Stakeholders' Assessment of Basic Science Programme Objectives in Southwestern-Nigeria

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Abstract

Helping to gain better understanding of the world puts science in a better position to influence positively, conditions for life on planet. Therefore, having the necessary science background and knowledge goes a long way to affect people's life positively. Hence, children are taught science early so as to develop the critical thinking skills necessary to sort through all the information that they will be bombarded with in their lives, and make intelligent decision about what to believe and how to value their world and environment. Basic science that is taught in schools has evolved as a process of gradual curriculum reform in science. This study carried out an assessment of the Stakeholders' rating of Basic Science Programme Objectives. Participants were ministry officials (33), principals of schools (89), year tutor/heads of department (166) and classroom teachers (269) selected by stratified random sampling techniques from Southwestern-Nigeria. The instrument engaged was Science Programme Objectives Rating Scale with reliability coefficient (r = 0.72). Findings shows that Stakeholders rated the objectives to be very good ($\bar{x}$ = 3.76). However, the dynamic nature of Science necessitates continual assessment of the programme objectives from time to time.

Keywords: Assessment, Basic Science, Objectives

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Introduction

Science has been described as one of the greatest weapons human has ever invented for leaping into the unknown phenomenon. It has also been described as the language of nature, without which communicating with the world, within or outside becomes impossible. A good background in Science enables people to quickly learn and understand how things around them work. Hall-Rose (2004) asserts that people need to master a minimum amount of scientific and technological knowledge to understand the world around them. Having the necessary science background and knowledge goes a long way to affect people's life positively. It is therefore pertinent, that every individual, young, old, male or female be scientifically literate in order to have a better survival. This has made the study of science and technology (which grows out of scientific discovery) indispensable to the survival of every individual on the one hand, and on the other hand an integral part of the culture of a nation, which has to be sustained, developed and passed on to incoming generations. Basic science that is taught in Nigerian schools has developed as a process of gradual curriculum reform.

The introduction of science into the Nigerian school system dated back to the time of the Christian missionaries who brought western type of education to Nigeria. The teaching of science was, however, delayed by the missionaries and the colonial administrators for obvious reasons. One of which was because the motive for colonization was essentially trade, the issue of science education could not have arisen. Another reason for non-introduction of science was the erroneous belief that Africans were inferior human beings and as such not capable of understanding science. Hence, what existed between 1895 and 1920 was the teaching of only Biology-related subjects like Physiology, Nature study and Botany in a few mission schools [Science Teachers Association of Nigeria Newsletter, 1970]. Later, General Science was taught at the Post- Primary Institutions.

According to Taiwo (1975), General Science later disintegrated to the three basic science disciplines, but General Science as a course was retained and taught to lower class as a science course for less able, the least science oriented and those who do not wish to pursue science beyond the secondary school level. Attempt was also made to teach it to higher classes but the point against it was that it was the joining of subjects that are naturally different. It was in the midst of this confusion that the euphoria of integration globally caught up with the Science Teachers Association of Nigeria (STAN), thus leading to the dramatic birth of Nigerian Integrated Science Project (NISP). This inherited confusion, along with other factors such as lack of enlightenment and trial testing, led to the erroneous belief in some quarters that Integrated Science was the old General science 'rechristened'. Nigeria then had to move with the global curriculum changes from the old Nature study and Hygiene through General Science to Integrated Science. Integrated Science then was supposed to lay foundation for subsequent science in the future.

Nigeria as part of the global deliberations on Education for All (EFA) reflected her response in the national education policies and programmes of attaining the Millennium Development Goals (MDGs) by 2015 and the critical target of the National Economic Empowerment and Development Strategies (NEEDS) decided to introduce the 9-year Basic Education programme. Basic Science and Basic Technology as teaching subjects have therefore been introduced as the science subjects to be offered at the Middle Basic and Upper Basic levels.

