Egypt STEM Schools Project
(ESSP)

ANNUAL REPORT - SEPTEMBER 2016

ESSP 4th Annual Report, September 2016

ANNUAL REPORT
OCTOBER 2015 - SEPTEMBER 2016

QUARTERLY PROGRESS REPORT
JULY – SEPTEMBER 2016 (Q4)

Egypt STEM Schools Project
(ESSP)

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Acronyms

21PSTEM	The 21st Century Partnership for STEM Education
AIP	Annual Implementation Plan
BOT	Board of Trustees (school)
CA	Cooperative Agreement
CCIMD	Center for Curriculum and Instructional Material Development
CDRS	Curriculum Design Review Studio
COP	Chief of Party
COS	Classroom Observation Scale
DCOP	Deputy Chief of Party
ESSP	Egypt STEM Schools Project
ESF	Education Support Fund
ELP	English Language Program
GILO	Girls' Improved Learning Outcomes Project (USAID)
GOE	Government of Egypt
GTM	GoToMeeting
HR	Human Resources
IAT	It's About Time
ICT	Information and Communications Technology
LO	Learning Outcome
MAP	Management Assessment Protocol
M&E	Monitoring and Evaluation
MoE	Ministry of Education
MOHE	Ministry of Higher Education
MSI	Management System International
NCEEE	National Center for Educational Evaluation and Examination
NCERD	National Center for Educational Research and Development
PARLO	Proficiency-based Assessment and Reassessment of Learning Outcomes
PAT	Professional Academy of Teachers (MoE)
PDI	Professional Development Institute
PMP	Performance Monitoring Plan
QPR	Quarterly Progress Report
SCOPE	Standards-based Classroom Observation Protocol for Egypt
SEPUP	Science Education for Public Understanding Program
STEM	Science, Technology, Engineering and Math
STTA	Short Term Technical Assistance
TDC	Technology Development Center
TIES	Teaching Institute for Excellence in STEM
TFI	The Franklin Institute
TILO	Technology for Improved Learning Outcomes (USAID)
TOT	Training of Trainers
WL	World Learning
US	United States of America
USAID	United States Agency for International Development

Annual Overview

To make STEM schools more accessible to high achieving students nationwide, the past project year and the academic year 2016/17 have witnessed yet another expansion for the STEM schools to cover more governorates within Egypt and make the total number of schools reach eleven. This would not have happened except through ESSP's direct collaboration with the Central STEM Unit and the STEM Executive committee within the Ministry.

ESSP continued to collaborate with the Ministry of Education through its Central STEM Unit and Executive Committee, in addition to the Ministry's Centers, Counselors' Office and the Professional Academy of Teachers (PAT). The Central STEM Unit, being the technical arm of the Ministry for its STEM education (where the Centers, Counselors' Office and PAT are represented); worked closely with ESSP and its US consultants to build its own capacity and transfer know-how to the different levels of the Ministry, its Local STEM Committees and the STEM schools, thus, further institutionalizing the STEM system within the Ministry. The Executive Committee also adopted an instrumental executive role in resolving issues related to the opening of new schools and the successful operation of new and existing ones, thus, clearly reinforcing the establishment of the STEM system.

This combination of technical ability and executive prowess has been the base upon which STEM schools are built and the lifeline for their survival. The culmination of this cooperation within the Ministry resulted, last year, in the opening of four new schools in addition to the three directly supported by the project. At the start of the 2015/16 school year, seven co-ed schools opened at once, which shows the commitment of the Ministry to STEM education and its plans to expand its footprint to serve more students nationwide. This action suddenly expanded ESSP's support to the Ministry to nine schools rather than a maximum of five as stated in its cooperative agreement. This 2016/17 school year two additional schools in Menufia and Gharbia were also opened by the Ministry despite of lack of infrastructure readiness, including the completion of student dormitories and equipment and furnishing for the labs. Also, the dorms in some of the schools that opened last year are still being completed.

Today there are eleven STEM schools opened nationwide; two of them in October and Maadi are fully matriculated with three grades in each school. Seven schools are hosting Grade 10 and 11 this year, and two schools are accepting students for grade 10 only this year. In total, and within the last year, the number of students enrolled in the STEM schools increased from about 700 students in the two schools of October and Maadi to almost 3,000 students in the eleven schools.

Through the STEM unit and independently, ESSP worked closely with the Center for Curriculum and Instructional Material Development (CCIMD), National Center for Educational Evaluation and Examination (NCEEE) and National Center for Educational Research and Development (NCERD) during the past year to advance curriculum, assessment and URT

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implementation that will better inform and serve the carrying out of activities during the extension.

MoE's Commitment to STEM

The commitment of the Ministry of Education to the STEM schools dwarfs any other support provided to the schools. The Ministry invested a large sum of money in the infrastructure of these STEM schools, and particularly this past year to open seven new schools at once, in addition to the annual operation cost of running eleven boarding schools. Each school building alone is estimated at about EGP 8 million, and each of the dorms (one for boys and another for girls) costs about EGP 11 million each, which means that the construction cost alone is about EGP 30 million per school, i.e., over EGP 300 million thus far for the eleven schools. It is estimated that the cost per student is about EGP 25,000 per year which indicates that the Ministry is paying annually EGP 75 million to only operate the schools, in addition to the capital investment deposited in their equipping and furnishing. This only shows how the GOE is serious about the institutionalization of the STEM system and its rapid expansion. The Executive Committee has played a major role in directing this interest and expansion in close collaboration with ESSP and USAID.

Areas of Advancement

During this past year, ESSP realized a number of successful activities on various fronts that pushed implementation forward as the project continued on track for the extension as it already started carrying out some of its extension related responsibilities in the last quarter of its fourth year.

Curriculum

In the past year ESSP moved forward with the STEM curriculum and conducted its final review to cement it as the curriculum of choice for Egypt's STEM schools. It added an eleventh challenge to its Grand Challenges and that is "Reduce and adapt to the effect of climate change". ESSP also started a concerted effort, in collaboration with CCIMD, spearheaded by its head Dr. Hazem, who led the drafting of the STEM curriculum standards in coordination with STEM teachers, US consultants, university professors and MoE Centers' experts. This effort is viewed as an essential deliverable under the ESSP extension and included for the first time coordination with the newly designed English language curriculum and learning outcomes. Efforts are presently ongoing with the CCIMD to finalize for Humanities after the STEM curriculum standards were laid out.

Assessment

ESSP took major strides in advancing the University Readiness Test (URT), replacing the ACT as part of the exit exams, which was previously used twice by the project until the URT

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was designed. Last June 2016 witnessed the administering of the URT for the first time after support was provided by the project to the Counselor's office and the NCEEE. The counselors attended several workshops on the developing of new test items, their alignment and the development of an item bank using the software FastTest. A pilot test was administered in the schools of Maadi and October where the results were analyzed and the real test implemented in June. ESSP sees this as a major advancement in its assessment achievements and plans to improve its instrument this year to apply it again before the end of the extension in both schools. Other workshops were conducted throughout the year for supervisors and members of the Local STEM Committees to be introduced to the STEM assessment system and to explore the possibility of creating an item bank for the mid and end of semester and year exams. The Proficiency-based Assessment and Reassessment of Learning Outcomes (PARLO) has also been deployed in all schools and the system uploaded onto the Ministry server so that the Technology Development Center (TDC) is able to manage and control its operation. PARLO is now functioning in all schools with capacity built at TDC and in schools through several training sessions to respectively manage it and proficiently use it.

