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Balancing Intrinsic and Extrinsic Motivation in Basic Science Education in Osun State

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Abstract
Due to the alarming rate of poor performances in science courses in the senior secondary classes which has been blamed on the negative attitude of the teaching and learning of Basic Science at the lower basic level. Teachers have explored popular motivational technique reinforcement to motivate their students for better results but the aspect of balancing the intrinsic and extrinsic motivation of pupils in learning Basic Science at foundational stage of lower basic school level is yet to be explored especially in Osun State, the study is therefore conducted to bridge this gap. The study determined whether teachers motivate lower basic school pupils (Children between ages 6-8 in primary 1 to 3 classes) to study Basic Science in Osun State. It also investigated whether the pupils were intrinsically motivated to study Basic Science and also determined how teachers sustain the intrinsic and extrinsic motivation of lower basic school pupils in learning Basic Science in the study area. These were in the view to solving the alarming rate of poor performances in science courses and boost pupils' classroom experiences while learning. Survey research design was employed, the sampled population for the study was 20 Basic Science teachers in Osun State. A structured research questionnaire was developed and used as instrument for data collection. Data collected were analyzed using frequency, percentage and mean counts. The study revealed that teachers' motivation for their pupils to learn Basic Science in the study area is relatively low and that students in lower basic school in the study area were not intrinsically motivated to study Basic Science and that could be responsible for low academic performance and low enrollment in science subjects. However, basic teachers are making various efforts to sustain the little motivation in the students through coercion, counseling and sometimes gifts.
Keywords: Intrinsic Motivation, Extrinsic Motivation, Basic Science Education, Lower Basic School, Pupils/Learners/Students
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Introduction

The impact of science and technology in the society cannot be overemphasized. It has helped through modern invention and discoveries to improve man's progress in health, happiness and productivity (Anaeto *et al*, 2016; GoogleAI, 2025). The relevance of science to national goals, aspirations and economy, dictates to large extent, the huge commitment and support which the nation make and give to science and technological development (Omiko, 2017). In this contemporary age of scientific and technological advancement, the need to keep pace with the global trend of development demands that people should be scientifically literate. Without scientific literacy among a sizable proportion of the society, progress in achieving modernization will be difficult (Awodun & Oyeniyi, 2018). It is in line with the above that science Education also known as Basic science in lower basic school is made to be a compulsory subject so as to increase the child's survival, adjustment and adaptation to the immediate and wider environments dominated by scientific activities (Christogonus et al., 2014). At lower basic school level, basic science was introduced for the purpose of giving foundational skills and knowledge for subsequent science studies at the higher level (Awodun & Oyeniyi, 2018). The acquisition of appropriate skills and the development of mental, physical and social abilities and competencies for the individual to live in and contribute to the development of the society has been a major concern of Basic Science. The subject views nature in a holistic approach and this makes it a discipline in its own right.

The aims of Basic Science is directed at enabling learners who are exposed to it acquire skills such as, careful and thorough observations, complete and accurate report of observations, organization of information acquired, generalizing on the basis of the acquired information, predicting as a result of the generalization, designing experiments (including control where necessary) to check predictions, using models to explain phenomena where appropriate; and continuing the process of inquiring when new data do not confirm to prediction. (Federal Government of Nigeria, (FRN); Omiko 2016).

To achieve these objectives, it is suggested that the teaching and learning of Basic science should involve the use of motivation and innovative methods of teaching. Motivation involves the process by which an activity is started and kept with an immediate objective in mind, as well as a situation or the construction of a situation that contains all the elements that affect how well-prepared an activity is". Behaviors of "what" and "why," as well as their "how," are all influenced by motivation "motion, energy, and direction (Deci & Ryan, 2020). Motivation

comes in the form of intrinsic and extrinsic energies that drive humans to act with an inner drive to do something that causes them to persevere (Badubi, 2017). Intrinsic motivation is an individual's activity that stems from the person's desire, wish, personal interest, and performance, while extrinsic motivation enables a person to work in exchange for rewards or avoid punishment. (Begum et al., 2017).

In the teaching learning of basic science, teachers are expected to use the most popular motivational technique reinforcement to motivate their students for better results. These techniques may enhance students' talent of problem solving and chances of success in future life. Many research studies have proved that the motivational techniques can increase a person's performance when the heads of institutions make it mandatory for the teachers to fulfill their responsibilities in a sufficient way, thus improvement becomes inevitable because the teachers automatically take serious measures to motivate their students (Adeleke, 2014). However, Omebe and Omiko (2015) observed that these suggested methods of teaching Basic science have been utilized for several years by the basic science teachers and yet the results of the students in the Junior Secondary School Certificate Examination (JSSCE) have not been encouraging. This calls for reappraisal of the application of the teachers' motivation of their students.

