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PROGRESS REPORT
to the
AGENCY FOR INTERNATIONAL DEVELOPMENT
on the
AFRICAN MATHEMATICS PROGRAM
January 1, 1965 to June 30, 1965 .
under
AID Contract RES-21, Amendments 1 & 2

A.I.D.
Reference Center
Room 1688 NS

Educational Services Incorporated

Watertown, Massachusetts 02172

September 30, 1965

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PROGRESS REPORT

The following is a progress report to the Agency for International Development on the African Mathematics Program of Educational Services Incorporated for the period January 1, 1965 to June 30, 1965. Activities during the period under AID Contract RES-21, Amendments 1 and 2 included 1) planning and organizing the 1965 Workshop to continue the preparation of mathematics texts for Tropical Africa 2) organizing courses in Liberia and Eastern Nigeria and a joint course for Malawi and Zambia in Zambia to train teachers of trial classes and/or teacher trainers and ministry officials to use the Entebbe Mathematics Texts, 3) arranging for completion of publication of the manuscripts written at the 1964 Workshop and for the distribution of the Entebbe Mathematics Series to African schools using the material on an experimental basis, 4) planning and securing support for the widespread training and retraining of African mathematics teacher trainers and teachers 5) following-up on the syllabus submitted to the West African Examinations Council and Cambridge Examinations Syndicate.

Planning and Organizing Continuing Preparation of Texts at 1965 Workshop

Planning for the 1965 Mathematics Writing Workshop began immediately after the close of the 1964 Workshop. At Steering Committee meetings October 3 and 31, 1964, tentative lists of U.S. and African invitees were drawn up. However, the issuing of firm invitations was delayed because the existing amendments to the contract provided funds for the program only up to June 30, 1965.

By early February 1965 an outstanding group of U.S. university mathematicians and mathematics educators had agreed to participate in the preparation of Primary Four, Secondary Four, a Secondary text for the changing school grade system in East and Central Africa, the fourth volume of the teacher training text and additional testing material. At an Executive Committee meeting held in Kano, Northern Nigeria February 25, 1965, immediately following the African Science Meeting, among other things agreement was reached on the list of African invitees. Thus began the task of negotiating with the ministries of the participating African countries to secure agreement on invitees (African university mathematicians can be recruited somewhat more easily because invitations can be extended directly to them.)

What conflict there was with Ministries about selecting participants centered around the desire of African Ministries 1) to send the same participants as in past years although the Steering Committee had been able to identify better trained and more experienced African writers, or 2) to send expatriates instead of African. The Steering Committee remained firm in seeking approval of its nominees, arguing that the program's timetable did not allow time for training completely inexperienced writers. In addition, the Committee refused to accept expatriates because it felt that they could not have a long term commitment to African mathematics education. By June 30, 1965 a group of African participants far superior in mathematics training and writing ability to those of prior Workshops had been invited and had indicated their desire to attend. (Lists of the African participants, Appendix A and of the U.S. participants, Appendix B are attached.)

Courses for Eastern Nigeria, Liberia and Malawi/Zambia

Earlier reports to AID (March 4, 1964 and January 31, 1965) described eleven courses held in the participating countries to train teachers and supervisors of experimental classes. Following these initial courses, requests were received

for follow-up courses. In fact, many more requests were received than could be held with the funds for this purpose remaining in the contract. Moreover, the contract limited the number of courses to not more than eleven during the period ending June 30, 1965. Because there were adequate funds for three additional courses because it was felt essential to the program that second courses be held in Eastern Nigeria and Liberia and a first course for Malawi/Zambia and because permission had been sought as early as October 27, 1964 to hold these additional courses, EST committed itself to the countries concerned. Therefore, during the period covered by this report, the following courses were held:

Eastern Nigeria

Site: Institute of Education, University of Nigeria, Nsukka

Directors: Dr. A. Babs Faḡunwa, Director, Institute of Education,
University of Nigeria
Dr. Onyerisara B. Ukeje, University of Nigeria

Lecturers: Professor George Springer, Indiana University, Bloomington,
Indiana
Dr. Ian W. McInnes, Advanced Teacher Training College, Owerri
Dr. Onyerisara B. Ukeje