Professional Development

The Professional Development Institute (PDI) was successfully conducted during the last academic year's spring break and last summer with further adjustments and enhancements every time. In the two PDIs 290 teachers were trained; 40 were experienced teachers, 250 developing/beginning teachers, 32 leaders, 95 supervisors, and 30 trainers. The professional development covered the areas of Curriculum, Assessment, Pedagogy, Capstone, Fab Lab, Practical Labs, TELIC, e STEM Online, Summer Camp, Coaching and training of trainers.

While the project does not expect to deliver a summer PDI, ESSP will deliver its spring break PDI during the last week of January and first week of February 2017 as the project will allocate the final three months of the extension period to closing out its activities, accounts and books in preparation for the end of the project in August 2017.

The project has also worked with PAT to certify trainers based on agreed upon competencies it developed for teachers in collaboration with PAT that will be used as a base for accreditation. For sustainability, the project started the process with PAT to create a pool of TOTs for all areas (Pedagogy, Curriculum, Curriculum practical, Assessment, English and Capstone).

Capstone Projects

The capstone process has enjoyed the development of an app that acts as a dashboard for students, teachers, capstone leaders and the capstone manager to access and manage the entire process with different levels of access and privileges. The capstone topics, while still under the same thematic topics that serve the Grand Challenges, have been changed to create a new set of problems for students at all grades. Journal questions have also been changed and streamlined this year and the entire process more standardized. ESSP is working closely with the STEM Unit's Capstone Manager who is receiving direct support from US consultants and basically taking control over the entire process. ESSP is also working with the schools so that the capstone materials are purchased from the respective governorates to allow the schools to experiment with

purchasing the material locally and for the capstone leaders to gain the necessary sourcing experience.

Google Drive Replacement

Google Drive and Google Apps have been the means for the STEM system users to access and manage its resources. The MoE opened talks this year with Microsoft to explore the possibility of it taking over the Google-based system and supporting it for the remaining life of the project and beyond. Microsoft was selected because they already have an ongoing contract to provide information technology services and solutions to the Ministry, and the STEM schools can be part of that umbrella contract. Microsoft has attended more than one presentation by the project and brought along several of its partners to understand the system and attempt to copy it on a Microsoft platform. ESSP is presently working with Microsoft to replicate the system with a more robust base so that it is structured with an expanded user base in mind and a more robust security.

PAT STEM Recruitment

The STEM recruitment system for teachers, principals, deputy principals and lab technicians was initially designed by ESSP and implemented in cooperation with PAT for the first year. More involvement from PAT was encouraged during the second and third years until PAT is now completely managing the STEM schools recruitment system. PAT runs an advertisement on its website that invites all candidates to apply using a comprehensive application adopted by PAT that lists all the necessary information pertaining to the candidate and his/her preference in terms of the school geographic location. Tests for English language (reading and writing online and listening and speaking face-to-face) and Tests of Concepts in each of the STEM subjects' content were administered by PAT this year in more than one location around the country to facilitate access to applicants. The results were scored by MoE counselors, sorted according to the scores achieved by each applicant, and recorded electronically by PAT for selection to take place. The best applicants were selected to take the PDI this summer. Following the PDI, interviews were conducted by the Ministry to make the final selection of teachers, with a committee at the Ministry tasked to select the principals and deputies. Although this recruitment process is now completely owned and operated by PAT, the number of teachers passing through this system is less than what the schools require, as more applicants are required now that more schools are opened.

The STEM Blueprint

ESSP created a website where all its project documentation resides. It initially established this resource for use by project staff and slowly populated it with all the project resources. A roadmap was created for users to navigate through these documents. During the past year, and after the establishment of the MoE's STEM Master domain, ESSP started transferring all of the project documents to create the STEM Blueprint. The STEM Blueprint houses all of the project training manuals, files and presentations in addition to Ministerial Decrees, forms and project

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documents in one place where they are searchable by topic, name and file format. The Blueprint is designed to act as a reservoir for all Ministry personnel to access STEM related documents and use the blueprint as a guide during the establishment of any new STEM school in the future. ESSP had several workshops with the STEM Unit to inform them about the use of the Blueprint and its importance. It also solicited feedback from the STEM Unit members to improve its design and content so that it is more helpful to its users.

Infrastructure

During the past year ESSP procured essential infrastructure to the seven schools in addition to October and Maadi. As per the extension requirements ESSP ordered 75 copies of each textbook for the seven new schools. October and Maadi had been operating with 50 copies only so far and ESSP added 25 copies to each textbook in each of these two schools. Fab Labs were also procured for the seven schools in two batches – an initial procurement of three Fab Labs followed by the additional four Fab Labs. Also, all the specifications of the material and equipment purchased by the project were transferred to the Ministry for their use. The Ministry used the same specifications adopted by the project to procure its own equipment and material for the four new schools.

Fab Labs have, this past year, been installed in the seven additional schools. The experience gained in the first two schools culminated in producing two young Egyptian experts in Fab Lab operation who accumulated substantial experience in Fab Lab operations as a result of their work with the first two schools. The Ministry took the initiative this past summer to assign a Fab Lab manager to each of the nine schools. An international Fab Lab consultant, assisted by the two local Fab Lab experts, provided training in country to the new Fab Lab managers assigned by the Ministry. The two Egyptian experts finished the installation of three Fab Labs by themselves followed by a visit of a US Fab Lab consultant who provided training and inspected the installation giving important tips to the two experts. The additional four Fab Labs that arrived later were installed by one of the two Egyptian experts assisted by three of the new Fab Lab manager assigned by the Ministry.

1. Summary of Quarter activities

This Quarterly Progress Report (QPR) details activities and accomplishments of the USAID – funded Egypt STEM School Project (ESSP), from July 1 to September 30, 2016. The report discusses work undertaken by World Learning working collaboratively with its partners (21PSTEM, TIES, MSI and TFI) in close cooperation with the Ministry of Education and its affiliates.

• **USAID Visit -** On September 7, 2016 Ms. Marie Longie, USAID's Deputy Administrator for the Middle East, visited the Maadi School. The visit was accompanied by Ms.

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Katie Donohoe, Director, Office of Education and Training, Ms. Sarah Banashek, Basic Education Team Leader, and Hala ElSerafy, ESSP AOR. Students led the visitors through the school starting with a visit to the Fab Lab. Practical lab training was taking place at the time of the visit; the training focused on providing all STEM teachers with the opportunity to practice implementing all lab experiments in the curriculum. The USAID delegation held conversations with the teachers. The visit ended with a presentation from the students about their capstone projects and a discussion, over lunch, with USAID personnel around students' aspirations after graduation.