It is surprising that despite the efforts of the government to improve the standard of science education by providing the required human and material resources for the implementation of Basic Science Education at lower basic school levels, learners' performance in basic science in internal and external examination is still very poor in recent years. This is particularly true of the Osun State public education system because it ranks 36th out of 37 states in Nigeria, according to the 2021 statistical report of the Nigerian Bureau of Statistics. The report revealed that more than half (51.5%) of the State's population of senior secondary three (SS3) students could not pass the 2021 WAEC examination with 5 credits minimum including Mathematics and English (Nigerianstate.gov.ng, 2022). This in-turn has led to the decline in the number of students studying science courses at higher levels.

This status may be attributed to lack of trained teachers, lack of proper teaching materials, absence of conducive teaching and learning environment, inadequate evaluation of basic science programs or probably inadequate teaching methods as stated by various researchers but the aspect of sustaining the intrinsic and extrinsic motivation of pupils in learning Basic Science at foundational stage of lower basic school level is yet to be explored especially in Osun State, the study is therefore conducted to bridge this gap.

Motivation has been seen in various studies as one of the most significant variables in explaining learners' performance or non- performance in any educational activity (Bernardo, *et al*, 2025). The intrinsic component is from within the learner and is controlled by personal interest, enjoyment, or fulfillment (Maike, 2021). The extrinsic component however is from the environment of the learners and controlled by the behaviour of others (Ryan & Deci, 2000)

Based on Expectancy-Value Motivation Theory and The ARCS model. Expectancy-Value Theory postulated that there are two main components of motivation and that the interplay of these components plays a very important role in the development of human motivation. These two components are the expectancies for success and the task value. Expectancies for success made reference to the individual's anticipation that performance of a task will be followed by either success or failure while task value was seen as the relative attractiveness of succeeding or failing on a task (Wigfield & Eccles, 2000), in other words, the motivation of learners to study basic science is a product of a leaners' expectation for success in the subject (intrinsic motivation), so if this is absent the tendency for the student to learn basic science may be reduced or completely absent.

The ARCS model believes that human motivation is linked to behavior and emotion of others (Gopalan et al., 2017), The ARCS Model got its name after its four main components: 'Attention, Relevance, Confidence, and Satisfaction'. These components are intended to boost andmaintain the learner's motivation. Keller presented the ARCS model's rough proportions in 1979; which focused on the motivational components of learning rather than delivering the learning information (Dinçer & Serkan 2020). In other words, as important as learning information is, teacher should also pay attention to the motivational components of learning in other to keep the learners' interest in the study. The ARCS model is incorporated into the Self-Determination Theory (SDT) since learners can be motivated directly using attractive, satisfying, appealing, exciting and stimulating learning materials provided by their teachers (Gopalan et al. 2017).

The Expectancy-Value Motivation Theory and The ARCS model are also similar to SDT in that both established that learner's evaluation of their environment (extrinsic motivation) can either facilitate or hinder intrinsic motivation by supporting or frustrating Basic Psychological Needs (BPN) (Bernardo, *et al*, 2025). According to Bernado *et al*, (2025), SDT highlighted that support for interpersonal behaviours such as autonomy, competence and relationship is closely associated with BPN satisfaction, whereas frustration of autonomy, competence, and relationship is associated with BPN frustration. Emphasizing the universality of, BPN to all human beings, regardless of class, age, race, gender and cultural background, and it direct linkage to the regulation of motivation. The inference from the is that for learners to have any academic success in any subject, the intrinsic and extrinsic motivation has to work hand-in-hand. While one lies within the control of the learners, the other is initiated by the teacher but both can largely be sustained by the teacher emphasizing the crucial role of the teacher

in the classroom activities.

The objectives of this study are therefore to;

i. determine whether basic science teachers motivate pupils to learn basic science in Osun State;
ii. investigate whether the pupils are intrinsically motivated to learn basic science in the study area;
iii. determine how teachers sustain the intrinsic and extrinsic motivation of pupils in learning basic science in the study area.