Federal Ministry of Education (2000) stated the specific objectives of the UBE programme to include ensuring the acquisition of the appropriate levels of literacy, numeracy, manipulative,

communicative and life skills as well as the ethical, moral and civic values needed for laying a solid foundation for lifelong learning. The National Policy on Education (FGN, 2013) entrenches the teaching of science at all levels of education. It is Ibole (2000) belief that science rules the universe. It serves and ensures human survival. Jegede (1983) also asserts that, the development in science and technology has so greatly affected the lives of every human being so much that, to be ignorant of the basic knowledge of this development is to live an empty, meaningless, and probably unrealistic life. Valley and Withier (2009) strongly believe that, a solid foundation in basic sciences is essential to free-thinking participation in the world. It is also clear that, this basic scientific preparation is essential to unlocking doors to a wide variety of professional opportunities.

Therefore, Basic Science has been chosen as one of the core subjects offered at the junior secondary school. It is taught in order to expose students to the basic workings of the scientific enterprise and also provides the learners with the necessary foundation upon which to build subsequent science learning in the senior secondary school. Basically, core curriculum is intended to provide all students with an education that will serve them well regardless of their choices after leaving school. It reinforces the teaching of basic skills and introduces an expanded range of new knowledge and skills to the curriculum. Moreso, Rutherford (2000) enunciates four properties that science course content should have: First, it should be significant; second, it should be accurate; third, it should be aligned with desired or declared learning goals and finally, it should be coherent. The science core curriculum places emphasis on understanding and using skills. Hence, the Basic Science curriculum has been designed to build into the present generation, the skills to meet present and future challenges.

Stakeholders' assessment of the objectives of the Science programme becomes inevitable, because team effort increases the chances of success in reaching educational goals. All stakeholders play important roles as part of a team working for the success of educational goals (Study.com, 2022). Therefore this study assesses Stakeholders' rating of the objectives of Basic Science Curriculum by providing answers to the following research questions:
  (1) What are the profiles of the following stakeholders as indicated by the following socio-demographic variables?
      a. Ministry officials: age, gender, qualifications, area of specialization and years of service.
      b. School Principals: age, gender, qualifications, area of specialization and years of service.
      c. Year Tutors/Heads of Department: age, gender, qualifications, area of specialization and years of service.
      d. Classroom teachers: age, gender, qualifications, area of specialization and years of service.
  (2) What is the extent of Stakeholders' rating of the Basic Science programme objectives?
  (3) Is there significant difference in Stakeholders' Observed and Expected ratings of the Basic Science programme objectives?

Research Design

The study adopted survey research design of the ex-post facto type because the independent variables involved were not manipulated. The assessment was conducted by placing value on the programme objective.

Population

The population for the study comprises all ministry officials, Principals of schools, Year tutors/Heads of departments and teachers teaching Basic science at the Upper Basic class from the six states that comprise Southwestern Nigeria.

Sample and Sampling Procedure

A sample of Five Hundred and Fifty-seven (557) respondents was drawn using purposive and stratified sampling techniques. The procedure was by selecting ten local governments from each state comprising Southwestern Nigeria. The ten Local governments were spread among the three senatorial districts in each of the states.

Instrument

The only instrument employed in this study was Science Programme Objectives Rating Scale (SPORS). This is in two sections: Section A is on the profile of the stakeholders in terms of their age, gender, qualifications, area of specialization and years of service. Section B is a 10-item statement of objectives of Science taught at the Junior Secondary School level. This is based on the objectives of Science of the UBE programme. Stakeholders indicated their rating of the objective of science at the Junior Secondary educational level. The ratings are: 5= Excellent, 4= Very Good, 3= Good, 2= Fair, 1= Poor. The reliability coefficient for the SPORS was determined to be 0.72 (i.e., r =0.72) using Cronbach alpha.

Procedure for Data Collection

The researcher employed the services of trained research assistants from the six states that made up Southwestern geopolitical zone of Nigeria. They assisted in the administration and retrieval of the instruments lasting between two weeks.

Data Analysis

The data collected were analyzed by using descriptive statistics of frequency counts, percentage, mean and standard deviation, as well as t-test statistical analysis.