Demonstrators: Mrs. Grace Nogo, St. Paul's School, Nsukka

Participants: Twenty-nine Tutors

Dates: January 6 - 15, 1965

Liberia

Site: Cuttington College, Suacoco

Organizers: Mrs. Doris Banks-Henries, Department of Education, Monrovia
Dr. John H. Gay, Cuttington College

Lecturers: Dr. Kenneth Wegner, Cuttington College (Carleton College, Northfield, Minnesota)
Dr. John Gay
Dr. H. M. Thompson, University of Liberia, Monrovia (Cornell University, Ithaca, New York)
Miss Edith Kyle, Cuttington College
Mrs. Virginia Sherman-Boyd, University of Liberia

Demonstrator: Miss Lucy Addy, Achimota School, Accra, Ghana

Participants: Nine teacher trainers and secondary teachers and thirteen primary teachers

Dates: January 25 - February 12, 1965

Malawi/Zambia

Site: Chichiri School, Blantyre, Malawi

Organizers: Ministry of Education, Malawi
Ministry of Education, Zambia

Lecturers: Professor B. J. Pectis, University of North Carolina, Chapel Hill, N. C.
Mrs. Mary Neville, USAID, Lusaka, Zambia
Mr. Frank Kazembe, Ministry of Education, Blantyre

Participants: Eighteen Malawian and fifteen Zambian primary teachers, inspectors and tutors

Date: January 4 - 16, 1965

(Under Amendment #3 to RES-21 of June 24, the number of courses which could be held up to June 30, 1965 was increased to fourteen.)

While the desire of both ESI and AID to continue the program was never in doubt, without an amendment continuing the program beyond June 30, it was impossible to make commitments during the spring to participating countries, to U.S. mathematics lecturers, etc. Therefore, the lack of a new amendment inhibited the holding of courses during the summer of 1965. Of all the requests received for 1965 summer courses, those of Ghana and Sierra Leone seemed most important because both countries had well organized experimental classes in progress and needed help in training teachers to use the next successive level. Therefore, during the Spring of 1965, tentative arrangements were made to hold courses in those countries during the summer of 1965.

Publication and Distribution of the Entebbe Mathematics Series

As indicated in the January 30, 1965 Progress Report to AID, Silver Burdett Company of Morristown, New Jersey, the educational publishing subsidiary of Time Inc., was the successful bidder for publishing and distributing the manuscripts written at the 1964 Workshop. While it had been hoped and expected that the publication process would be completed by the end of February 1965 so that the next level of materials would be available to experimental schools in March, the last of the manuscripts, Secondary Three, was not in print until June 1965. So that schools would not discontinue participating in the program, a few reproductions of the first chapters of Primary Three and Secondary Three were sent such schools by air during March, April and May. In May Silver Burdett indicated that it was reviewing its immediate publishing intentions regarding Tropical Africa and that it was more than likely that it would not wish to publish the manuscripts which would be prepared at the 1965 Workshop,

During the report period there was a significant increase in experimental use of the Series. By the end of the period the texts were being used in 297 primary classes and 169 secondary classes, a total of 466 classes. Detailed country-by-country information indicating use at successive levels is indicated in Appendix C.

During the report period it also became clear that at the primary level there was a desire for more widespread use than a research program could support. Kenya and Tanzania indicated that they wished to adopt an Entebbe type mathematics program and to use it throughout their countries as soon as arrangements could be made for an adequate supply of texts and for training teachers to use them. Moreover, it seemed likely that the remaining participating East and Central African countries would come to the same decision soon and that participating West African countries would not be far behind. Therefore, ESI staff concerned with the program devoted themselves to three related problem areas during the period: 1) Defining the maximum number of classes at each grade level which would provide adequate experimental use, 2) Attempting to reach agreement with AID regarding the matter of copy writing the Series, and 3) Preparing a plan for widespread training of teachers (in addition to the program for training successive grade levels of teachers of experimental classes).

