content experts. Data from the pilot study were subjected to a reliability test with the average Cronbach alpha coefficient of the constructs under focus as 0.91, suggesting a very high reliability for scale.

Limitations of the Study

This study is limited to the sample size taken from 6 study centers of NOUN taken from six geo-political zones of Nigeria. The study did not cover all the study centers. This therefore limits the degree of generalizations that could be made from the findings of the study.

Methodology

Descriptive statistics was used to analyze data. In the analysis, the responses in the questionnaire were first extracted from the questionnaire, coded, and fed into an Excel spreadsheet and the resultant data exported into SPSS computer software program known as E-views 7.

The survey instrument comprised two sections. Section A is on the demographics of the respondents while section B is on the variables of the topic of the study. The research questions were tested with Arithmetic Mean, the research hypothesis was tested with the Spearman Rank Correlation Coefficient (with Fisher z Transformation for large samples). Arithmetic Mean is given by the formula. X $\sum f x \sum f x$

= n n, where x = Arithmetic Mean, $\sum fx$ = sum of the product of observations and the 4-point scale, and N = number of items.

Decision Rule:

- Reject null hypothesis, if the calculated Grand Mean (x) is greater than or equal to the rating score average (2.5), i.e x ≥ 2.5.
- 2. Accept null hypothesis, if the calculated Grand Mean (x) is less than the rating score average (2.5), i.e. x < 2.5.

Analysis of Data

The quantitative analysis of the data was conducted using Statistical Package for Social Sciences (SPSS). Survey responses were manually scored (Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1) and entered into a SPSS database.

Student responses to the open-ended questions were compiled and recorded in an Excel spreadsheet. Following Creswell's (2003) description of several strategies encouraged to ensure the qualitative study's rigor and credibility, two investigators reviewed the open-ended responses **Test of Research Hypotheses**

Table 1

independently and generated a preliminary coding rubric to categorize recurring themes in the data.

S/N	Questionnaires item	SA	А	D	SD	τοται	N	MEAN (X)	DECISION
		4	3	2	1	TOTAL	1		
1.	Computers are available at the study centres	(140) 560	(110) 380	(90) 180	(56) 56	1176	396	2.97	Strongly Agree
2.	e-learning (I-learn) platform is vailable The internet	(130) 520	(100) 300	(80) 160	(86) 86	1066	396	2.69	Strongly Agree
3.	facilitates are available in the study centers	(120) 480	(100) 300	(90) 180	(86) 86	1046	396	2.64	Strongly Agree
4.	CDROMs, audio/ video tapes/e-course wares are available to students	(110) 440	(90) 270	(80) 160	(116) 116	986	396	2.50	Agree
	GRAND MEAN (X)	2.7							Strongly Agree

Availability of instructional technologies for Open Distance Learning

Field Survey, 2017

Table 1 above shows the opinion of respondents in terms of availability of instructional technologies in the system. From the table, it was generally opined that computers, e-learning platforms, internet facilities, CD ROMS, audio/video as well as tapes/e-course wares are available for students' use at the designated Open Distance Learning centres. Since the grand mean (2.7) is greater than the rating score average (2.5) we reject the null hypothesis and conclude that availability of instructional technologies is not a problem in the Open and Distance Learning Centres under consideration.

Table 2

		C A		D	CD			1.6	
S/N	Questionnaires item	SA	А	D	SD	Total	Ν	Mean	Decision
	Questionnaires item	4	3	2	1	Total		х	
5	There is internet access in the	(150)	(120)	(90)	(30)	11/2	206	2.05	Strongly
5.	university library	600	360	180	30	1145	390	2.95	Agree
6.	Digital/virtual library is available to students on campus	(140) 560	(110) 330	(100) 200	(46) 46	1136	396	2.87	Strongly Agree
7.	Computers and laptops are available in the campus library	(170) 680	(97) 291	(123) 246	(6) 6	1223	396	3.09	Strongly Agree
8.	conferencing are available on campus	(142) 568	(111) 333	(94) 188	(49) 49	1138	396	2.87	Strongly Agree
GRA	AND MEAN (X)	2.9							Strongly Agree
	~								

Source: Field Survey, 2017

Table 2 above shows the degree of accessibility of the available instructional technologies to the students at the Open Distance Learning Centres under consideration. From the table, all the instructional technologies can be assessed by students. We hereby reject the null hypothesis and conclude that students have access to instructional technologies when they want to make use of them. Thus, access to instructional technologies cannot be counted among the problems hindering learning at the Open and Distance Learning centres under consideration.