Results

The Profile of the Stakeholders in simple frequency count and percentages are discussed and followed by pie charts graphical illustrations below:

(i) Demographic distributions of the respondents by State showed Ekiti State having the highest number of respondents (100 representing 17.95%); followed by Lagos and Osun States (95 representing 17.06%); Ondo State (93 representing 16.70%); Ogun State (89 representing 15.98%) and Oyo State having the lowest number of respondents (85 representing 15.26%).
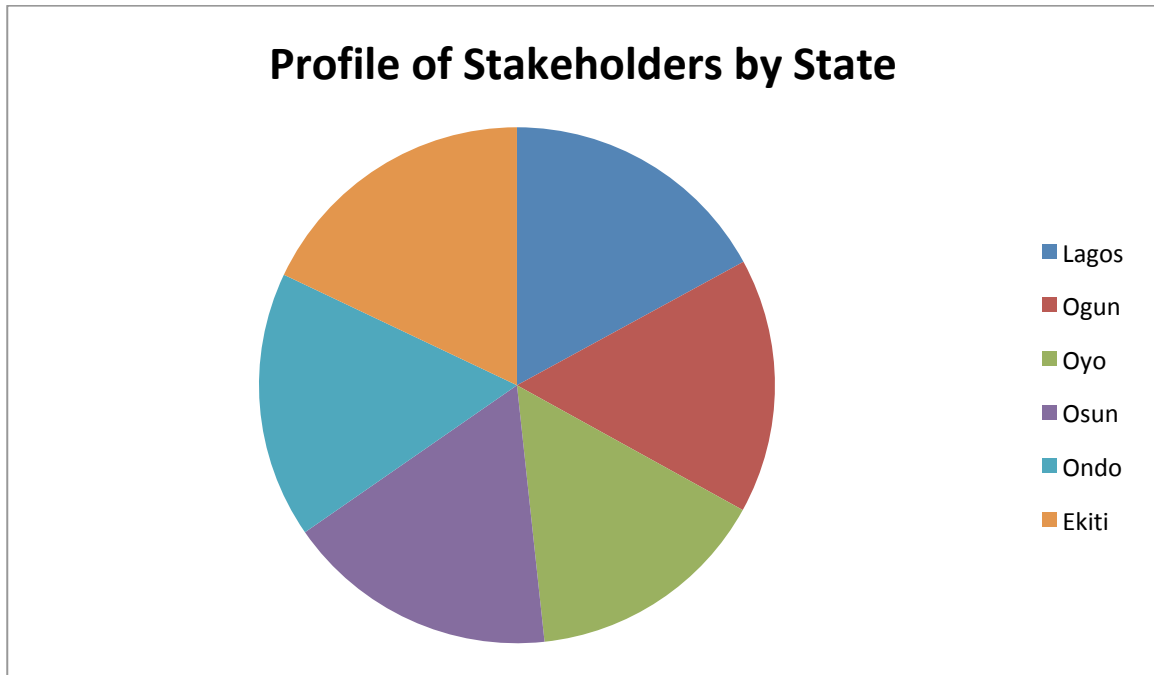
Figure 1: Profile of stakeholders by State

