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Second Report: Phase II

This second report highlights the accomplishments since the inception of the project, in particular, achievement of Phase II activities including preparation and development of test modules as approved in the Memorandum of Understanding. The report provides the justification of the payment for Phase II and recommends release of funds to implement Phase III activities (production and delivery of test instruments).

The accomplishments since inception of the project

In the inception report of 12th June 2017, we presented the activities that will be carried out at the onset of this project. One of the main activities being a four-day workshop on test-item writing.

The objective of the test item writing workshop was to **construct** a set of multiple choice achievement and essay test items based on the SS II curricular for English language, Mathematics, Biology, Chemistry and Physics. Also, to identify content areas in the five subjects that both SS II students and their teachers are weak in or experience challenges with. Ensure extensive coverage and completeness of curriculum based test items to enrich the subject banks. Another objective was to train secondary school teachers on test-item writing.

The expected end-products of the workshop are: test blue prints in five (5) core subjects and the draft modules of SS2 first, second and third term test items ready for pre-testing. Each term

"I am ashamed of the items in the curriculum I skipped in previous years. I now understand how my actions have adversely affected the performance of my students. I always blamed them for poor performance, but this workshop has shown it was also because of my negligence."

-----Statement by a teacher, workshop participant

test item will contain about 20 modules depending on the subject. This activity was accomplished and the end product of the workshop are the drafts of test items in English, Mathematics, Biology, Chemistry and Physics.

This report provides evidence of the **accomplishment of the above-mentioned activity** and **new activities planned** for which funding (as per the Memorandum of Understanding) is being requested.

WORKSHOP ON DEVELOPMENT OF STANDARDIZED TEST MODULES FOR SS 2 STUDENTS HELD BETWEEN 21ST TO 24TH JUNE 2017 AT FINOTEL HOTEL-AWKA, ANAMBRA STATE

The workshop was on the development of standardized test modules for five subjects (English language, Mathematics, Biology, Chemistry and Physics) to be used for Monitoring Learning Achievement of SS2 students in all the secondary schools in Anambra State. The venue of the workshop was Finotel Hotel in Awka-Anambra State.

Most of the participants arrived on 20th June and were checked into their rooms already paid for by the organizing team. From arrival to the closing date of the workshop, participants were provide funds for breakfast and dinner. They received transportation allowance. Lunch was served to ensure full participation of all in the morning and afternoon sessions from 21- 24 June inclusive. A total of 43 persons participated in the workshop. This comprised 5 panel leaders, 5 education specialist, 5 subject specialist, 18 subject teachers, 7 technical and administration support staff (PhD and MSc students from Nnamdi Azikiwe University) and 3 coordinators.

Training Workshop – Wednesday, 21/6/2017

The workshop began with the registration of participants (**see Appendix 1**, opening prayer by Mrs Maureen Onwuemenam, introduction of participants and the coordinating team and presentation of the overview, objectives and expected outcomes of the workshop by Professor Uche Amazigo

On the arrival of the Honourable Commissioner of Education, Professor Kate Omenugha, a welcome address was presented by the Permanent Secretary, Ministry of Education represented by the Director of Schools, Mrs Ada Okonkwo. She welcomed participants and solicited for their maximum cooperation to accomplish the objectives of the project.

Lady Joy Ulasi, Chairman of PPSSC in her remarks encouraged the teachers and called on them to produce a worthwhile product. The Public Relations Officer of the MoE introduced the Commissioner of Education.

The Honourable Commissioner, Prof Azuka Omenugha addressed the participants in Igbo language in keeping with the rule of the state to speak Igbo on Wednesdays. She explained the relevance of regular assessment of the learning achievements of secondary school students. She appealed to the teachers not to disappoint the state as they were chosen based on performance and their track records. She formally declared the workshop open.



Figure 1. Honourable Commissioner of Education and some participants.

TECHNICAL SESSIONS

Planning an Achievement Test by Prof B.G. Nworgu

The technical sessions began with the training of subject teachers of English language, Biology, Chemistry, Physics and Mathematics as well as Subject and Education specialists. First, Prof Nworgu explained the structure of the five groups, with each subject group consisting of a Panel leader, three subject teachers and a content/education specialist. He explained that each school work shall consist of a module. A module will contain about 20 items with 9 weeks, making a total of 180 items for a school session i.e. 540 items.