METHODOLOGY

This study adopted a descriptive survey research design. The population of this study consisted of all basic science teachers in lower basic schools in Osun State. A sample of twenty (20) Basic Science Teachers from public schools were selected. Multi-stage sampling procedure was used to select the sample. Out of the three (3) senatorial districts in Osun State, one (1) senatorial district was randomly selected (Osun East Senatorial District). In the selected Senatorial District, two (2) LGAs (Ife Central and Ife East) were randomly selected for the study. In the selected LGAs, five (5) public lower basic schools were randomly selected from each of the two (2) LGAs making ten (10) lower basic schools, in the selected schools, two (2) Basic science teachers were purposively selected for the study, making a total of Twenty (20) teachers selected as the respondents for the study. A self-designed and structured questionnaire titled "Questionnaire on Sustaining Intrinsic and Extrinsic Motivation" (QSIEM) was used to collect data for the study.

Results and Discussions

Table 1: How Teachers motivate pupils to learn Basic Science

S/N	Items	OFTEN (%)	SOM (%)	NEVER (%)
1	Pupils are allowed to independently conduct experiment to motivate them in studying Basic Science	4 (20)	4 (20)	12 (60)
2	Pupils are taken on excursion to motivate them in studying Basic Science.	0 (0)	6 (30)	14 (70)
3	Pupils are given instructional materials in order to motivate them to learn in Basic Science class	6 (30)	4 (20)	10 (50)
4	Pupils are actively engaged in practical to motivate them to learn Basic Science	(0)	0 (0)	20 (100)
5	Teacher provides timely and constructive feedback to pupils to motivate them to study Basic Science	8 (40)	12 (60)	0 (0)
6	Pupils engage in group projects activities to motivate them to study Basic Science	4 (20)	4 (20)	12 (60)
7	Teacher gives rewards and gifts to motivate pupils to learn Basic Science	14 (70)	6 (30)	0 (0)
8	Teacher engages in counseling to motivate student to learn Basic Science	16 (80)	4 (20)	0 (0)
9	Teacher exposes the students to the future prospects of Basic Science to motivate them to learn	3 (15)	14 (70)	3 (15)
10	Teacher simplifies instructions in the classroom to motivate the pupils to learn	16 (80)	4 (20)	0 (0)

Source: Field survey, 2024

The result from table 1 above shows teachers' motivation for the pupils to learn Basic Science in the study area is relatively low (pupils are not allowed to independently conduct experiments (60%), they are not taken on excursion (70%), nor actively engaged in practical to motivate them to learn Basic Science (100%). This result contradicts the suggestion of Adedeji (2007) that the teachers of science and mathematics should try as much as they could to motivate their students during the course of instructions. It also not in line with Badubi, (2017); Begum *et al*., (2017) and Dinçer & Serkan (2020) that recommended that teachers should pay attention to motivating the learners rather than concentrating on giving instructions alone because motivation will ensure that learners persevere in studying.

Table 2: Pupils Intrinsic Motivation to learning Basic Sciences

S/N	Items	OFTEN (%)	SOM (%)	NEVER (%)
1	Pupils attend Basic Science class without being flogged	6 (30)	10 (50)	2 (20)
2	Pupils are happy to do practical in Basic Science Class.	4 (20)	4 (20)	12 (60)
3	Pupils are eager to register for Basic Science lessons in the school	4 (20)	6 (30)	10 (50)
4	Teachers do not need to give gifts to pupils before they attend Basic Science classes	6 (30)	6 (30)	8 (40)
5	Pupils have learning materials and textbooks for Basic Science.	8 (40)	4 (20)	8 (40)
6	Pupils participate actively in classroom discussions during Basic Science lessons	4 (20)	10 (50)	6 (30)
7	Teachers do not need to report the pupils before they attend Basic Science Classes	6 (30)	6 (30)	8 (40)
8	Pupils always submit their Basic Science assignments on or before the due time for submission	6 (30)	4 (20)	10 (50)
9	Pupils are eager to participate in Basic Science group projects and competitions	4 (20)	4 (20)	12 (60)
10	Pupils want to study science courses in the future due to their love for Basic Science	6 (30)	8 (40)	6 (30)

Source: Field survey, 2024

Table 2 shows that the intrinsic motivation of the pupils to study Basic Science in the study area is low because they have to be flogged before they attend Basic Science Class (80%), they are not eager to register for Basic Science lessons in the School(80%), they do not submit their Basic Science assignments on or before the due time for submission(70%), they are not eager to participate in Basic group projects and competition(80%), pupils are not always happy to do practical in Basic Science Class though they have limited or no opportunity to (80%), and most of them do not have learning materials and textbooks for Basic Science(60%).