(ii) Demographic distributions of the respondents by Age showed 53 respondents representing 9.51% were in the age bracket 20 – 25years; 265 respondents representing 47.58% were in the age bracket 26 – 40years and 239 respondents representing 42.91% were in the age bracket 41 years and above.
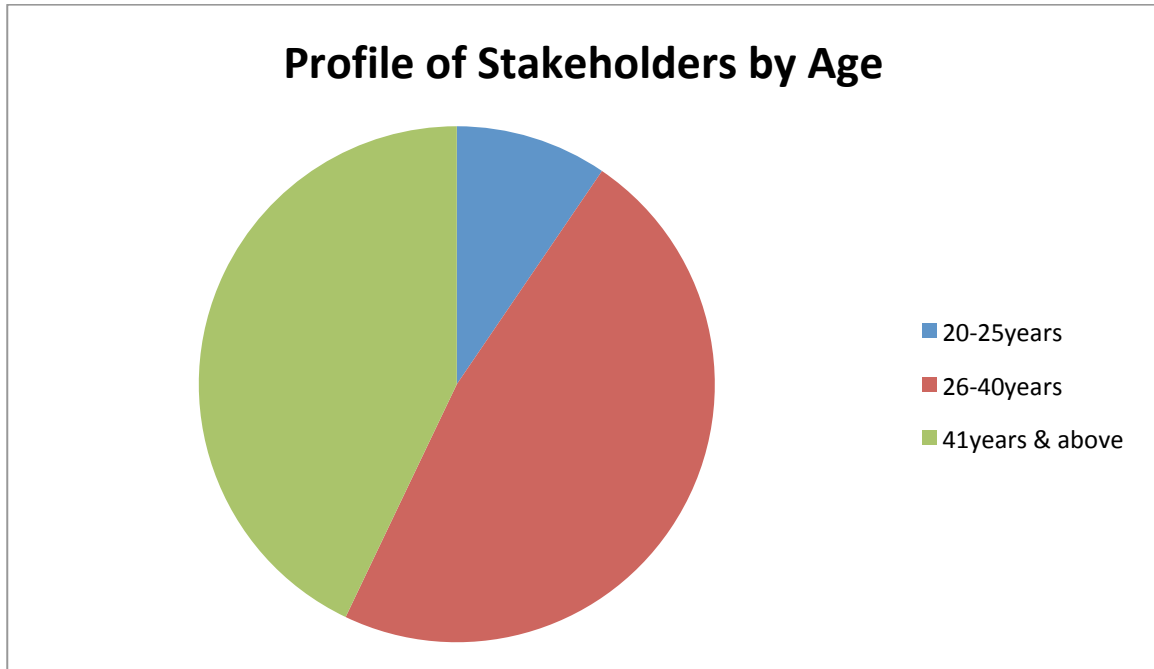

Figure 2: Profile of stakeholders by Age

(iii) Demographic distributions of the respondents by Gender showed that 269 respondents representing 48.29% were Male and 288 respondents representing 51.71% were Female.
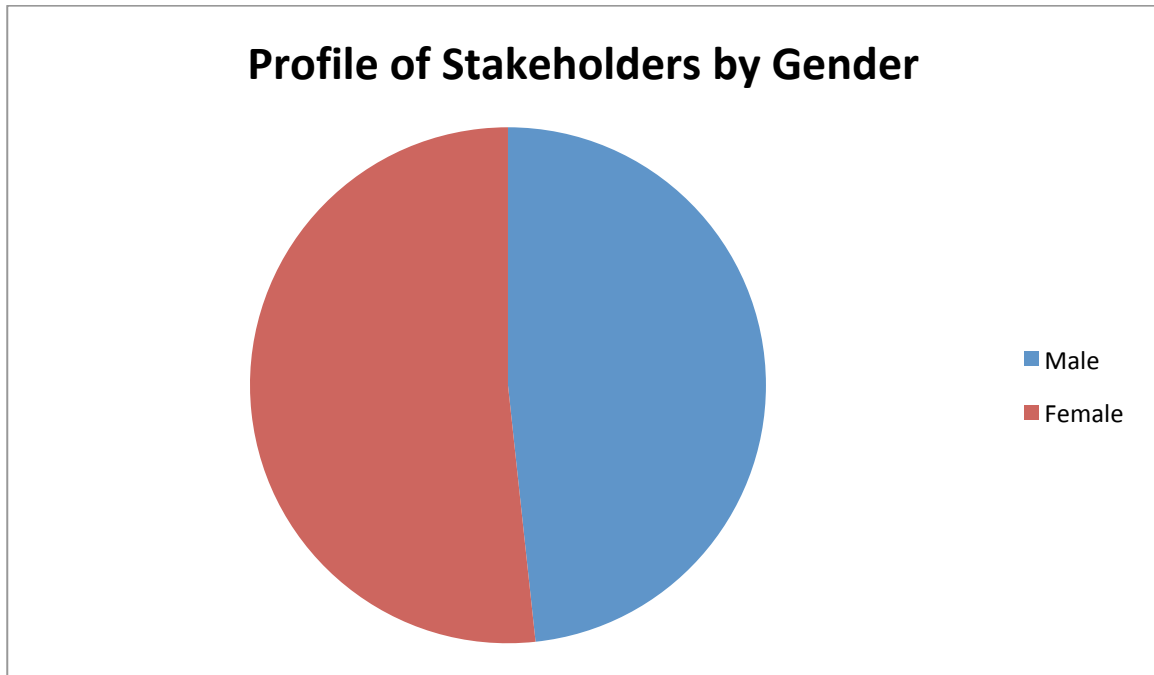
Figure 3: Profile of stakeholders by Gender

