OFFICE OF INSPECTOR GENERAL
U.S. Agency for International Development

USAID Has Advanced STEM Education in Egypt Despite Some Implementation Challenges

AUDIT REPORT 8-263-18-002-P
FEBRUARY 9, 2018

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MEMORANDUM

DATE: February 9, 2018

TO: USAID/Egypt Mission Director, Sherry Carlin

FROM: Regional Inspector General/Frankfurt, James C. Charlifue /s/

SUBJECT: USAID Has Advanced STEM Education in Egypt Despite Some
             Implementation Challenges (8-263-18-002-P)

This memorandum transmits the final report on our audit of USAID/Egypt's Science, Technology, Engineering, and Mathematics (STEM) School Project. Our audit objectives were to determine whether (1) project activities were successful in advancing science, technology, engineering, and mathematics for targeted students, and (2) the project built the Ministry of Education's capacity to replicate and sustain the STEM schools in Egypt. In answering the second objective, the audit examined English language instruction and cost-sharing requirements during implementation. In finalizing the report, we considered your comments on the draft and included them in their entirety, excluding attachments, in appendix C.

The report contains three recommendations to improve cost-sharing contributions oversight. After reviewing information you provided in response to the draft report, we consider two resolved but open pending completion of planned activities (recommendations 2 and 3), and one unresolved (recommendation 1).

For recommendations 2 and 3, please provide evidence of final action to the Audit Performance and Compliance Division. For recommendation 1, please provide us the amounts of cost-sharing allowed or unallowed within 30 days, copying the Audit Performance and Compliance Division.

We appreciate the assistance you and your staff extended to us during the audit.

Office of Inspector General, U.S. Agency for International Development
Frankfurt, Germany
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INTRODUCTION

Prospects for long-term stability and prosperity in Egypt, a key U.S. ally, are hindered by Egypt's poor education system. The 2012-2013 Global Competitiveness Report[1] ranked the quality of Egypt's math and science education 139th out of 144 countries, and Egyptian students have generally scored well below international averages on tests in these subjects. Consequently, the Egyptian Government recognized the need to improve math and science education to bolster competitiveness and adequately prepare students for an increasingly science- and technology-based workforce.

Inspired by U.S. science, technology, engineering, and mathematics (STEM) education, in 2011, with assistance from USAID, the Egyptian Ministry of Education (MOE) opened its first STEM secondary school which served boys in the city of 6th of October. While this demonstrated MOE's commitment to STEM education, more needed to be done to expand and strengthen it, such as developing a standard curriculum. To assist MOE in its effort, in August 2012 USAID/Egypt awarded a 4-year, $25 million cooperative agreement to World Learning to provide STEM education to interested and qualified students through the STEM School Project. In July 2016, USAID extended the award for a year and increased the ceiling to $30 million.

The USAID Office of Inspector General (OIG) conducted this audit to determine whether (1) project activities were successful in advancing science, technology, engineering, and mathematics for targeted students, and (2) the project built MOE's capacity to replicate and sustain STEM schools. In answering the second objective, the audit examined English language instruction and cost-sharing requirements during implementation.

To conduct our work, we interviewed mission and project officials, MOE staff, and students; visited five STEM schools; and reviewed the award, work plans, and progress reports. We followed generally accepted government auditing standards. Appendix A presents our scope and methodology.

SUMMARY

USAID/Egypt's STEM School Project achieved several key outcomes. In particular, it reached targeted students with instruction and increased the capacity of MOE staff, school administrators, and teachers. As of June 2016, the Egyptian Government had established nine STEM schools, well beyond the three to five initially expected, demonstrating staff's capability to replicate the STEM model. Staff have become adept at selecting and admitting teachers and students; preparing, administering, and evaluating

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[1] World Economic Forum, Egypt Economy Profile, "The Global Competiveness Report 2012-2013," accessed on March 30, 2017.

student assessment tests; and managing information technology systems that support STEM schools.

Yet there were some implementation problems—unfinished tasks and some aspects that required adjustment in a 1-year extension to the award. Most notably, English language instruction and cost sharing proved insufficient. In response, World Learning developed an online resource to boost the English proficiency of both students and teachers. In addition, even after its cost-sharing contribution was reduced, World Learning still needed to be more transparent in reporting its contributions and meeting its commitment in order to support the project's impact on education.

We made three recommendations regarding cost sharing.