- *Teacher Selection -* During this quarter ESSP supported PAT and the counselors of Math and Science to manage the teacher hiring process. The teacher application website was completely moved to PAT servers, and was managed by PAT staff. They processed the application data, automated the online English tests and coordinated with the counselor of English to assign supervisors to score the tests. PAT also managed the administration of the concept inventory tests at PAT headquarters in all its stages starting with identifying the candidates according to their English test scores, inviting the candidates to take the tests and coordinating with the counselors to provide the tests and score them. Tests were administered professionally using proctors selected by the counselors of English, Science and Mathematics. English, Science and Mathematics counselors scored the test papers and identified the successful candidates for training. Over 2,600 candidates applied online in all specialization and a total of 555 teachers went through various stages of the testing process over four rounds of testing. PAT has internally reviewed the teacher recruitment process and is preparing recommendations for improving the process in the future.

- *Training of Trainers (TOT) -* During this quarter ESSP collaborated with PAT to announce criteria for preparing ToTs for STEM. PAT published the criteria on its websites and opened an application process for candidates. 107 applicants applied to one of STEM areas (Pedagogy, Curriculum, Curriculum practical, Assessment, English and Capstone). A ToT workshop was conducted in pedagogy, developing and novice teacher materials and presentations. Another event was conducted in assessment including formative assessment and the PARLO philosophy, writing high quality assessment items, and instruction and assessment using high levels of cognitive demand.

- *Summer PDI –* The PDI this year was characterized by even more variation among groups of teachers. All current and potential teachers received training. Teachers were divided according to the training they received before. *Group one; the teachers who did not receive any training*, received four weeks of training including the beginning teacher package in two weeks, and lab practical and curriculum deep dive in two weeks. *Group two are the teachers who spent one academic year* at STEM schools and have previously successfully completed the beginning teacher training package; they received the lab practical and curriculum deep dive in addition to the experienced teachers training package. *Group three are the experienced teachers who spent more than one* year in the STEM schools; have received the lab training and curriculum deep dive. A total of 254 teachers received an average of 8 weeks of training during the PDI.

The PDI also included training for current and potential **school leaders**. Current leaders training focused on developing action plans for the new academic year using input from the principals and deputies and the findings from the asset mapping activities. Leadership training also included giving feedback on the principals' and deputies' use of the COS based on actual forms from the previous academic year and using web applications for managing workflow. Potential school leaders received the introductory leadership training which focused on the STEM model, observation, and preparing an entry plan. On August 8, 2016, the Minister visited ESSP's training venue and met with all groups. The Minister had an open discussion with the school leaders and listened to their suggestions and ideas. The Minster's visit was greatly appreciated by the participants who felt they are valued by the Ministry for their efforts in the success of STEM Schools. **Annex I** is the complete summer PDI schedule.

- *English Curriculum Development –* This quarter, ESSP held a workshop to review the STEM English curriculum. The workshop involved teachers from STEM in reflecting on their application of the English curriculum in the past year to revise the English language curriculum to better addresses the needs of STEM school students. Facilitated by a team of international and local experts, all teachers with one or more years of experience teaching in STEM schools were

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involved in the workshop. In addition to refining the STEM English curriculum, participants have increased their capacity to design courses that meet student needs. To ensure sustainability and capacity of MoE to follow-up on English curriculum enhancements, MoE supervisors and trainers participated collaboratively with the teachers in the workshop. Another more advanced Methodology workshop was delivered to involve teachers in planning and implementing lessons that align with the new scope and sequence. By the end of the training, STEM schools had a more advanced English language curriculum, with a scope and sequence that provides teachers with the tools they need to structure student learning.

- ***Teaching English Language Learners in Content Classes (TELIC) –*** During this quarter, ESSP held refresher training to 9 MoE trainers to prepare them to effectively deliver the course to STEM content teachers. The refresher enhanced trainers' knowledge of the course structure, guiding principles and content. It also provided an opportunity to enhance their skills in implementing the program scheduled during the PDI summer. By the end of the refresher training, the MoE trainers were oriented to the TELIC training manual. They also demonstrated the ability to deliver the program to teachers through practical activities in which they planned and delivered the events from TELIC program.

ESSP supported MoE trainers who received the refresher TELIC training to deliver the program to all the STEM teachers who did not receive it before as part of the STEM summer PDI, which was a total of 44 STEM content teachers from 8 STEM schools. The TELIC training was characterized by practical application by teachers and mini-language enhancement events. Trainers also guided teachers to apply their knowledge and skills acquired during the training in preparing lesson plans and conducting micro-teaching with their peers, and engaged in discussions and feedback on their demos. The second phase (implementation or follow-up) will last approximately three months during which time participants apply what they learned in their classrooms, supported by classroom observation and feedback, and on-line conferencing and coaching.

- ***Summer Camp –*** ESSP held two consecutive workshops for MoE trainers and STEM school English Teachers on delivering the English and Leadership Summer Camp updated. The Summer Camp serves as an introductory English course for the new cohort of the STEM Grade 1 students and aims to provide them with the skills needed to for learning English in particular and learning in general in a STEM school. The course adopts a communicative approach that engages the learners in using the English to achieve academic, STEM, and real-world tasks. Through the English and Leadership events, the students are exposed to authentic material and opportunities to draw on and learn from the STEM School environment. The course is a reliable academic starting point to induct the new student to the STEM school Academic Life.

- ***Documentation in Support of STEM Department*** – ESSP Project presented the Design Blueprint tool, the New School Startup Manual and the Master Checklist to USAID and later demonstrated the tool and documents to USAID. The Blueprint, New School Manual and Master Checklist will be taught by TIES to the STEM Unit in a STEM Unit meeting in October 5, 2016. USAID expressed interest in making the Design Blueprint a required tool in the management and startup of these schools. USAID is also very interested in ensuring that all relevant documents across all key areas of the schools are included so this tool can be part of a system of management tools and policies.

- ***Summer Practical Camp*** - STEM schools in Kafr El Sheikh, Red Sea, Luxor and Ismalia did not get all the necessary laboratory supplies last year because it took the Ministry a longer time than expected to procure, for the first time, all the necessary goods for four schools at once. Teachers were, therefore, not able to conduct laboratories for practical work and the students missed out on the development of critical laboratory skills and the development and application of key concepts in their subjects through laboratory investigations. Because the practical component of the curriculum is such a unique and essential feature of the STEM curriculum, ESSP conducted a two-week summer practical camp for the students from these schools. In order to prepare for the camp and provide essential practical refresher training for the teachers, the project first had the teachers come to Cairo for an intense one-week training and planning for the practical camp. This training was planned and supervised by a US consultant and one of the STEM Unit members. The training was conducted by experienced teachers and STEM Unit members who are trained as ToT Practical candidates. Following this training, the teachers conducted the summer practical camps in their schools for their students under the supervision of STEM Unit members and local supervisors.