1) Several discussions took place among Steering Committee members and with AID staff to secure agreement on an appropriate number of trial classes for each participating country. After careful consideration, it was agreed that not more than thirty at each grade level in each participating country (except thirty per region for Nigeria) would provide an adequate sample. This decision was incorporated in Amendment 3 of EES-21. The related question of how large quantities of texts could be made available to countries wishing to adopt the program on a national basis was not resolved, is still being considered, and in turn, is related to the copyright question.

2) Since the beginning of the African Mathematics Program ESI has stressed the need to copyright texts developed under the Program. However, ESI has been informed that it is contrary to AID policy to allow materials developed under contracts with it to be copyrighted. (The National Science Foundation takes the opposite view). ESI believes that 1) copyright is necessary to protect the experimental nature of the program, i.e. to assure that the exact materials prepared by the developer are made available and used according to the design of the research; 2) copyright protection provides the most likely probability that the texts will be made commercially available in tropical Africa i.e. U.S. publishers will not market these texts if any publisher at any time may enter the market and publish and distribute the same texts; 3) copyright makes it possible to protect the materials until AID and ESI have had an opportunity together to explore the many requirements of widespread use and the best methods of satisfying these requirements.

Disagreement over the copyright question remained a critical issue during the Spring 1965 negotiations concerning Amendment 3 to RES-21. In June ESI was required to assign its copyright of the texts to AID as a condition to AID's signing Amendment 3. At the same time AID agreed that it would not allow anyone else to reproduce the materials without consulting ESI. Since AID does not wish to become involved in administering copyrighted materials ESI remains willing to do so with the understanding that it will inform AID of its decisions in this area. Also in June ESI was informed that it was not to copyright any future texts without permission from AID. Nevertheless, it remains clear to ESI that such texts must be copyrighted either in the name of ESI or AID.

3) A plan for the widespread training of teachers. See below.

Widespread Training and Retraining of African Mathematics Teachers

As indicated above and on Page 2 and 8 of the January 30, 1965 Progress Report

African participants and ministries began in the Spring of 1964 to press ESI for a plan to bring about the widespread training and retraining of teacher trainers and teachers of modern mathematics. (This program is not to be confused with the AID supported program to hold courses in each participating country to train teachers to use successive grade levels in trial classes in order to secure feedback on the appropriateness of the texts for Tropical Africa.) A small group at the 1964 Workshop sketched a plan for two All-Africa Institutes, each to be held for a four week period during the summers of 1966 and 1967. It would be the purpose of these institutes to train a small core of teacher trainers and a ministry or institute of education officer from each country who, with the assistance of African university mathematicians, could in turn undertake the training and retraining of their colleagues and of the hundreds of primary teachers in their country.

Support for this new program was sought from AID during the spring of 1965. The Agency agreed on the need for and feasibility of the plan. However, the REMS office decided that it could not support the new program because of its limited funds and because the plan was concerned with implementation rather than research. Late in the spring the Ford Foundation agreed 1) to underwrite a small group at the 1965 Workshop who would prepare a final plan for the 1966 and 1967 Institutes and 2) to consider a request for support of these Institutes after reviewing the plan.

Follow-up on Syllabus

Pages 5 and 6 of the January 31, 1965 Report noted that a draft syllabus on modern mathematics and some specimen examination questions were submitted to the West African Examinations Council (WAEC) and Cambridge Examinations Syndicate in January 1965. It was hoped that the WAEC and the Syndicate, the College Boards of West and East Africa respectively, would agree to offer an examination based on the syllabus when students completed Secondary Five. The lack of assurance that

such an examination would be offered had deterred teachers from trying and students from giving full attention to the Secondary course except as auxiliary material.

Professor Robert P. Dilworth of California Institute of Technology agreed to stop at Cambridge and Accra in the course of traveling to the February Kano Executive Committee meeting, in order to answer questions of the examining bodies and to explain the urgency of our request. Professor Dilworth received a most cordial welcome from both groups and assurance that neither wished to impede the spread of modern mathematics to Africa. Later in the Spring formal acknowledgements of receipt of the Syllabus (Appendices D and E) were received which indicated that the Syllabus would be submitted to the appropriate committees of each examining body.

In conclusion, ESI wishes to express its thanks to the REPAS office of AID/W, to the Contract Officers of AID/W responsible for RES-21 and to the educational advisers of the AID missions in the participating countries for their cooperation in this joint effort to improve mathematics education in Tropical Africa.

