BIOTECH PROJECT FOR RURAL HIGH SCHOOLS'

DEMYSTYFYING BIOTECHNOLOGY FOR RURAL SECONDARY SCHOOLS

SPONSORED BY Biochemical Society's Diversity in Science Grant

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FINAL PROJECT REPORT:

Project Overview:

The Biochemical society via the "Diversity in Science grant approved the sum of two hundred and forty- one pounds (241) for the project tagged "Biotech for Rural high Schools". The overarching aim of the project was to address the Science, especially knowledge of Biotechnology and Molecular Biology gap between students in secondary schools located in rural areas of Abia State when laboratories are ill-equipped/non-functional and Science. The fact that these students face the same National entrance examinations and West African/ General Certificate examination place them at grossly disadvantaged positions. The project therefore was aimed at introducing Senior secondary school students in two rural schools in Abia state Nigeria to Basic Molecular Biology concepts and practical steps in DNA extraction from Banana using non-sophisticated chemical and affordable equipment which their teachers can continue to use in future classes. The lectures were meant to introduce the students to basic concepts and application of Biotechnology as well as Career talk in Molecular Biosciences. The hands of session involving practical demonstration and hands on for teachers and selected participant was intended to drive home the lessons taught.

Selection criteria for schools:

The schools for the project were chosen based on the following criteria

- Location in an area that is relatively far from the state criteria conferring a disadvantage
- Public schools were selected as most children from little or no tradition of educational attainment in family attend public schools funded by government.
- Schools where the students come from socio-economically under-represented & low family income

Activities

At the time the grant was disbursed schools were on holiday. The schools approached preferred the activities in their second term to align with the scheme of work.

Our team;

I. Prof Ifeoma Irene Ijeh-Professor of Biochemistry & Project coordinator
II. Mr Ben Ogenyi-Molecular Biologist and Researcher at Center for Molecular Biosciences and Biotechnology
III. Mrs Udoka Edward -Otali- Biochemist &Researcher at Center for Molecular Biosciences and Biotechnology
IV. Mr Ifeanyi S. Nwachukwu -ICT
V. Engr. Jeffrey Matthew-Technical Support.

First School Visit.

Project Site: Awom na-Ebo Secondary Technical School, Amawom, Ikwuano Local Government Area

Date: 28th January, 2025

Attendance: More than 67 Students from the Senior Secondary School and Six teachers Participated.

The programme of activities is shown below.

WORKSHOP PROGRAMME:

9-9.30am: Arrival and Registration

9.30am-9.35am: Opening prayer

9.35am—9.40am: Brief Introductions

9.40am -9.45am: Principal's opening remark

9.45-10am: Brief Introduction of Biochemical Society UK & Purpose of Diversity in Science grant

10.00am -10.15am: Introduction to DNA, Biotechnology and it's prospects-Prof I.I.Ijeh

10.15-10.30am -Basic genomics and DNA.-Mr Benjamin Ogenyi

10.30-10.45: Steps in DNA Extraction -Mr Benjamin Ogenyi

10:00am -1.00pm: Hands -on Session, Questions and Answers, refreshments and gifts

Some picture highlights

The introductory lecture Session (Photo showing Prof Ijeh and Mr Benjamin Ogenyi)


Student listening with rapt attention.


Cross section of students at the visit to Awom na-Ebo Secondary Technical School, Amawom

The hands -on session.

Preamble: Our team was informed that since the laboratory building collapsed over 15years ago the students have had no science practical experience.

Our interaction revealed that these students could not identify basic glassware including test tubes.

The visit was thus welcomed with excitement by both students and their teachers. Selected students were chosen to join in the practical steps and asked to demonstrate every step to their colleagues.

Their joy was palpable on seeing the buffy coat of the precipitated DNA following the steps in the manuals we provided.

Group photograph: School Principal, Vice-Principal and some teachers seated with our team flanked by some of the Senior Science students.

Refreshment, Soft drinks, Biscuits and Water served and exercise books distributed to students who participated in the question and answer sessions.

The Principal and Vice Principal expressed their heartfelt appreciation to the Biochemical Society and Diversity in Science in Science Grant for the privilege for the exposure and the opportunity to have a hands-on experience.

Activity 2: Project Site: Ikwuano Secondary School, Ariam, Ikwuano Local Government Area
Date: 14th February, 2025
Attendance: More than 120 Students from the Senior Secondary School and Eight teachers Participated.
Programme of Activities:
The same programme used for Awom na-Ebo Secondary Technical school was adopted. Copies of the protocol was distributed to teachers and selected students.

The School had no functional laboratory just like the earlier school. The dilapidated school hall was used.

After the lectures a hands on session was held, refreshments served to the students. A group photograph was also taken.

The Principal of Ikwuano Secondary School with the Biotech Demo Team after the activity.

Demonstrating the use of hand -held centrifuge for the students and teachers

Demonstrating the steps in DNA Extraction from Bana for students and teachers.

OUTCOMES AND FEEDBACK

The Biotech for high school project successfully met its objectives, with feedback indicating significant improvements in student engagement and understanding.

Feed back from teachers and students showed strong increases in basic knowledge of Molecular basis of life, Genes, DNA and nucleic acid. The applications of DNA knowledge in everyday life, medicine agriculture and related fields. Students expressed strong interest in pursuing STEM fields in the

future. The feedback from teachers and parents highlighted increased enthusiasm for science,

particularly stemming from the hands-on, exploratory approach.

Indeed the project demystified Biotechnology for these rural students and gave them confidence that they can compete favourably in STEM fields despite their relative disadvantaged exposure to Science. The teachers gained confidence that they could carry out some basic practical classes for the students without the need for sophisticated laboratory equipment and electricity which is not available in the in their rural setting.

For my team it was a rich and satisfying experience seeing the impact of this little project on the young ones.

The schools are already asking for another visit, while several rural schools in the locality are requesting for same activity.

Future plans

This project has revealed the huge knowledge gap between urban high schools and rural in terms of Science knowledge and practical demonstration. We plan to reach more schools if funded and add more basic practical demonstrations in Biosciences relevant to the high school scheme of work to ensure that these disadvantaged students compete better with their peers in the city and from higher socioeconomic class.

If we are funded we will add video demos which their teachers can use along with theoretical classes**.**

Once more we say a big thank you to Biochemical Society for approving the grant. And pray for more funds in future to cover more schools.

Professor Ifeoma Irene Ijeh (FNSBMB)