(iv) Demographic distributions of the respondents by Qualification showed 18 respondents representing 3.23% were OND/HND holders; 128 respondents representing 22.98% were NCE holders; 312 respondents representing 56.01% were First Degree holders and 99 respondents representing 17.77% were Second Degree holders.
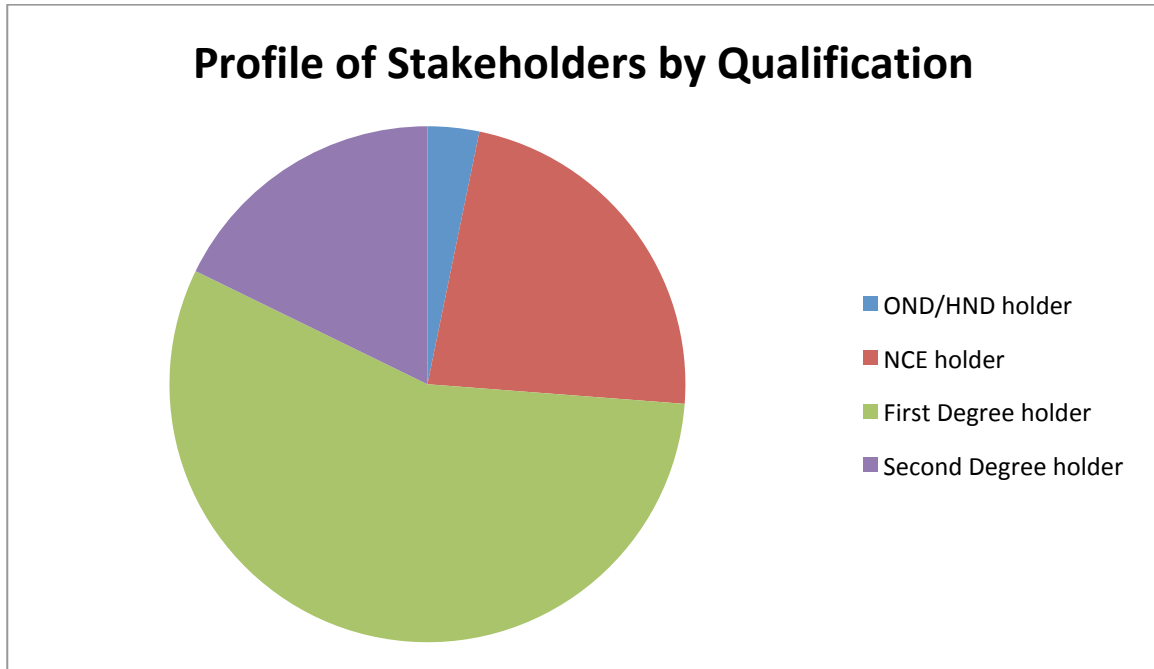