- ***Training*** – During this quarter, ESSP implemented 25 training events, the following table deterimned these events;

#	Course	Date	M	F	Total No. Of Trainees	No. of Days	Event Hours
1	URT Analysis	7/10/2016	7		7	5	30
2	Preparation for Summer PDI	7/24/2016	3	7	10	5	30
3	STEM Curriculum Review	7/31/2016	70	20	90	5	30
4	English Teachers Curriculum Training W1	7/31/2016	16	12	28	5	30
5	Leadership Training	7/31/2016	10	3	13	5	25
6	Leadership Training	8/7/2016	9	2	11	5	30
7	English Teachers Curriculum Training W2	8/7/2016	18	11	29	5	30
8	Developing Teachers Training (STEM)	8/7/2016	69	18	87	5	30
9	New Teachers Training Group A-W1	8/14/2016	22	9	31	5	30
10	Summer Camp refresher (TOT)	8/14/2016	8	8	16	3	18
11	New Teachers Training Group A-W2	8/21/2016	20	8	28	5	30
12	Beginning Leadership Training	8/21/2016	19	4	23	5	30
13	TOTs TELIC Refresher	8/21/2016	4	5	9	4	24
14	New Teachers Training Group B-W1	8/28/2016	29	15	44	5	30
15	New Teachers Training Group A-Practical	8/28/2016	27	9	36	5	30
16	TELIC Training	8/28/2016	39	12	51	5	30
17	English Teachers Curriculum Training W3	8/28/2016	13	7	20	5	30
18	Assessment Training (TOT)	8/28/2016	6	1	7	4	24
19	New Teachers Training Group B-W2	9/4/2016	27	16	43	5	30
20	Assessment Training For Local Supervisors	9/4/2016	26	11	37	5	30
21	Developing Teachers Training (STEM)	9/4/2016	42	8	50	5	30
22	Fab Lab Training	9/4/2016	7	2	9	5	30
23	PARLO Training	9/4/2016	5	4	9	4	24
24	New Teachers Training Group B-Practical	9/18/2016	10	5	15	5	30
25	New Teachers Training Group C	9/18/2016	16	6	22	5	30

During Summer PDI the total number of trainees were 254 (192 M, 62 F) teachers and 67 (44 M, 23F) MoE staff. These numbers reflect those trainees that participated in 16+ hour trainings.

During last project year, ESSP trained 523 STEM school and MoE staff (176 male, 147 female). These numbers reflect those trainees that participated in 16+ hour trainings.
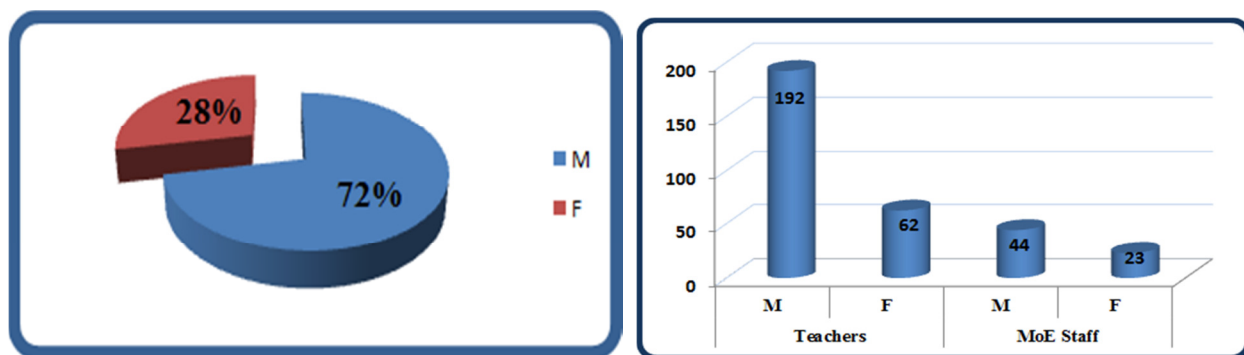
2. Activities leading towards accomplishment of Program objectives

2.1   Project Management

ESSP was awarded a one year extension after negotiations with USAID, signed on July 28th extending the project through August 27th, 2017. The project, including field staff, home office staff and partners, worked closely with USAID over a period of about eight months to develop the program description of extension year activities that would focus on the sustainability of the STEM schools and MoE capacity building.

Major advancements were made in the reporting period in English language. Key activities include the development of the English language curriculum in collaboration with the STEM schools English language teachers and under the supervision and active participation of the English counselor and the integration of the English language learning outcomes with the STEM curriculum learning outcomes, which required additional time, and were concluded this quarter. The production of the preparatory outreach eSTEM Online units on an interactive CD, the launch of the eSTEM online for grades 10 and 11 in all schools, and the delivery of the additional English language resources/books in all schools were a boon to the English language activities.

The further development of the PDI and its first summer deployment to nine schools faced challenges due to the large number of schools and the possibilities to fulfill such needs by qualified teachers in all branches of STEM and humanities. The visit of the Minister to our PDI this past quarter gave the attendees and the project great support as it showed the clear backing of the Ministry at its highest levels.

The audit that took place and culminated during the past quarter required an extra level of effort and coordination between World Learning and its partners and between the field and the home office.

A major push on the Blueprint was also exerted to finalize the organization of the Blueprint and include most of the project documents into a well-mapped dashboard that facilitates its use and access to documents. This was complemented by a series of workshops with the STEM Unit that introduced the Blueprint and trained the members on using it.

Another push, this past quarter, was exerted in the preparatory outreach. Meetings were held with the Science and Math counselors and an effort was made to lock in Boeing's Curiosity Machine as a potential partner to support STEM's outreach efforts.

These efforts will better position ESSP for its extension as the project has already started on activities scheduled for the extension and will build upon its progress during the coming two quarters.

2.2   Project Activities

This section summarizes key accomplishments against the AIP for each objective area. All project activities are part of a larger iterative process and many aspects of individual activities overlap with other activities. The AIP covering the period of extension and last quarter of this year is still being reviewed by USAID; however it is more relevant to report our activities according to this AIP in anticipation of its approval.

Objective 1: Increase student interest, participation, and achievement in science and mathematics with special effort to underrepresented groups such as girls and economically marginalized students.

To *develop extracurricular activity in Science and Mathematics for preparatory Schools (Activity 1.2)*, during this quarter, ESSP held a meeting with the Counselor of Science and with USAID present in which the draft science club material was presented and shared. The Counselor suggested using the science club material as part of the Science curriculum for grade one and as an optional activity for grade two and three, but needed to review the material in detail to reach a final decision. ESSP held a second meeting with the counselor in which he presented his comments on the science club material to make it more linked to the Science curriculum. This represented a change of direction as the main goal of the activity is to enhance students' scientific thinking skills and was not meant as part of the Science curriculum. The Counselor suggested sharing the material with the head of the CCIMD to further explore the idea of making it part of the Science curriculum. The DCOP held a meeting with the CCIMD Director and Counselor of Science and agreed to form a team from CCIMD and the Counselor's office to

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review the material for relevance. The team wrote a detailed report classifying the activities according to preparatory grade 1, 2, or 3. The team also suggested a scope and sequence for the activities. Once the scope and sequence is drafted, a workshop will be held including the Counselor of Science's office, CCIMD, and the team of MoE trainers who developed the activities to make final changes and edits in preparation for piloting the activities in grade 1 and training trainers from all governorates in preparation for general implementation during the second term of the 2016/2017 academic year.