BACKGROUND

STEM is a curriculum that emphasizes an interdisciplinary, applied approach to learning science, technology, engineering, and mathematics. MOE introduced STEM to help students develop critical thinking skills and become more competitive in the global economy. USAID selected World Learning, in collaboration with three U.S.-based technical partners,[2] to help MOE implement and sustain STEM education based on the consortium's extensive collective experience in this area.

USAID/Egypt's STEM School Project had five desired outcomes: (1) increasing student interest and achievement, with special emphasis on girls and poor students; (2) developing an effective high school model focused on science and mathematics for gifted students; (3) building the capacity of a highly qualified team of STEM professionals; (4) strengthening MOE's capacity to replicate and sustain the STEM model; and (5) supporting MOE's efforts to implement an advanced STEM curriculum, conduct student assessments, and train STEM teachers.

To achieve these objectives, USAID required World Learning to help MOE establish three to five STEM schools. Doing this required designing and implementing a STEM school model and providing extensive training and technical assistance to selected MOE staff, teachers, and administrators. Above all, it required changing MOE's approach to education by emphasizing student comprehension rather than rote memorization, and then testing students to measure their learning.

In addition, criteria and processes for selecting students, teachers, and administrators needed to be established. Obtaining support from the local governments and communities for STEM schools, especially in poor communities, required other key

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[2] The 21st Century Partnership for STEM Education (21PSTEM), Teaching Institute for Excellence in STEM (TIES), and The Franklin Institute (TFI).

activities, such as establishing boards of trustees and forging partnerships with universities, research institutes, and the private sector.

PROJECT HELPED MINISTRY OF EDUCATION ADVANCE STEM EDUCATION FOR TARGETED STUDENTS AND REPLICATE STEM MODEL

We found that the project achieved several key outcomes. Specifically, the project helped advance STEM education for targeted students—including girls, like those pictured below, who attend Dakahlia STEM school—and helped build the capacity of MOE staff, school administrators, and teachers. As of June 2016, the Egyptian Government had established nine STEM schools, exceeding the initial target of three to five and demonstrating the MOE's capability to replicate the STEM model. Appendix B presents a list of STEM schools in operation.

First-year female students at Dakahlia STEM School perform lab experiments. Photo: OIG (April 13, 2016)

With project assistance, MOE did the following:

- Developed and implemented a STEM curriculum.
- Established an admission process to select gifted students for STEM education.
- Trained 181 teachers to teach at STEM schools, surpassing its target of 85.

- Trained 185 MOE staff to manage and support STEM schools, exceeding its target of 35. (Training included developing manuals like those pictured below.)

- Issued five decrees supporting STEM schools.

- Established a board of trustees at each STEM school.

- Procured equipment and materials to help students and teachers gain hands-on experience.

- Prepared STEM manuals for instructors and trainees.

These training manuals are provided to new STEM teachers. Photo: OIG (May 5, 2016)

The project transferred skills to Government education staff. Through training and technical assistance, MOE staff developed the teacher selection process for STEM schools and the admission process for STEM students, and now manages both. Staff can prepare, administer, and evaluate student assessment tests as well as manage information technology systems needed to support STEM schools.

The project also reached targeted students and boosted their international competitiveness. The project sought to benefit bright students—recognizing that

children from low-income families typically attend public school[3]—and estimated that, 70 percent of STEM students were from Egypt's public schools, selected based on academic proficiency and aptitude. According to STEM school officials, public school students in Egypt had neither won any international science and technology competitions nor received scholarships from international universities. However, as of February 2017, STEM students had won over 115 prominent places in local and international competitions, and more than 45 students had received international scholarships or placements in exchange programs. These accomplishments helped garner additional support for STEM, reflected in the Egyptian Government's plans to ultimately open a STEM school in each of the country's 27 governorates.

Key factors contributing to these outcomes were the ability of the three U.S.-based technical partners to help MOE adopt STEM and the commitment of MOE staff to STEM despite leadership changes within the Egyptian Government.

PROJECT DID NOT FULFILL ALL USAID LANGUAGE OR COST-SHARING REQUIREMENTS

Despite these positive outcomes, we found that several requirements were not fulfilled during the original period of the award—a period marked by political and social change in Egypt. Accordingly, the mission extended the award by a year so that World Learning could address these requirements, most notably English language instruction and cost sharing.