Table 3

Effectiveness of the Instructional Technologies at the Open Distance Learning Centres

55	0			J		1			0
S/N	Questionnaire Item	SA	А	D	SD	ΤΟΤΛΙ	N	MEAN	DECISION
3/11	Questionnaire Item	4	3	2	1	IOIAL	IN	(X)	DECISION
	Desktop/laptop/CD-								
0	ROM/Video tapes	(132)	(106)	(100)	(58)	1104	206	2 70	Strongly
9.	utilization is very	528	318	200	58	1104	390	2.19	Agree
	effective								-
	Digital projector/								
10	interactive audio	(138)	(116)	(95)	(47)	1127	306	2 87	Strongly
10.	conferencing is very	552	348	190	47	1137	390	2.07	Agree
	effective								
	Internet network in the	(141	(102)	(120)	(33)				Strongly
11.	study centers is very	564	306	240	33	1143	396	2.87	Agree
	effective	504	300	240	55				rigiee
	GRAND MEAN (X)	2.9							Strongly
		,							Agree

Table 3 above shows the opinions of respondents on the effectiveness of the instructional technologies being used in NOUN. From the table, it was highly perceived that the instructional technologies Table 4 are very effective. Since the grand mean (2.9) is greater than the rating score average (2.5), we conclude that there is high level of perception that the available instructional technologies in NOUN are effective.

Hindrances to Availability, Accessibility and Effective Utilization of Instructional Technologies

S/No.	Questionnaire Item	Sa 4	A 3	D 2	Sd 1	Total	N	Mean (X)	Decision
12.	Poor technological skills	(126) 504	(147) 441	(109) 218	(14) 14	1177	396	2.97	Strongly agree
13.	Insufficient finance to buy the needed technological infrastructures	(71) 284	(90) 270	(130) 260	(105) 105	919	396	2.32	disagree
14.	Lack of orientation on the use of the technologies	(133 532	(108) 324	(140) 280	(15) 15	1151	396	2.9	Strongly agree
15	Poor or non availability of internet connectivity	(28) 112	(143) 429	(129) 258	(96) 96	895	396	2.26	disagree
	GRAND MEAN (X)	2.6	>	0					Strongly Agree

Table 4 above shows that opinions of respondents regarding the hindrances on the availability, accessibility and utilization of instructional technologies in NOUN. From the table, two hindrances to availability, accessibility and utilization of instructional technologies were identified by the respondents:

- Insufficient finance to buy the needed technological infrastructures
- Poor/weak internet strength

From the above, we can conclude that though the students have good technological skills and good orientation on how to use the instructional technologies, effective learning is still hindered by insufficient funds and poor internet connectivity. Thus for the available instructional technologies to aid effective learning in the ODL centres, there is need to make sufficient fund available for acquisition of the required technological infrastructure. The regulators of Internet Service Providers should be involved to ensure that the internet connectivity strength is constantly strong enough to support the facilities at the ODL centres.

Discussions on findings:

The respondents' opinions in terms of availability of instructional technologies in the system were that computers, e-learning platforms, internet facilities, CD ROMS, audio/video as well as tapes/e-course wares are available for students' use at the designated NOUN's Open Distance Learning study centres.

They also opined that all the instructional technologies can be assessed by students

especially when they are at the study centres but this is not so immediately they leave the study centres. Thus, access to instructional technologies can be counted among the problems hindering learning at the Open and Distance Learning institution in Nigeria. Added to this, some respondents expressed limitation on access to e-courseware, portal, social networking when the university server is down.

On the effectiveness of the instructional technologies, the respondents opine that the instructional technologies in NOUN are very effective.

However, the opinions of respondents regarding the hindrances on the availability, accessibility and utilization of instructional technologies in NOUN, revealed two hindrances to availability, accessibility and utilization of instructional technologies:

- Insufficient finance to buy the needed technological infrastructures
- Poor/weak internet strength.

Some of the respondents informed that they cannot afford to buy the required technological tools and internet data. Some students expressed frustration with technological learning and requested for training on computer literacy before using the technological tools.

Another major inconvenience is connectivity. Some students commented on "slow connections," "internet issues," "problems staying online," and other variations that clearly signalled how vital high speed Internet access is for the utility of these technologies.

Conclusion

Information technology is very crucial in the dissemination of knowledge in Open and Distance Learning Institutions. This being the case, the ability of the students to operate the computer to solve problems is very important to their learning and has the potential to impact positively to their overall knowledge and skill acquisition. As observed from the findings, acquisition of the technology also appears to be a major factor in how well students learn and use the learning tools. Many of the rural dwellers in open and distance learning complain of inadequate basic and infrastructure connectivity.