In order to *develop extracurricular activity for English in Preparatory Schools (Activity 1.3),* ESSP started the e-STEM Interactive Compact Disk (CD) development process by initiating official bidding procedures to solicit proposals from respondent vendors. The interested vendors were provided with an overview of the main concept and rationale, and proposed information regarding the assigned task, technical specifications, and terms and conditions.

Tenderers were provided with the documents needed for developing the sample work. Each submitted sample work was evaluated based on standardized technical criteria. The technical team's recommendation was for ANOVA, who received the highest score. The assigned vendor was contracted to start developing 10 units and the assigned delivery time is October. The vendor has delivered 6 developed units for review and feedback. The reviewing committee has finalized general feedback for all units as well as detailed one for each section in each unit. The feedback has been shared with the vendor. The listed notes were requested to be considered for editing the developed units and developing the final 4 units for the final delivery in October.

To *Support the establishment of BoTs in STEM Schools (Activity 1.4),* the work continued to leverage the support of the Boards of Trustees (BOTs). The traditional BOT in Egypt is very good at solving problems for the schools. The shift in BOT roles and responsibilities for Egypt's STEM Schools is the addition of creating opportunities for students that are aligned with the school's missions. For example, in addition to finding funds for printers and buses to university labs to address the delay in equipping and furnishing science labs, the BOTs will leverage partners that contribute to these needs and others to expose students to careers and career pathways through visits by STEM professionals and to STEM-related facilities. To this end, the BOTs received training in these responsibilities (in the previous quarter) and each has completed an Asset Map. Their Asset Map includes people, organizations, facilities and other resources that the schools can leverage through partnerships to provide opportunities for the school. During PDI in August, an exercise was included in the School Improvement Planning portion of the training. Under the heading of community engagement, the principals and deputies used the Asset Maps created by their BOT to generate an action plan. This action plan lists the organization, people, facilities or events and the next step that should be taken by the school leader or the BOT to engage them. The principals will review these plans with the BOTs as their school year begins and work together to create opportunities. This process of leveraging local resources in a different manner at each school is part of school specialization. School specialization maintains the quality and fidelity of the shared Egypt STEM school model while creating a localized identity and a sense of pride in their school. This

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process also creates a sense of community belonging and ownership in the school. Such community involvement and support will improve the sustainability of all the schools.

During school visits to Gharbia and Ismailia, the topic of engaging the local STEM Unit and/or the local Ministry authorities was discussed. In the case of Gharbia it was in the form of coaching the school leadership on effective ways to engage these organizations to gain support. In Ismailia, where the engagement of the local STEM Committee is more obvious by their presence during this visit and our visit during the spring Capstone exhibitions, the discussion was a check to see if the principal was content with the relationships that have been created. The sense of pride shown by the two supervisors regarding this school was evident during our visit.

Objective 2: Strengthen the STEM School local initiative through developing an effective model of specialized high schools focusing on science, technology, and mathematics for gifted students.

To Support the specialization of STEM schools (Activity 2.1), during this quarter the Asset Maps from each STEM school BOT were collected and shared with the principals and academic deputies during the August PDI events for Leadership. The participants used their own school Asset Map results to develop a draft School Improvement Plan. The goal was to determine actions that can be pursued by the school to engage the assets (people, places, and activities) that will help the school to achieve its goals. The plans include school specialization through actions that are designed to impact school specialization. These actions will lead to supplemental-curricular activities, visits to facilities, partnerships with organizations, external experts for Capstones and others that will be unique to their school. The school leaders then incorporated the results of this exercise into a larger exercise to develop an overall school improvement plan. ESSP will continue to provide additional support and connections to universities and information about education providers in each location. A sample action plan based on the BOT Asset Map and excerpted from the School Improvement plans created during Leadership PDI events.

Cooperation Type	Partner
Get donations from them- facilities to be built around the school-	Suez canal authority
Donations and fieldtrips	Industrial zone in Ismailia Electric power
Factories and workshops	Arab constructing company
Workshops that we can use	The technology school in Ismailia
Field trips	Army factories in Ismailia
Professors supervise the project of students,	Suez Canal, Zwiel, Ain Shams, Cairo, Nile, AUC, Helwan, Sinai and Arish universities

Next quarter, as the school year starts, the principals will share their draft Action Plan with the BOT to get feedback and inputs. Together, the principal and the BOT will work

together to implement the plan. The ESSP team will connect with each principal and BOT on a monthly basis to check progress.

To *Support the establishment of four new STEM schools (Activity 2.2),* ESSP continued to provide textbooks and equipment to the new STEM Schools. By mid-September, the project received and distributed 375 biology textbooks for grade 1 in the 7 schools to raise the number to 75 textbooks per grade. Moreover, the project distributed 9038 math connections textbooks for 9 schools according to the following table:

Summary	Alex	k. Elsheikh	Dakahlia	Luxor	Assiut	Ismailia	Red Sea	Maadi	October
Math connection MC1 a	175	175	175	204	205	175	200	66	66
Math connection MC1 b	175	175	175	204	205	175	200	66	66
Math connection MC2 a	185	183	183	200	200	183	195	90	90
Math connection MC2 b	185	185	185	205	205	185	197	105	105
Math connection MC3 a	185	185	185	200	200	185	195	105	105
Math connection MC3 b	185	185	185	200	200	185	195	105	105
Totals	**1090**	**1088**	**1088**	**1213**	**1215**	**1088**	**1182**	**537**	**537**

In addition, the project procured 2809 Math Connections teacher edition textbooks and Science student and teacher edition textbooks for the 9 schools. These textbooks will be distributed in early October. Additionally, 300 chemistry textbooks for grade 3 were procured and will be distributed to the 4 STEM schools. English textbooks for grade 2 and grade 3 for 7 schools were also procured and will be distributed in October. Moreover, purchase orders for grade 2 and grade 3 statistics textbooks issued for the 9 schools.

To operate the Fab Labs in Luxor, Kafr Elsheikh, Red Sea and Ismailia, the project procured and delivered Fab lab furniture and installed the Fab Lab equipment. To facilitate the Fab Lab operations in 9 schools, the project procured electronic equipment, including resistors, lamps, and materials, that will be distributed by October.

During this quarter upon approval of the cost extension, ESSP procured 720 laptops for grade 1 students. Alexandria, Daqahlia and Assuit received the laptops according to the number of students at each school, and Maadi and October will receive the laptops in early October. As mentioned before, the development of interactive CDs for the English e-STEM website was awarded and contracted to a vendor, and is scheduled to be delivered by end of October. Finally the project procured the requested stationary for the first semester for the 9 schools.

The MoE hired new Fab managers in Maadi and October. Both demonstrate engineering and education experience and a strong desire to create more opportunities with these Fab Labs. The previous October and Maadi managers, under contract with ESSP, will provide support to the Fab Lab group. A weekly call was set up for all Fab Managers to be led by the Fab Network Leadership and the ESSP team. The new Fab managers for Maadi and 6th October received introductory training to STEM by the former Maadi Fab Manager. US consultants visited the Fab Labs during this time and it became clear that additional on-the-ground support was needed. The project is revising the training plan for on-going support utilizing in-the-field capacity from leading Fab Lab managers to conduct greater training and support.