This result implies that the pupils fail basic science examination because they are not intrinsically motivated. It also shows that the pupils have no expectancy-value. This relates with the findings of Tokan & Imakulata (2019), that intrinsic learning motivation is the driving force that emerges from within the students in form of desire, aspiration, and capacity for achievement and if not present, the academic success of such students may be at risk. The result also corroborates Abah, Okoh and Ogugua (2022), that intrinsic motivation improves academic performance of the students and without it, the academic performance of the students may not improve.

Table 3: How teachers sustain the intrinsic and extrinsic motivation of pupils

S/N	QUESTIONS	SA (%)	A (%)	D (%)	SD (%)	Mean
1	Teachers have to regularly give gifts so that the pupils can attend Basic Science class	16 (70)	4 (30)	0 (0)	0 (0)	3.32
2	Pupils are usually persuaded to conduct independent experiments so as to continue learning Basic science.	2 (10)	6 (30)	12 (60)	0 (0)	1.64
3	Teacher has to coerce pupils to participate in group projects to motivate learning Basic Science	2 (10)	6 (30)	8 (40)	4 (20)	1.66
4	Teacher continually speaks about the future benefits of learning Basic Science (e.g., scholarships, job opportunities) to motivate pupils learning.	18 (90)	2 (10)	0 (0)	0 (0)	3.84
5	Pupils have to be taken on excursions to motivate them to learn Basic Science	4 (30)	2 (10)	10 (50)	2 (10)	1.62
6	Teacher has to push pupils to participate in Basic Science competition regularly to motivate them	8 (40)	4 (20)	5 (25)	3 (15)	2.38
7	Teacher often uses force to ensure that pupils attend classes	8 (40)	4(20	5(25	3 (15)	2.38
8	Teacher consistently uses teaching aids and instructional materials to encourage the pupils to learn Basic Science	4 (30)	2 (10)	10 (50)	2 (10)	1.62
9	Teacher reports pupils so as to attend Basic Science classes	8 (40)	12 (60)	0 (0)	0 (0)	3.52
10	Pupils are consistently recognized and praised when they show efforts and progress in learning Basic Science.	20 (100)	0 (0)	0 (0)	0 (0)	4.0
	Aggregate					**2.60**

Source: Field survey, 2024

Tables 3 shows the efforts of teachers in sustaining the intrinsic and extrinsic motivation of pupils in learning

Basic science in the study area, Teachers give regular gifts (100%), continually speak about the future benefits of learning Basic Science (90%), report pupils to the principal so as to attend Basic Science classes (100%), use force to ensure that pupils attend classes (60%), consistently recognized and praised pupils when they show efforts and progress in learning Basic Science (100%) and they also push the pupils to participate in Basic Science competition(60%) to motivate them to learn in Basic Science classes. This revealed that teachers make efforts in sustaining the intrinsic and extrinsic motivation in their students because teachers believe that by sustaining the little motivation in the students, their academic performance might improve, (Adeleke., 2014), this is in line with Siyuan et al., 2020 who concluded that extrinsically motivated people will work on a task even if they are uninterested in it because they anticipate receiving satisfaction from a reward.

In reference to the result in table 1, which shows that teachers' motivation to study basic science in the study are is low, the result in table 3 shows that teachers are making effort to at least sustain the little motivation that the learners have.

Conclusion and recommendations

The study concluded that motivation of pupils by the teachers to learn Basic Science in the study area is relatively low. Pupils in the study area are not intrinsically motivated to study basic science and that could be responsible for low academic performance and low enrollment in science subjects. However, Basic Science teachers are making various efforts to sustain the little motivation in the learners through coercion, counseling and sometimes gifts. This study therefore recommends that, teachers might need to critically study the pupils in order to identify what could be done to improve on the intrinsic motivation of the learners in the study area. Parents also work with the teachers in motivating pupils to boost their intrinsic motivation so as to balance the teachers' effort on extrinsic motivation in order to improve the academic performance and enrollment of students in science-based subjects in higher classes. In the same vein, teachers should provide proper feedback to the learners by the teachers for better performance in basic science. Teachers also need to lay emphasis on the hands-on learning strategies in basic science practical, field excursions and group projects to motivate learners to develop interest in science courses.

Research direction in future can evaluate the effect of balancing intrinsic and extrinsic motivation in various subject classrooms.

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