Figure 4: Profile of stakeholders by Qualification

(v) Demographic distributions of the respondents by Area of Specialization showed 278 respondents representing 49.91% specializes in Pure Sciences; 182 respondents representing 32.68% specializes in Applied Sciences and 97 respondents representing 17.41% specialize in Humanities.
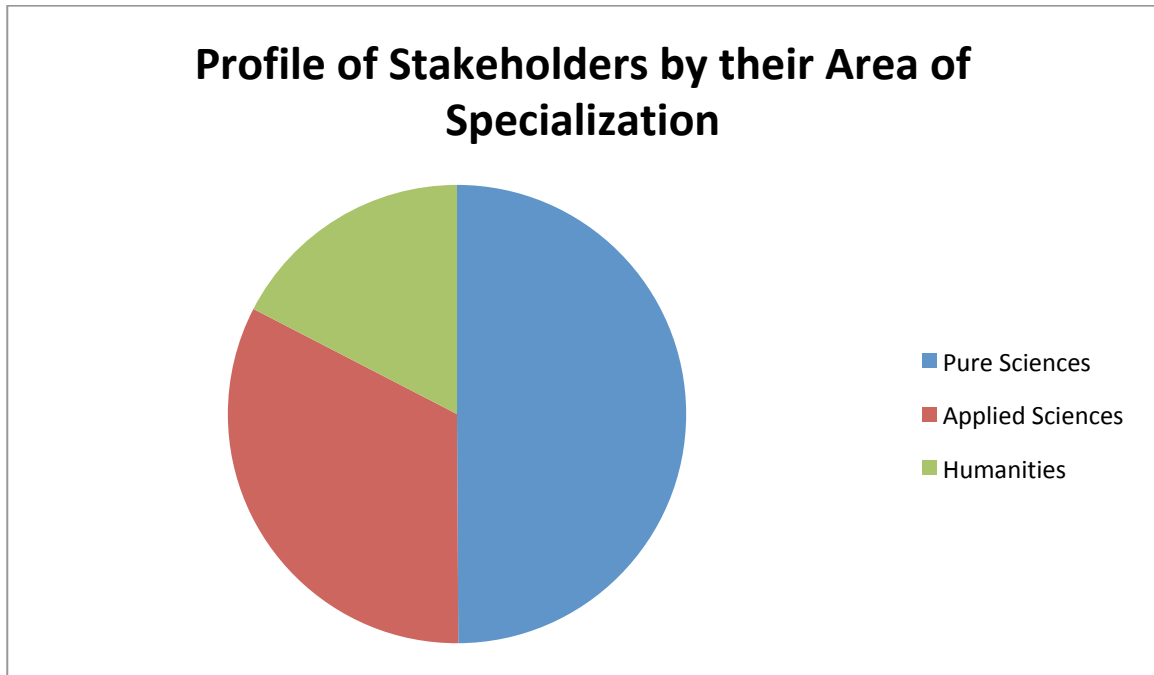
Figure 5: Profile of stakeholders by Area of Specialization

(vi) Demographic distributions of the respondents by their Years of Service showed 111 respondents representing 19.93% have put 0 – 5years in service; 115 respondents representing 20.65% have put 6 – 10years in service; 159 respondents representing 28.54% have put 11 – 20years in service and 172 respondents representing 30.88% have put 21years and above in service.
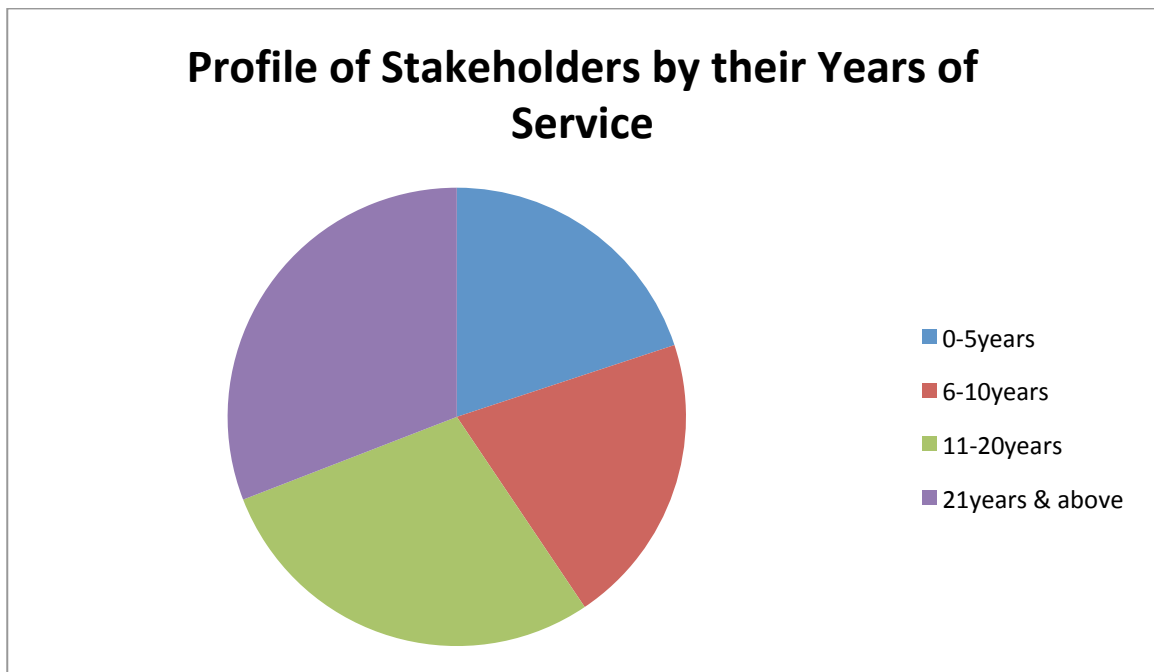