ENGLISH LANGUAGE INSTRUCTION PROGRAMS WERE INADEQUATE DURING INITIAL AWARD PERIOD

The award required World Learning to provide English language instruction to both students and teachers since core STEM classes are taught in English. This training would be offered outside the classroom through a mix of activities. Students and teachers would attend 2- to 3-week intensive summer training. Teachers would also receive additional training through online resources and instructor-led courses, supported by coaching as needed until teachers reached a satisfactory level of proficiency. A robust, effective English instruction program is necessary to sustain students' international competitiveness and enable teachers to support students adequately.

Soon after the project started, it became apparent that students and teachers needed a more thorough English program than originally designed. To assist with the additional training needed, World Learning offered after-school English classes for students throughout the school year until fall 2015. World Learning then developed an online resource called E-STEM for students to use in conjunction with their course work.

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[3] Organisation for Economic Co-Operation and Development, "Schools for Skills: A New Learning Agenda for Egypt," 2015.

However, we found little evidence that students used E-STEM to improve their English skills. Meanwhile, teachers only received an after-school English class for the project's first year, and the online resources and instructor-led courses were not offered. These problems revealed World Learning's lack of planning for an effective and sustainable English program to help STEM students and teachers.

Since the award extension, World Learning incorporated changes and made E-STEM available for teachers to address MOE's remaining concerns about teachers' English proficiency. This could help strengthen and sustain the English program for both students and teachers. Since the program has ended, we are not making any recommendations in this area.

WORLD LEARNING DID NOT MEET THE ORIGINAL COST-SHARING REQUIREMENT

Cost sharing refers to the resources a recipient contributes to the total cost of a USAID-financed project; thus, cost sharing constitutes an integral part of achieving a project's goals and sustaining its impact. USAID policies require agreement officer's representatives to monitor recipients' progress toward meeting their cost-sharing requirements, which must be verifiable from the recipients' records. If recipients do not meet these requirements, USAID can reduce future funding, require the recipient to reimburse USAID for the amount of the shortfall on termination, or reduce the cost-sharing amount.

Although the award originally required slightly more than $5 million in cost-sharing contributions, World Learning reported contributing approximately $1.4 million through March 2016. World Learning had expected to meet roughly 70 percent of the required amount by providing supplemental books obtained from the International Book Bank (IBB), but soon after the shipment arrived in summer 2015, the Egyptian Government informed World Learning that some books contained maps that did not reflect Egypt's official borders and must be returned. As a result, MOE asked World Learning not to import any more books. Although some books were not accepted, World Learning still claimed them as a cost-sharing contribution.

Mission officials said they had communicated to World Learning concerns over its lack of efforts to meet its cost-sharing commitments. While the negotiations were underway for an award extension, IBB went out of business. As a result, mission officials said that World Learning wanted to reduce its cost-sharing commitment by half, but it demonstrated no effort to identify alternate cost-sharing resources. Ultimately, under the award extension, USAID agreed to reduce cost sharing to $3 million and required World Learning to submit a revised cost-sharing plan and strategy, submitted and approved in the fall of 2016.

In addition, World Learning could not provide the audit team adequate supporting documentation for its reported cost-sharing contributions. For example, we asked World Learning to provide supporting documentation for $189,069 in salaries, consultant fees, and in-kind contributions reported as cost sharing. World Learning,

however, provided only summary spreadsheets that lacked necessary details for confirmation. The lack of documentation, coupled with an additional $1.6 million in contributions that was needed by the agreement's end date of August 27, 2017, increased the risk that the full cost-sharing requirement would not be met.

CONCLUSION

USAID has helped the Egyptian Government establish STEM education during a period of significant political and social change. However, if USAID designs any follow-on STEM projects in Egypt, it should take into account the implementation challenges this one had. In addition, before closing out this project, USAID can still take action to enforce the original requirements and demonstrate that it is committed to achieving the ultimate aims of cost sharing: to maximize USAID investments and promote the long-term sustainability of development impacts.

RECOMMENDATIONS

We recommend that USAID/Egypt take the following actions:

1. Determine the allowability of $189,069 in unsupported cost-sharing contributions reported as of March 31, 2016, and factor the determination into identifying any shortfall at the conclusion of World Learning's award.

2. Determine whether cost-sharing amounts claimed for the books rejected by the Egyptian Government should be counted toward World Learning's required cost-sharing contribution, and factor the determination into identifying any shortfall at the end of World Learning's award.