A working paper to help participants understand the basis of achievement testing was presented by Prof. B.G. Nworgu. He explained the meaning of achievement test, its functions, how to plan and develop good achievement test items. He drew attention to the next working paper on test blue print which will serve as a table of specification. Prof. Nworgu compared the TMAT with SAT, highlighting the advantages of SAT over TMAT. This session lasted for 30 minutes after which there was 15-minutes interactive session on achievement testing.

Developing the test blue print

The second working paper on development of test blue print and table of specification was presented by Dr. J.J Agah. He explained the new domain or modified Bloom's Taxonomy – Remembering, Understanding, Applying, Analyzing, Evaluating and Creating (**Appendix 2**). According to Dr. Agah, a test blueprint enables a test developer to ensure content validity of an achievement test. The participants were trained on how to develop test blue print and on the use of the table of specification. Dr Agah stressed on the importance of teachers ensuring that the content of curriculum is covered. This session lasted for over 30 minutes after which there was an interactive section.

Breakout sessions

Breakout sessions were organized to enable participants and panel leads address specific issues and topics. In this break out session, guided by the Panel leaders, the teams constructed **test blueprints** for English language, Biology, Chemistry, Physics and Mathematics, and for first, second and third terms of SS2 work based on the SS2 curriculum and scheme of work. At the end of the session, the five teams **developed test blueprints** for writing the draft test items.

Second Day of the Training workshop – Thursday, 22/6/2017

Writing test items that measure cognitive levels

On 22nd June, following a review of previous day's work, Prof. U.M Nzewi introduced the writing of test items. She elaborated on the new domain; provided a guide for identifying the cognitive levels and explained action verbs to be used when setting test items that measure different cognitive levels. Documents with information relevant to this and other sessions were photocopied and distributed to the participants (**Appendix 3, 4**). An interactive section of over 20 minutes followed this session.

Construction of multiple choice test items

The working paper on general guidelines for writing good and multiple test items was delivered by Prof. D.N Ezeh. Participants were taught how to develop good items, beginning with writing good stem, response options, the key and the distracters to construction of multiple choice items. As the interactive and breakout sessions, participants were able to present some test items.

At the closure of each day, at about 8pm, the coordinators and Panel leads held debriefing meetings to evaluate teachers' performance and to determine areas for improvement.

Third Day of the Training Workshop – Friday, 23/6/2017

Writing test items and visit of a monitor from the Ministry of Education

The third day's work began with a review of day two and update of the group's item writing. After the reports of the five subject panels, the break out session for item writing continued. During this session, **Mrs Vivian Anyadubalu**, representing the Permanent Secretary and the monitors joined the workshop for a few hours. She interacted with the teachers, monitored progress including the completion of the first draft test items by the physics team. Her observation is reproduced in **Appendix 5**. Review and editing of test items started for some of the subject panels that had finished their test item writing.

Fourth Day of the Training Workshop – Saturday, 24/6/2017

To accomplish the objectives of the training workshop and development of test items, all participants had to work on Saturday 24th June and a good of them worked also on Sunday, 25th June 2017.

On the fourth day, reviewing and editing of test items continued till lunch break. After break, there was panel work on serialization, filing and compilation of test modules. This exercise lasted till Sunday, 25/6/2017. A

total of 27 modules were developed for English language, 23 for Biology, 31 for Chemistry, 30 for Physics and 24 for Mathematics. The developed draft modules were based on the number of topics in each subject. On Sunday, 25/6/2017 the final output was submitted by each of the panel leaders to the coordinators of the project.

PHASE II ACCOMPLISHMENTS – PART A

- Recruitment of item writers: Panel leaders, Education and Subject specialists and SS2 subject teachers
- Planning and preparation of training workshop – technical and administrative activities
- Training of test item writers
- Test Item Writing – the training workshop for test item writing 21-24 June
- Editing /Review of test items
- Serialization and compilation of items into draft testlets based on Modules

Summary of products of PART A

27 draft modules for English language.

23 draft modules for Biology,

31 draft modules for Chemistry,

30 draft modules for Physics and

24 draft modules for Mathematics.

By involving the teachers of SS2 students, we are pleased to note that these modules are the products of an all-inclusive effort. We hope the final products will acknowledge the unique contribution of teachers.