Figure 6: Profile of stakeholders by Year of Service

Research Question Two: What is the extent of Stakeholders' rating of the Basic Science programme objectives?

Table 1 below reveals the mean ratings and standard deviation of the ten statements of objectives of Basic Science by the implementers of the programme. Developing interest in Science and Technology is rated to be very good ($\bar{x}$ = 4.15). Acquiring Basic knowledge in Science and Technology is rated to be very good ($\bar{x}$ = 3.91). Acquiring Basic skills in Science and Technology is rated to be very good ($\bar{x}$ = 3.82). Applying Scientific and Technological knowledge to meet societal needs is rated to be very good ($\bar{x}$ = 3.69). Applying Scientific and Technological skills to meet societal needs is rated to be very good ($\bar{x}$ = 3.68). Taking advantage of numerous career opportunities offered by Science and Technology is rated to be very good ($\bar{x}$ = 3.71). Endowing individual with tools for learning, problem solving, analytical thinking and rational decision is rated to be very good ($\bar{x}$ = 3.54). Becoming prepared for further studies in Science and Technology is rated to be very good ($\bar{x}$ = 3.71). Recognising stages of development is rated to be very good ($\bar{x}$ = 3.61). Also, applying Basic intelligent skills is rated to be very good ($\bar{x}$ = 3.76). In all, the respondents rated the objective of Basic Science to be very good (Weighted average = 3.76), which represents the Observed Stakeholders' rating of the Basic Science programme objectives.

Furthermore, the Expected ratings of the Basic Science programme objectives revealed that for the ten items statements, 138 respondents (representing 24.78%) rated the objectives to be Excellent; 211 respondents (representing 37.88%) rated the objectives to be Very Good: 154 respondents (representing 27.65%) rated the objectives to be Good; 43 respondents (representing 7.72%) rated the objectives to be Fair and 11 respondents (representing 1.97%) rated the objectives to be Poor. In all, the objective of Basic Science was expected to be very good (Weighted average = 3.78), which represents the Expected Stakeholders' rating of the Basic Science programme objectives.

Table 1: Frequency Counts, Percentages, Mean and Standard deviation of extent of Stakeholders' Rating of the Objectives of Basic Science