3. Conduct and document a comprehensive review of the total cost sharing reported by World Learning and its supporting documentation after March 31, 2016, and recover any identified shortfall.

OIG RESPONSE TO AGENCY COMMENTS

We provided USAID/Egypt with our draft report on October 17, 2017, and we received its response on December 4, 2017, which is included, without attachments, as appendix C.

The report included three recommendations. We consider two resolved but open pending completion of planned activities (recommendations 2 and 3), and one unresolved (recommendation 1) for the reason stated below.

We acknowledge management decisions on recommendations 2 and 3. However, we do not acknowledge the management decision on recommendation 1 because, according to Automated Directives System (ADS) 595.3.1.2 a, in order to make a management decision on a questioned cost recommendation, the agreement officer must first specify the amount of questioned costs allowed and/or disallowed.

In our evaluation of management's response, we also reviewed management's suggested edits and made changes we considered appropriate.

APPENDIX A. SCOPE AND METHODOLOGY

We conducted our audit from February 2016 through October 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The audit objectives were to determine whether (1) project activities were successful in advancing science, technology, engineering, and mathematics for targeted students, and (2) the project built MOE's capacity to replicate and sustain STEM schools. In answering the second objective, the audit examined English language instruction and cost-sharing requirements during implementation.

In planning and performing the audit, we reviewed the project documents and assessed the extent of oversight that USAID/Egypt and the implementing partners used to manage the program. Reviewed documents included project implementation work plans, monitoring and evaluation plans, quarterly progress reports, and site visit reports.

The audit covered the period from the project's inception in August 2012 through March 2016. We conducted fieldwork from April through June 2016, visiting the offices of USAID/Egypt, World Learning, and the Ministry of Education in Cairo, and five of the nine STEM schools: 6th of October boys' school, Maadi girls' school in Cairo, and schools in Alexandria, Assuit, and Dakahlia. We selected the five schools that the implementer was responsible for under the project. The remaining four schools were opened by the MOE and received support from the project under the award extension. We learned that MOE opened two more schools after the fieldwork, which made a total of 11 STEM schools. We also conducted interviews with World Learning's U.S.-based partners (21PSTEM, TIES, and TFI) and its subcontractor, Management Systems International.

To determine if USAID/Egypt's STEM activities were achieving project objectives, we interviewed USAID/Egypt's key officials; the implementer and its four subcontractors/technical partners; MOE officials; and school teachers, administrators, and students at all five STEM schools we visited. We also observed student presentations, and we validated data for year 3 of the project. We examined key documentation, including the cooperative agreement, the project's annual work plans, quarterly progress reports, performance management plans, monitoring and evaluation reports, and cost-sharing reports. We reviewed USAID policies on cost-sharing contained in ADS 303. We verified data reported in the project's performance management plan, and determined if key activities were implemented or completed according to the cooperative agreement.

For our testing of cost-sharing contributions, we judgmentally selected $189,069 in cost-sharing contributions out of the total of $1.4 million in reported cost sharing as of

March 31, 2016. The sample consisted of $10,389 in salaries and consultant fees and $178,680 in various in-kind contributions. The sample was based on selected areas of audit interest identified during fieldwork. We used a judgmental sample because audit resources were limited and financial testing was not the primary focus of the audit. The results of our sample cannot be projected to the population of cost-sharing contributions as of March 31, 2016.

In answering the audit objectives, we did not rely extensively on computer-processed data. We relied instead on evidence from interviews, site visits, and document reviews. We believe our substantive testing was sufficient to support the audit's findings.

APPENDIX B. STEM SCHOOLS

Secondary public education in Egypt covers 3 years: 10th to 12th grade. Students attending a STEM school need to complete each grade to advance. Each school is designed to accommodate approximately 150 students per grade.

STEM School	Date of School Opening	Comments
1. 6th of October STEM School (All Boys)	September 2011	Opened before project started. Technical assistance provided by World Learning and partners.
2. Maadi STEM School (All Girls)	September 2012	Opened with project support.
3. Alexandria STEM School	October 2015	Opened with project support.
4. Assuit STEM School	October 2015	Opened with project support.
5. Dakahlia STEM School	October 2015	Opened with project support.
6. Ismailia STEM School	October 2015	Opened by MOE and supported by the project, as part of the award extension.
7. Luxor STEM School	October 2015	Opened by MOE and supported by the project, as part of the award extension.
8. Kafr El Sheikh STEM School	October 2015	Opened by MOE and supported by the project, as part of the award extension.
9. Red Sea STEM School	October 2015	Opened by MOE and supported by the project, as part of the award extension.
10. Gharbia STEM School	September 2016	Opened after auditors' fieldwork, not part of the award extension.
11. Menofia STEM School	September 2016	Opened after auditors' fieldwork, not part of the award extension.