NON-UNITED STATES DEFINITE PARTICIPANTS

- Dr. Iya Abubakar, Ahmadu Bello University, Zaria, Northern Nigeria
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1965 AFRICAN MATHEMATICS WORKSHOP

UNITED STATES PARTICIPANTS

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Professor Robert P. Dilworth, California Institute of Technology, Pasadena 4,
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Professor Ross Finney, Princeton University, Princeton, New Jersey
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Professor Izaak Wirsup, University of Chicago, Chicago, Illinois
Professor John Yarnelle, Hanover College, Hanover, Indiana

APPENDIX G

EDUCATIONAL SERVICES INCORPORATED

NUMBER OF EXPERIMENTAL CLASSES USING INTERDE MATHEMATICS SERIES

AS OF SEPTEMBER 1, 1965

<u>Country</u>	<u>Primary One</u>	<u>Primary Two</u>	<u>Primary Three</u>	<u>Secondary One</u>	<u>Secondary Two</u>	<u>Secondary Three</u>	<u>Total</u>
Ethiopia	12			10			22
Ghana	21	11		15	6		53
Kenya	60	2	1	1	1		65
Liberia	14	6	2	6	3	2	33
Malawi	9	5		4	2		20
Nigeria	15	12	6	16	12	5	66
Sierra Leone	7	4		8	7		26
Tanzania	45	20	3	14	14		96
Uganda	20	1		30	4		55
Zambia	11	10		9			30
	<u>214</u>	<u>71</u>	<u>12</u>	<u>113</u>	<u>49</u>	<u>7</u>	<u>466</u>

UNIVERSITY OF CAMBRIDGE
LOCAL EXAMINATIONS SYNDICATE

Cambridge, England

When replying please quote TSW/NB/10/6/2

2 February 1965

Dear Mr. Bradley,

Many thanks for your two letters of 14 January and 22 January, and for the accompanying material. Our Mathematics Subject Committee will be considering the syllabus, and the scheme will be discussed at the meetings of our Advisory Committees which will be held in Uganda, Kenya and Tanzania in May and June of this year. Mr. Garbutt will certainly be letting you know whether there is any further information which we may require or any points which arise from consideration of the syllabus here and in East Africa.

Yours sincerely,

T. S. Wyatt

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THE WEST AFRICAN EXAMINATIONS COUNCIL

Reg.4.12/ESI/167

HEADQUARTERS OFFICE
PRIVATE POST BAG
ACCRA

12th July 1965.

Dear Sir,

ENTEBSSE MATHEMATICS SYLLABUSES FOR
O-LEVEL EXAMINATION

Thank you for your letter on the above subject dated January 14, 1965 and its enclosures.

2. The authority for approving new syllabuses is our School Examinations Committee acting on the advice of the respective Subject International Panels. Since receiving your syllabus, it has not been possible to submit it to our Mathematics Panel for consideration hence no recommendation has been made to the School Examinations Committee yet.

3. It is, however, planned to call meetings between September and December or early 1966 to consider your syllabus and any other "New" Mathematics syllabus (that will have been received). Recommendations made by the Panel will be brought before the School Examinations Committee in March, 1966.

4. In the meantime, however, it has been agreed to set papers on the Entebbe Mathematics for the West African Examinations Council General Certificate of Education Examination in June and also for the Joint Examination for the School Certificate and General Certificate of Education in November/December, in 1967 for the Schools that have already embarked on the course. The former examination is held in Ghana, Sierra Leone and the Gambia and the latter in Nigeria.

5. The syllabus will be published in our book of Regulations and Syllabuses after it has been approved by the School Examinations Committee.

6. For use at our National Working Party and International Panel Meetings, we shall require Thirty-Six copies of each of the Syllabus and the Specimen Papers and would be grateful to receive these as soon as possible. I shall be obliged if you will let me know by return whether you will be able to supply the number of copies requested.

7. Please accept my apology for the long delay in sending this reply.

Yours faithfully,

E. K. Somna-Winfe
for REGISTRAR

3589-65

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