Fab Lab installations in Luxor, Ismailia, Red Sea and Kafr Elsheikh were finalized over the summer. Additional training was provided to Fab Lab managers during summer PDI. US consultant led the training among the current group of Fab managers from various schools in the Egypt STEM schools network at 6th of October School from September 4-9, 2016. A discussion was initiated with the managers about the future of the Egypt Fab Lab network and to clarify how the role of the Fab Lab manager fits into the network, clarifying expectations and support. Managers were motivated and willing to fulfill their roles. During the dialogue, they also identified several missing materials in the lab. ESSP has been charged to compile a complete list of missing materials in each of the schools. The required items were procured and will be distributed early October.

After the initial dialogue and confirmation of expectations, the consultant moved through the prepared training outline customized for the week, starting with the basic aspects of Fab Lab to assure alignment and normalization among the managers. In general, the training was conducted as planned, but due to multiple power outages at October, the training moved to the Maadi Fab Lab. The trainees requested additional on-going support.

The two new schools, Menofia and Gharbia, do not as yet have Fab Labs. All other Fab Labs are functioning, but will need continued support in the next quarter to become fully operational. In the next quarter, the ESSP support team will establish weekly conference calls for this network of Fab Managers.

Objective 3: Build the capacity of highly qualified cadre of STEM professionals and provide opportunities for training and sustained, intellectually rigorous professional learning.

To build the capacity of a cohort of STEM Trainers (Activity 3.1), additional trainers were identified and a process was created allowing interested and qualified candidates to register with PAT. Gaps in trainer needs (including lack of trainers in

certain governorates or topic areas) were identified and recruitment and capacity building will focus on these areas in the coming quarter. ToT candidates received training prior to the start of the PDI and this included a reminder of the certification process that has been proposed to PAT. In the next quarter, this process should be approved and a training expected in October should provide this information to ToT candidates. TOT Candidates were trained on developing and novice teacher materials and presentations. Candidates were STEM Unit members and teachers. Implemented revisions suggested by the candidates and much of the organization of the events were assigned to STEM Unit members so they could have practice implementing training by themselves. Every topic area presented during the Summer PDI provided ToT candidates with the opportunity to facilitate or co-facilitate events with supervision and feedback from US consultants and Central STEM Unit members. See Annex I, PDI schedule for more information about the numbers of ToT candidates who participated. Additionally, the Assessment Team trained seven (7) TOT candidates across four days using Beginning and Developing Teacher manuals during the summer 2016.

During their two weeks of workshops, school leaders learned how to create action plans that included specific goals, tasks, appropriate audience and partners and measurable criteria for success. The culmination of this work was a day of presentations to the Central STEM Committee Chairman and to the regional managers. These plans are being monitored via visits from BOTs, the STEM Unit, regional managers, and weekly calls with other school leaders.

School Improvement Plans are ideally created using student achievement data from the previous year and contained Mission and Vision, Staff Evaluation Plans (Classroom Observations Scale and Feedback Cycle), Community Engagement Plan, Supplemental Curriculum Activities, Strategic Communication Plan (Strategic Relationship), and Capstone.

School Improvement Plans were formulated by asking the following four critical questions:

- Reflect on what worked and what needs to be revised.
- How will you revise the plan?
- How will you implement it?
- How will you measure it?

During one day of the training, the principals and deputies focused on the School Improvement Plans with an emphasis on the capstone process, which can be engaged to enable specialization and connectivity to the community.

To Provide Training to New and Existing STEM teachers (Activity 3.2), beginning teachers in groups A, B and C received full set of certified STEM training using local trainers with co-facilitation of US experts. The four weeks of training including the beginning teacher package in two weeks,

and lab practical and curriculum deep dive in two weeks. Developing teachers who spent one academic year at STEM schools and have previously successfully completed the beginning teacher training package received the lab practical and curriculum deep dive in addition to the experienced teachers training package. The experienced teachers who spent more than one year in the STEM schools received training on advanced content and coaching as designed in manuals.

The Summer PDI trainings were conducted on the assessment side with a focus on formative assessment. One of training goals was to link the formative assessment piece to the previous curriculum training events in order to provide continuity and perspective for the teachers. More time was spent with the beginning teachers in order to prepare them for using a new assessment system that is different from the previous Thanaweya Amma system that focuses on memorizing facts rather than using critical thinking skills. A second feature of the introduction to the assessment training was to compare classroom instruction to personalized learning and the advantages of both systems. Teachers were trained on creating levels of questions that enhance student learning and allow for formative assessment. Emphasis was placed on using a Student Question Protocol as a tool to improve the questions that students ask. A variety of assessments were employed to provide evidence of learning toward a Learning Outcome (LO). Another aspect of the training was to explain and apply the PARLO philosophy in the areas of assessment and instruction. Teachers were also trained on a variety of techniques to address misconceptions in their content area. During the events, teachers at each grade level, came to agreement on certain key concepts and LOs. They also did some minor reordering of the Learning Outcome sequences based on feedback from the previous curricular year. In terms of assessment, teachers and principals were surveyed regarding their familiarity of PARLO. In conjunction with PARLO, time was spent on the concept of thinking at depth and the reasoning that is used to develop the PARLO philosophy. Teachers were challenged to design an assessment plan for a learning outcome of their choosing with a variety of evidences of learning.

A procedure was developed and TDC was trained on creating Leadership Training Schools that allow school leadership teams to practice loading data into their own training schools so they could safely update a school without impacting any production schools. These Leadership Training Schools can also be used to assess a team's capabilities in using Tracker. Computer teachers and school administrators were trained in Tracker with the intent that they would train new staff within their school. A representative from the TDC and the STEM Unit Task Force also attended this training to get initial exposer to the Tracker system.

In order to *Measure the improvement of STEM Teacher performance (Activity 3.3),* ESSP is planning to collect data for a second round in the beginning of the second term during this academic year.

Objective 4: Strengthen MoE capacity at the systems and policy level to sustain and replicate these model schools.

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During this quarter, ESSP continued to provide technical support to PAT and the Central STEM Unit in the teacher hiring process. This year, PAT has demonstrated the ability to sustain the teacher hiring process through the establishment and continuous improvement of the online application platform, the administration of online and face to face screening tests, and the invitation and issuance of release letters to participants. ESSP is planning to hold a workshop with PAT, STEM Unit leadership, and the Counselors to review the STEM teacher and leadership hiring process, identify successes and lessons learned, and propose and adopt steps for improvement of the system for next year.

To Support the establishment of STEM trainer, administrator, and teacher certification system (Activity 4.1), the certification process is currently in progress with PAT. Trainer competencies were also submitted to PAT and are awaiting approval. Also, STEM professional development processes and procedures have been shared with PAT and a liaison has been put in place to assist with the transfer and support of these processes. Training materials have previously been certified by PAT, with additional materials expected to be submitted in October.