APPENDIX C. AGENCY COMMENTS

MEMORANDUM   December 4, 2017

TO: James Charlifue, Regional Inspector General/Frankfurt

FROM: Sherry F. Carlin, Mission Director, USAID/Egypt /s/

SUBJECT: USAID/Egypt Response to RIG/Frankfurt Draft Audit Report Dated October 17, 2017 – USAID Has Advanced STEM Education in Egypt Despite Some Implementation Challenges (8-263-18-XXX-P)

This memorandum transmits USAID/Egypt's comments on the subject performance audit report.

Suggested Changes to the Draft Audit Report:

The Mission suggests limited edits to the draft report before its final issuance by RIG/Frankfurt. Suggested edits are explained in the attachment.

Mission Comments to Audit Recommendations:

Recommendation No. 1: Determine the allowability of $189,069 in unsupported cost-sharing contributions reported as of March 31, 2016, and factor the determination into identifying any shortfall at the conclusion of World Learning's (WL's) award.

Mission Management Decision: USAID/Egypt concurs with this recommendation. Using statistical sampling, USAID/Egypt will perform a comprehensive review of the cost-share contribution, including the $189,069 in costs referred to in this recommendation. Supporting documents will be examined to assess the reasonableness, allocability, and reliability of the costs. If there are any ineligible costs, the Agreement Officer will consider the options contained in ADS 303 for addressing these costs.

USAID/Egypt requests concurrence with our management decision for Recommendation 1.

Target Completion Date for Recommendation 1: March 31, 2018.

Recommendation No. 2: Determine whether cost-sharing amounts claimed for the books rejected by the Egyptian Government should be counted toward WL's required cost-sharing contribution, and factor the determination into identifying any shortfall at the end of WL's award.

Mission Management Decision:
USAID/Egypt concurs with this recommendation. Per the updated schedule submitted by WL on November 8, 2017 (referred to in 1 above), WL has now claimed cost-share only for $350,213 for the books that were accepted by the Government of Egypt. USAID/Egypt will verify the amount claimed with supporting documents to validate this amount. If there are any ineligible costs, the Agreement Officer will consider the options contained in ADS 303 for addressing these costs.

USAID/Egypt requests concurrence with our management decision for Recommendation 2.

Target Completion Date for Recommendation 2: March 31, 2018

Recommendation No. 3: Conduct and document a comprehensive review of the total cost sharing reported by WL and its supporting documentation after March 31, 2016, and recover any identified shortfall.

Mission Management Decision:
USAID/Egypt concurs with this recommendation. USAID/Egypt will require WL to submit another schedule detailing cost-sharing contributions from April 1, 2016 through the end of the award on October 31, 2017. Upon receiving this schedule, USAID/Egypt will use statistical sampling to conduct a comprehensive review, including examination of supporting documents, to assess the reasonableness, allocability and reliability of the costs.

USAID/Egypt requests concurrence with our management decision for Recommendation 3.

Target Completion Date for Recommendation 3: March 31, 2018

Extended Time Taken to Issue the Final Draft Audit Report:

The audit was initiated by a notification letter sent February 21, 2016, and the fieldwork took place from April to June 2016. On November 1, 2016, the Mission received the RIG/F exit conference agenda (discussion draft), which was discussed with the RIG/F on November 7, 2016. Almost a year later, on October 17, 2017, the Mission received the RIG/F draft audit report requesting the Mission to provide its comments on the report. Given the significant period of time that has elapsed since the audit was completed, the utility of the audit recommendations is severely limited.

Attachment: USAID/Egypt Suggested Edits to STEM Draft Audit Report

APPENDIX D. MAJOR CONTRIBUTORS TO THIS REPORT

The following people were major contributors to this report: James C. Charlifue, regional inspector general; Saiming Wan, audit manager; Juana Morales, auditor; Roshanak Salimi, auditor.