ITEM	STATEMENT OF OBJECTIVES	EXCELLENT (5)	VERY GOOD (4)	GOOD (3)	FAIR (2)	POOR (1)	MEAN (X)	SD
1	Acquire basic knowledge in science and technology.	149 (26.75)	243 (43.63)	134 (24.06)	28 (5.03)	03 (0.54)	3.91	0.87
2	Acquire basic skills in science and technology.	128 (22.98)	243 (43.63)	150 (26.93)	31 (5.57)	05 (0.90)	3.82	0.88
3	Apply scientific and technological knowledge to meet societal needs.	125 (22.44)	200 (35.91)	178 (31.96)	44 (7.90)	10 (1.80)	3.69	0.97
4	Apply scientific and technological skills to meet societal needs.	125 (22.44)	205 (36.80)	164 (29.44)	48 (8.62)	15 (2.69)	3.68	1.00
5	Apply basic intelligent skills.	140 (25.13)	216 (38.78)	146 (26.21)	40 (7.18)	15 (2.69)	3.76	1.00
6	Endow individuals with tools for learning, problem solving, analytical thinking and rational decision.	111 (19.93)	187 (35.57)	166 (29.80)	75 (13.47)	18 (3.23)	3.54	1.05
7	Take advantage of numerous career opportunities offered by science and technology	130 (23.34)	203 (36.45)	165 (29.62)	49 (8.80)	10 (1.80)	3.71	0.98
8	Recognize stages of development.	92 (16.52)	227 (40.75)	178 (31.96)	46 (8.26)	14 (2.51)	3.61	0.94

9	Develop interest in science and technology	240 (43.09)	190 (34.11)	99 (17.77)	26 (4.67)	02 (0.36)	4.15	0.90
10	Become prepared for further studies in science and technology.	139 (24.96)	195 (35.01)	162 (29.08)	46 (8.26)	15 (2.69)	3.71	1.01
	Weighted average	**3.76**						

*Figures in parentheses are in percentages

Research Question Three: Is there significant difference in Stakeholders' Observed and Expected ratings of the Basic Science programme objectives?

Table 2: Summary of Paired T-test of Observed and Expected ratings of the Basic Science programme objectives

	Basic Science Objectives	N	Mean	Standard Deviation	T	Df	Sig.	Remark
Ratings	Observed	10	3.7580	0.1717	-.405	9	.695	Not significant
	Expected	10	3.7800	0.0000				

Table 2 revealed that there is no significant difference in Stakeholders' Observed and Expected ratings of the Basic Science programme objectives (t = -.405; df = 9; p > 0.05). The mean values show that Observed rating mean score (3.7580) is not significantly different from the Expected rating mean score (3.7800).

Discussion

Stakeholders in education include both those who are directly involved (such as parents, teachers, and students) and those indirectly impacted (such as government officials and local business leaders) by the success or failure of an educational system. All members of a community are stakeholders in education. Local education districts officials, Principals, Year Tutor/HOD and Classroom teachers were handsomely engaged in this study and have rated the objectives of the Basic Science to be very good.

Ivowi & Odunsi (1982) agreed that evaluation studies should focus on three important groups involved in the implementation of school curriculum. These are: teachers, who are the final executors of the programme; learners, whose mental and physical behaviours the programme intends to change; and the society, including policy maker, school administrators and parents, whose support is essential for the achievement of the programme objectives. According to Study.com (2022) team effort increases the chances of success in reaching educational goals, hence, this signals appropriateness of the objectives of the Basic Science curriculum.

Conclusion

This study focused on Ministry officials, Principals, Year Tutor/H.O.D. and Teachers rating of the Basic Science objectives. These personnels could be adjudged to have in depth knowledge and better understanding of the programme. The finding of the study shows that all stakeholders agreed that the objectives are ideal and relevant. With this rating, it can be said that government and policy makers have done their part as it relates to setting standard objective for the Basic Science curriculum of the UBE programme.

Recommendations

The following recommendations are made:

1. Government and relevant stakeholders should provide necessary infrastructures, laboratories and facilities that will motivate teaching and learning of science.
2. Government and relevant stakeholders should motivate science teachers and reward hardworking students with adequate incentives.
3. Government agencies and stakeholders should provide monitoring and evaluation in teachers impacting and students learning system to achieve the desired outcome.
4. Science teachers training and development should be continuous to keep teachers abreast of the global trend.
5. Implementers of the Universal Basic Education programme to ensure that opportunities to engage in science, both in and out of school are varied and stimulating.

Acknowledgement

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