ESSP project added to and revised manuals and related materials for use in the summer PDI to facilitate teachers' understanding of formative assessment and related assessment concepts and skills. The updating process started with the beginning teacher manual for formative assessment and the PARLO philosophy, followed by the development of the PDI materials and manuals for the developing teacher events. Training manuals and materials were also developed for the leadership PDI which reinforced the concepts and skills taught to teachers so that school leaders would be able to supervise and provide feedback to teachers following classroom observations. Plans were prepared for instruction for TOTs on these concepts and skills and in how to lead these PDI events. Tracker ToT Manuals were separated from the assessment manuals and updated. The TOT PDI events allowed for extensive feedback and ideas for revisions by the TOTs. Relevant suggestions and revisions will be incorporated in the next versions of the PDI manuals and training materials.

To Support the development of an Assessment System for STEM schools (Activity 4.2), a series of trainings to governorate supervisors and members of the MoE were delivered as a part of the Summer PDI. The US consultants focused on training in concepts and practices of formative assessment and varying cognitive demand were conducted for Ministry of Education for teacher trainers, and for governorate supervisors.

The ESSP Assessment Team has continued to work closely with the STEM Unit and the Mathematics and Science Counselors' offices to offer planning, development, and analytical assistance for the Grade 1 and 2 exams (i.e., practical and multiple choice mid-term and end-of-semester exams).

One issue that has been in need of resolution is the guidance provided in the Semester Exam Framework developed by Assessment Team, adopted by the STEM Unit, and used by the Mathematics and Science Counselors' offices to inform semester exam development and the number of items at each cognitive level for each LO. A US consultant investigated the issue of

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how many selected-response assessment items need to be created per LO in order to be sufficient to develop a PARLO score that reflects the levels of proficient and high performing. The consultant initially examined the actual number of items per Learning Outcome on the spring 2015 (semester 2, 2014/2015 school year) finals and the fall 2015 (semester 1, 2015/16 school year) midterms. On the most recent midterm for which the project has data, the number of Learning Outcomes per test ranged from 1 to 4, and the number of items per Learning Outcome ranged from 8 to 12. On the most recent semester final for which the project has data, the number of Learning Outcomes per test ranged from 4 to 10, and the number of items per Learning Outcome ranged from 2 to 20

The Assessment Master Plan was updated to address the project's assessment needs for the final year. Training tasks planned for Year 5 in the Assessment Master Plan that align with the most recent iteration of the extension AIP include coordinating winter break PDI events in assessment for teachers, school leaders, trainers and governorate supervisors, as well as revising relevant manuals for those training events. There are also a number of virtual training events for teachers and school leaders planned throughout the academic year in interpreting STEM assessment data and supporting teachers in interpreting assessments. Plans have been made to continue to train teachers and relevant building administrators on formative assessment and the use and philosophy of PARLO.

The ESSP Assessment Team plans to continue to train supervisors during the winter PDI and in other venues throughout the year on assessment item development and item analysis, validity, and reliability. The team will also be completing manuals based on these trainings. One of the major initiatives for Year 5 will be to conduct specialized training on the Test of Concepts (TOC) development for the STEM Unit members and supervisors in order to facilitate a transfer of the development of these yearly high stakes exams for grade 3 students. Integral to this task will be the creation of a TOC training manual.

The Test of Concepts is a part of the Grade 3 matrix for student placement at Egyptian universities. Please consult section 4.2.5 of this report that contains the Assessment Master Plan for the proposed activities relevant to the training of MoE test makers on how to develop a Test of Concepts for Year 5. Governorate supervisors participated in a week of item writing professional development with the ultimate goal that those who prove to be qualified may be able to participate in the development of item banks for the tests of concepts and the semester exams.

US consultants conducted a five-day workshop to train Egyptian STEM school supervisors on how to write, review, and tryout quality multiple-choice items for the grade 1 and 2 examinations and to use the PARLO tracker. Strategies included explaining characteristics of high quality multiple-choice items, reviewing Webb's Depth of Knowledge cognitive levels, introducing and demonstrating the use of an Item Development Form and an Item Writing Checklist. Supervisors wrote items, performed peer review of these items, and discussed possible ways to improve the items. The supervisors wrote a minimum of five items each and received feedback. Then the supervisors practiced reviewing, and practiced. At the end of the training, 90 percent of the supervisors remained to continue to write items at the higher cognitive

levels (levels 2 and 3) as well as performing independent reviews of additional items. This work will be assessed and feedback will be provided.

In the late spring of 2016, the ESSP Assessment Team received data from the Survey of Enacted Curriculum (SEC) training events for the governorate supervisors, which took place in April 2016. During this training, governorate supervisors participated in a series of exercises in which they engaged substantively with the challenge of thinking through how problems in each content area (math, physics, chemistry, life sciences, etc.) vary across factual, applied, and strategic cognitive demands. A critical part of this training was focused on having math and science content experts use the SEC instrument to align curriculum Learning Objectives (LO) to specific SEC content categories as well as determine the cognitive load for each of the LOs. The results of the governorate supervisors' SEC content analysis were forwarded to the Assessment Team.

One of the goals of ESSP Project is to help identify MoE math and science content experts to serve as item writers for summative assessments. The project proposed using the SEC as an instrument to assist in the selection of these item writers. The goal was to have a standard set of SEC LO coding based on the work of the experts in each of the five STEM content areas to be used to select future item writers. The Assessment Team identified three content experts each in the areas math, physics, chemistry, life sciences, and earth science and then developed a series of SEC training and coding events for these experts. US consultants trained the math and science content experts virtually in the use of the SEC in late July 2016. Following these training events, each of the five content expert teams met separately to complete the coding of the LOs in their specific content area. Then these team coding results for LO was analyzed and SEC content maps was produced for each subject. In addition, SEC coding work completed by Governorate Subject Supervisors from the spring was also processed.

During the fourth quarter, a workshop was held on July 10-14 to build the capacity of subject supervisors in psychometric analyses and interpretations of results using actual 2016 URT data. A total of seven subject supervisors, who have been heavily involved in the design and development of the URT, participated in the workshop. In the first phase of the workshop, the participants were provided with a conceptual understanding of the various item and test statistics (e.g., difficulty, discrimination, differential item functioning, option analysis, and test reliability), procedures of calculating those statistics, and their interpretations. In the second phase of the workshop, the participants were provided with hands-on training exercises to carry out psychometric analyses in Iteman, commercially available software. They practiced analyzing the data repeatedly (from creating input files to producing output files) to master the skill. Please find below the details of the workshop.

During the next implementation year, ESSP will carry out a number of activities for the standardization of the URT including an alignment study to examine the relationship between the URT specifications and the General Public School Curriculum (GPSC), and pilot testing of items to a sample of experimental schools before including them on the operational URTs in 2017. Moreover, we will continue building the capacity of the subject supervisors in item development, instrument assembly, and psychometric analysis and reporting.

US consultant trained the TDC on the new Curriculum Upload processes and the School Year rollover process.

To *Support the establishment of STEM Department (Activity 4.3),* ESSP project continued to construct the Egypt STEM school system tools for the STEM Department's use. Design around the development of the STEM Department will be discussed and planned with all partners.