National Open University of Nigeria (NOUN) is using asynchronous communication approaches i.e. self learning, printed materials, audio/video, radio, teleconferencing and CDs as instructional technologies. In recent times, the university is restructuring towards synchronous delivery methods.

Recommendations

There is need to devote some time to orientation to allow students to get used to the technologies in use in ODL. Allocating time for students to experiment with the devices, navigate to different applications, and help one another with interface questions appeared to mitigate frustrations with the learning curve. Educators must continually gauge students' level of knowledge and comfort with Information and Communication Technologies, and they must not assume that students are prepared for the technologies. As learners desire the ability and flexibility to choose their location and time of learning, ownership of personal technology will enhance their learning. To assist indigent learners acquire the necessary technological tools, sharing cost between the institution and the students will reduce this burden and encourage more enrolment in Open and Distance Learning. Government at state or federal level can equally assist indigent learners by providing them with all the required facilities.

Open and Distance Learning policy makers must ensure that instructional designers are comfortable with ODL tools and environment as they are with classroombased instruction. If they are not, they cannot make sound decisions about delivery media selection. Some fundamental principles are; (a) needs identification and analysis of the course to determine the desirable learning outcomes; and (c) accessibility of instructional/learning resources, including technology-based resources, by both learners and tutors.

Subsidy intervention is recommended to boost affordability, accessibility and utilisation of instructional technologies in the ODL centres. There should be constant provision of awareness on how to access and utilise the available instructional technologies to ensure high return on investment. Regulators of Internet Service Providers should build policy to ensure strong and constant internet connectivity in the ODL centres in the country.

Finally, in order to harness the inherent benefits of open and distance learning,

there is need for regional collaboration in Nigeria. The educational regulatory body in Nigeria need to establish policies, rules and regulations that allow for creation of a critical ODL administrators who are able to leverage the skills, knowledge and expertise available for this mode of learning. It is also important to recognize the role of strategic management in an environment where the balancing of scarce resources and rising needs and expectations have to be managed together with the increasing clamour for relevance and legitimacy. Ostensibly, ODL management should now be specialized and the collegiums idea of classical university systems jettisoned.

References

- Aigbokhan, B., Imahe, O.J. & Ailemen, M.I. (2015). Education expenditure and Human Capital development in Nigeria: Any Correlations So Far? Retrieved from www.regionalstudiesasssoc.ac.uk/events/ aalborg05asigbhokhan,pdf, July 12, 2016.
- African Council for Distance Education-ACDE (2012), Open and Distance Education for Sustainable Development, Lagos: SMARK Press.
- Asogwa, U.D. (2014). 'E-Learning: A panacea for access, equity and quality in higher education in Nigeria'. In J.B. Babalola, A.O. Akpa, A.O. Ayeni & S.O. Adedeji (eds) Access, Equity and Quality in High Education. Ondo: NAEAP Publications.
- Alexander, B. (2004). Going nomadic: Mobile learning in higher education. Educause Review,39(5), 6.
- Armstrong, D. A. (2011). Students' perceptions of online learning and instructional tools: A qualitative study of undergraduate students use of online tools. Turkish Online Journal of

St. Thomas College of Teacher Education, Pala, Kerala

Educational Technology - TOJET, 10(3), 222-226.

- Bansavich, J. C., & Yoshioka, K. (2011). The iPad: Implications for higher education. Paper Presented at the 2011 EDUCAUSE Annual Conference, Philadelphia, PA. Retrieved November 4, 2011, from
- http://www.educause.edu/sites/default/files/ library/presentations/E11/SESS050/ipadIm plications%2Bfor%2BHigher%2BEducati on.pdf
- Carver, C. A., Jr., Howard, R. A., & Lane, W. D. (1999). Enhancing student learning through hypermedia courseware and incorporation of student learning styles. Education, IEEETransactions on, 42(1), 33-38
- Chen, P.-S. D., Lambert, A. D., & Guidry, K. R. (2010). Engaging online learners: The impact of Web-based technology on college student engagement. Computers & Education, 54(4), 12221232. doi: 10.1016/j. compedu.2009.11.008
- Cobcroft, R. S., Towers, S., & Smith, J. (2006). Mobile learning in review: Opportunities and challenges for learners, teachers, and institutions. Proceedings of the Online Learning and Teaching Conference 2006, 21-30.
- Baijnath, N., Maimela, S.S., and Sing, P. (2013), Quality Assurance in Open and Distance Learning, Technikon, SA.: UNISA.
- Bloom, D., Canning, D. and Cann, K. (2011), Higher Education and Economic Development in Africa, Harvard, Cambridge: Cambridge University Press.
- Commonwealth of Learning (2013) Identifying barriers to ICTs in education based on gender differences. Forum on ICTs & Gender: Optimizing Opportunities. Kuala Lumpur: The Commonwealth of Learning.