Improved knowledge of school subject teachers who for the first time participated in developing and construction of test items. By this exercise, teachers identified their own weaknesses in the subjects they teach, gaps in content, the inherent vulnerabilities of students because teachers skip teaching those subject items they do not understand rather than finding ways or other teachers to cover those items.

In the words of a teacher participant *“I am ashamed of the items in the curriculum I skipped in previous years. I now understand how my actions have adversely affected the performance of my students. I always blamed them for poor performance, but this workshop has shown it was also because of my negligence.”*

PHASE II ACCOMPLISHMENTS – PART B.

The following activities overlap in Phases II and III of the MoU. These have been accomplished.

CONTENT DIFFICULTY PERCEPTION SCALE

Content difficulty perception scales has been developed for the five subjects (English, Mathematics, Biology, Chemistry and Physics).

(i) Test modules and Content difficulty perception scales validation

The developed test modules and content difficulty perception scales have been subjected to face **validity** by 10 experts (two experts per subject). These judges examined the adequacy of the items of the instruments, undertook a systematic comparison of the test content with subject content and determined whether the instruments will achieve the project objective.

(ii) Modification of test modules

The issues raised by the experts have helped the coordination team to modify the modules in all five subjects. Modification of test modules have been accomplished.

PHASE III ACTIVITIES

1. TRIAL-TESTING OF THE TEST MODULES AND CONTENT DIFFICULTY PERCEPTION SCALES

The activities listed below should be carried out as part of Phase III:

- (a) Production and packaging of draft instruments – SATMs and CDPS for trial testing
- (b) Training of 17-20 Field Assistants to conduct the trial testing of items.
- (c) Mapping out schools for trial testing
- (d) Field Testing of draft instruments (test items) produced during the workshop.

The developed test modules and content difficulty perception scales will be trial-tested on a suitable sample of students presently in SSIII in Anambra State public schools. This will be done during the first week of resumption in September 2017. This sample of SSIII students is appropriate because they have covered all the course content of SSII for all the subjects. Trial testing will be used to determine the psychometric properties of the achievement test items in English, Mathematics, Biology, Chemistry and Physics, select items of sound psychometric qualities and compile same into testlets based on the modules, establish the validity (content and predictive) and reliability (internal consistency) of standardized test modules for all the subjects. The exercise will enable the standardization

the instruments on an adequate sample of SS III students from Anambra State, establish gender, location and school type norms based on the standardization data among others.

2. ITEM ANALYSIS

Item analysis exercise shall include:

- Scoring of instruments - SATMs, CDPS and FGD- after trial testing
- Statistical analysis/Determination of Item Characteristics & Reliability SATMs, CDPS
- Review and selection of suitable test items
- Serialization, development of Filing system and compilation of items into final testlets based on Modules

3. REQUEST TO RELEASE FUNDS FOR III ACTIVITIES OF THE MoU

It is important to also carry out the main study (administration of the standardized test items to 80-100 schools) immediately after the trial testing of modules. We therefore strongly recommend that the activities of Phase III in the Memorandum of Understanding (MoU) be implemented soon. If this recommendation is acceptable to the Ministry of Education, the activities can be accomplished if funds are made available. This will enable:

- (i) Implementation of the **production and delivery of test instruments listed on page 2 of the MoU.**
- (ii) Completion of all field activities including testing students before they forget SSII curriculum items; and testing the teachers who taught them in SSII before numerous changes.
- (iii) To maintain the same target population i.e. students in SSIII class who had just completed the SSII class
- (iv) The **test standardization phase** will include following specific activities:
 - a. Production and packaging of instruments - SATMs, CDPS and FGD
 - b. Training of Field Assistants and teachers who are to administer the final version of the test items/instruments to students
 - c. Delivery/Administration of instruments and FGD in 80 -100 secondary schools; standardization of SATMs, teacher competency & content difficulty perception studies. Assuming there is an average of 100 SSII students in each selected school, and a minimum of 80 schools are included for all 5 subjects. This exercise will require enormous manpower and intense coordination of the administration, reliable scoring and validation of more than 40,000 scripts.
 - d. Scoring of instruments/test items in all five subjects
 - e. Data analysis and development of norms.
 - f. Review of result of data analysis by core project staff. Each stage will involve MoE monitors.