The New Egypt STEM School Startup Manual, Master Checklist and Timeline, and the Egypt STEM Schools Blueprint were updated and continue to be updated. The New Egypt STEM School Startup Manual along with the Master Checklist and Timeline were designed for use by the Executive Committee. Used together, these tools ensure quality and fidelity with the Egypt STEM schools model. They include the processes, documents and suggested timelines to use User feedback is gathered and used to improve the materials and site.

Egypt STEM School Blueprint | Success Indicators | New School Master Checklist | Tools and Documentation | Sitemap

Egypt STEM Schools: The Promise for Egypt

In looking towards our future, Egypt STEM Schools were established to ensure Egypt will have a fully engaged citizenry of inquisitive and determined young men and women well qualified to respond to the **Grand Challenges** facing our nation and our world

- Improve the use of alternative energies
- Recycle garbage and waste for economic and environmental purposes
- Deal with urban congestion and its consequences
- Work to eradicate public health issues/disease
- Increase the industrial and agricultural bases of Egypt
- Address and reduce pollution fouling our air, water and soil
- Improve uses of arid areas
- Manage and increase the sources of clean water
- Deal with population growth and its consequences
- Improve the scientific and technological environment for all
- Reduce and adapt to the effect of climatic change

Blueprint Website

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The Design Blueprint tool, the New School Startup Manual and the Master Checklist were presented and later demonstrated with the tool and documents to USAID. The Blueprint, New School Manual and Master Checklist will be presented during STEM Unit Meeting on October 5, 2016.

In addition to the overall school startup documents, feedback from STEM Unit members, Capstone evaluators, teachers and students was used to improve Capstone documents and to create new documents. The August PDI training presentations for teachers were updated to include training on the Capstone App. Other document updates for PDI include a revised Capstone Exhibition Rubric and a more comprehensive Capstone Teacher Workbook that can be used by teachers at all grades for each semester. New Capstone Challenges were designed for the school year, which incorporated recommendations from the STEM Unit.

New documents include a Student and Parent Handbook – Capstone Appendix used to inform students and parents of rules and practices specific to Capstones along with rules that apply to all STEM School subjects, such as Academic Honesty. The Appendix also includes some of the forms for student use.

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New training documents were created to support Capstone Leadership Training, designed for use with academic deputies and Capstone leaders. A portion of this training focused on the academic deputies use of the Capstone App for Capstone Journal administration, monitoring and grading.

The Capstone App has been updated to make sure that it functions as designed. This

includes administration of Capstone Journals, preparation for scoring by teachers, assigning teachers to score anonymized student journals, monitoring teacher progress on journal scoring, and assuring unique student identifiers. In addition to these updates, other features have been added to support Capstone Journal Assessment. Some of the new features include: prompting Academic Deputies to indicate excused/unexcused absence for missing student data, sending teacher calibrated responses to teachers for use with scoring, and mail merge journal scoring results to the students.

The Capstone App training was added to the beginning teacher, developing teacher and capstone leadership trainings. Following the start of the school year, work will take place to bring Capstone Exhibition processes and documents into the Capstone App and to eliminate any need for transferring of scores or updating of scores by any individual.

Objective 5: Support the MoE in upgrading science and mathematics curriculum standards, students' assessment, and teacher preparation for the mainstream.

In efforts to Develop Curriculum standards (Activity 5.1), ESSP is developing the capacity of CCIMD staff through several workshops to design and conduct standards writing for an integrated curriculum. The STEM subject teams in these workshops are developing content standards and indicators. Additionally, they are integrating their standards among the disciplines through connections in the Grand Challenges. In the previous quarter CCIMD staff started to map the current learning outcomes to both Egyptian and US standards and completed the mapping process. Dissemination of the standards is premature however; the complete comprehensive document for all STEM subjects is now under final revision process.

An evidence to the progress done though these workshops, the CCIMD director and his staff have started the standards for writing process for the activities and humanities in the STEM schools. During next quarter they will start the integration process between all humanities subjects.

Capstone standards were written based on researched standards and linked to the Capstone Learning Outcomes. The standards are called the Capstone-Engineering Standards and Indicators. The Fab Lab Learning Outcomes have been updated. The writing of the Fab Lab standards is underway.

To *Support CCIMD contextualize STEM Curricula (Activity 5.2)*, in one of the events with CCIMD standards teams, training were conducted on contextualization. At this point, the main vehicle for contextualization of the standards is through integration with the Egyptian Grand Challenges. However, during the reviewing process of the standards, ESSP will focus on, among other things, other opportunities for contextualization that may have been missed by the writing teams. Contextualization is an on-going process.

3. Challenges and Resolutions.

The Central STEM unit played an instrumental role since its formation in carrying out a number of key STEM tasks including capstone management, training, assessment, and school follow up. However, the change of its members posed a challenge to the sustainability of its work. The unit has a number of extremely qualified STEM experts who can help sustain the model if used within a stable structure that allows for continuity of their efforts. There is a need for a process to ensure the transfer and sustainability of the STEM model as part of the MoE structure and in coordination with PAT, NCEEE, CCIMD, and other relevant entities. ESSP is currently coordinating with the Executive Committee to form a transition team including qualified experts who were part of the creation of the STEM model and representatives of the key relevant entities. Once formed, the team will be tasked with the documentation of all aspects of the model, and the proposal of a strategy to sustain it within the Egyptian context. The transition team's responsibilities will also include suggesting a set of activities that are needed to ensure the completion of the Egyptian STEM school design.

Although the number of teachers applying to work in STEM schools has increased over the past years, the population of applicants did not include an adequate number of the most needed specializations or the required caliber of teachers. The expansion of STEM schools from 2 to 9 to 11 also increased the severity of this challenge. The rapid expansion increased the burden on training to help teachers reach the essential skills and knowledge needed to work in a STEM school. It also led, sometime, to direct hiring of teachers through the counselors' offices to fill the gaps after the beginning of the school years. ESSP always provided emergency training to these teaches through site and virtual coaching in addition to including them in the PDI at the Mi-year and the summer. ESSP also coordinated with PAT and MoE to spread the announcement of STEM schools and the need for teachers using various methods including the websites, the social network groups, and involving the local supervisors to encourage potential good caliber teachers to apply.

Since its start the project has been expending on the operation costs of the schools. This includes consumables for laboratories such as chemicals, glassware, as well as the administrative items such as toners, copying paper, other stationary. ESSP has also been supporting the purchasing of raw material for capstones and the Fab Labs. It is understandable that because the schools do not have any sources of revenue, the project needs to expend on such items to keep the schools running, the exams administered, the students' projects and learning progressing until the Ministry is able to take over this responsibility. To support the transition, ESSP has requested to work with the Ministry so that a system is in place for the Ministry to be able to fully provide these necessary supplies without interruption by the second semester of the 2015/2016 school year but this never materialized. ESSP will work with the Executive Committee so that the Ministry is able to fully take over this responsibility for all school as soon as possible.

Annex I: PDI Schedule

Annex II: ELP Report

Annex III: Training Events

Annex IV: Meetings Minutes

Annex V: Project Geographic Locations