- Commonwealth of Learning (2012) Identifying Barriers Encountered by Women in the Use of Information and Communications Technologies (ICTs) for Open and Distance Learning in Africa, Zanzibar, Tanzania: The Commonwealth of Learning, the Acacia Initiative, and International Development Research Centre.
- Daniel, John, Paul West and Wayne, Mackintosh (2012) Exploring the role ICTs in addressing educational needs: Identifying the myths and the miracles. Presented at NADEOSA 1 0th
- Easterly, K. (2015), Open and Distance Higher Education in Africa, London: Longman.
- Holmberg, B. (2007). Distance Education; A Survey and Bibliography, London; Koyan Page.
- International Telecommunication Union (2013) ICT Statistics by Country. Available at www. itu.int/ITU-D/it/statistics. Retrieved on July 20, 2016.
- Johnson, O.A. (2012) Enhancing quality in higher education through information and communication technology in Nigeria, In J.B. Babalola, G.O., Akpa, A., O.Ayeni & S.O. Adedeji (eds) Access, Equity and Quality in Higher Education. Ondo: NAEAP Publications.
- Kaufman, K., Waikins, R. & Guera, I. (2000). The future of distance learning: defining and sustaining useful results. Education Technology. 41(3), 19-26.
- Lee, M.N.N. (2011) Higher education in Southeast Asia in the era of globalization (Electronic Version). In Forest, J.J.F, &altbach, P.G. (Eds.), International Handbook of Higher Education (539-555) Netherlands: Springer.
- Levy, F. & Murnane (2004). The New Division of Labor: How Computers are Creating the Next Job Market. New Jersey: Princeton University Press.

- Lucey, T. (2015). Management Information System (9'h Edition). New York: Book Power.
- Materu, P. (2007) Higher Education Quality Assurance in sub-Saharan Africa: Status, Challenges, Opportunities, and Promising Practice. Washington D.C.: World Bank
- Matthew, A.G. (2013). Open and distance learning for enhanced access and balanced development, In J.B. Babaiola, G.O. Akpa, A O. Ayeni & S.O. Adedeji (eds) Access, Equity and Quality in Higher Education, Ondo: NAEAP Publication,
- Mugridge, I, (1991). Distance education and the teaching of science, Impact of Science on Society 4(14). 313-323.
- Ngome, C. (2013). Kenya, In Teferra, D. & Altbach, A. (eds.), African Higher Education. Bloomington; Indiana University Press.
- Onyelere, O. (2013), Evolving a national policy on distance education: An agenda for implementation, Education Today, 8 (3), 14-29.
- Omolewa, M. (2014), Thinking open and distance learning for development in Africa. Conference Proceeding: Open and Distance Learning for Sustainable Development, 40(4), 1-6.
- Obanya, P. (2013). Contemporary concerns and the African school curriculum: Keynote Address. Nigerian Journal of Curriculum Studies. 11 (I), 3-9.
- Okebukola. P. (2005). Quality assurance in the Nigerian university system. Keynote address Presented at the 2005 Fellowship Seminar / Award of the Curriculum Organization of Nigeria held at the University of Jos, Nigeria on 6 April, 2005.
- Onuma, N. (2007) Utilization of information and communication technology in schools: Problems and suggestions, In J. B, Babaiola,

St. Thomas College of Teacher Education, Pala, Kerala

G. O. Akpa, A. O. Ayeni & S. O. Adedeji (eds) Access, Equity and Quality in Higher Education. Ondo: NAEAP Publications.

- Pityana, B. & Baijnath, N. (2015). Steering, Forging and Planning a Comprehensive Mega-University: The Case of the University of South Africa. Paper presented at the AAOU Conference, Delhi.
- Said, M.E. (2010). Higher Education in Egypt. Ministry of Higher Education Projects Implementation Unit. (Online) Available:
- http:ec.europa.eu/education/programmes/ tempus/countries/higher/egyt.pdf (2007, January 21).
- Said, M.E. (2013). Egypt. In Tefera, D. & Altbach, A. (eds.) African Higher Education. Bloomington: Indiana University Press.
- The World Bank (2013), Higher Education: The Lessons of Experience Washington D.C.: World Bank.
- The World Bank (2005), Towards Knowledge Societies, Washington D.C.: World Bank..
- UNESCO (2002). Open and Distance Learning: Trends, Policy and Strategy Consideration, Paris: UNESCO.