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## Education Consortium for the Advancement of STEM in Egypt (ECASE)

### QUARTERLY PROGRESS REPORT APRIL - JUNE 2016



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## **Education Consortium for the Advancement of STEM in Egypt (ECASE)**

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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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## Acronyms

21PSTEM	The 21 <sup>st</sup> Century Partnership for STEM Education
ACT	American College Testing (exam)
AIP	Annual Implementation Plan
BOT	Board of Trustees (school)
CA	Cooperative Agreement
CDRS	Curriculum Design Review Studio
CMS	Content Management System
COP	Chief of Party
DEC	Department of Educational Computing
DCOP	Deputy Chief of Party
ECASE	Education Consortium for the Advancement of STEM in Egypt (USAID)
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
PARLO	Proficiency-based Assessment and Reassessment of Learning Outcomes
PAT	Professional Academy of Teachers (MOE)
PD	Professional Development
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, 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

## 1. Summary of activities

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

- **Students Achievements**

1. **Intel ISEF 2016 Grand Award winners** - Ten STEM students from USAID-supported October and Maadi schools joined Egypt's delegation at ISEF 2016, which comprised of 17 students from all over the country. STEM school students constituted almost 60% of the delegation and were the only ones to achieve awards. Intel presents Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant is given to their school and the Intel ISEF Affiliated Fair they represent. Samah Ayman Hamdy, 17, and Maria Hany Hanna Shehata, 18, from Maadi STEM School for Girls in Cairo, Egypt won the 4<sup>th</sup> place for their project “Superconductive Hybrid Desalination” in the Earth and Environmental



Sciences category. Also, Haya Ahmed Mohamed, 16, and Madouna Attalla, 17, from Maadi STEM School for Girls, in Cairo, Egypt won 4<sup>th</sup> place for their project “Desalination by Pervaporation System” in the Environmental Engineering category. Madouna and Haya also won the USAID Global Development Innovation award and Sigma Xi, the Scientific Research Society award.

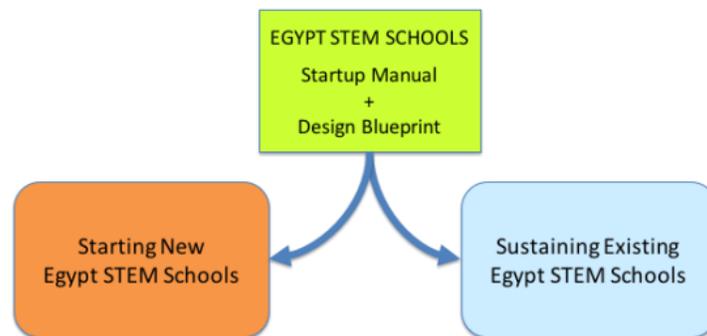
2. **ISWEEP** - For the second year in a row, two student teams from the Maadi STEM School won ISWEEP international competitions: Heba Sayed Abdelazez, Silvana Aiad & Hadeer Naguib won the silver medal for their project “Microbial Desalination Fuel Cell” and Israa Naguib & Sara Ali won bronze medal for their project “Evolutionary Artificial kidney using bio-sensing technique”. Moreover Israa & Sara won special award from HUNSTEM for the same project.



3. Finally, GENIUS Olympiad is an international high school project competition. It is founded and organized by the Terra Science and Education and hosted by the State University of New York at Oswego. GENIUS Olympiad hosted projects in five general disciplines with an environmental focus, Nada Abbas from Maadi STEM School won gold medal in science.



- **STEM Schools Sustainability** - An Egypt STEM School Startup Manual accompanying the Design Blueprint was uploaded to the MOE STEM website giving the Ministry the tools needed to open new schools and continue to sustain existing schools within various governorates across Egypt.



The Egypt STEM School Startup Manual contains an introduction and background along with a master checklist and a link to the Design Blueprint which is online. The Design Blueprint allows the user to locate support documents according to the Master Checklist or any other need they have. The Tools and Resources page currently links to over 400 documents and is searchable by Design Feature, audience, document type, keywords and more. More documents will be uploaded to the Design Blueprint as the project nears its end so that it becomes more comprehensive and inclusive of all the project tasks.

- **Assessment Training** – In April 2016, ECASE coordinated a series of trainings on STEM assessment for Central and Local STEM Units. These trainings included learning how to use the Survey of Enacted Curriculum (SEC) to analyze and review assessment items for content alignment and level of cognitive demand, an introduction to curriculum learning objectives, and critical psychometric issues in construction of assessments in order to facilitate the transfer of the assessment program to the MOE. A primary goal of the training was to prepare governorate supervisors to begin assisting in the development of semester exams in cooperation with the STEM Unit and then become members of the midterm and end-of-term developer teams when they are formed.



- **Curriculum Standards** – The STEM Curriculum is standards-based and competency-based curriculum (benchmarked to Next Generation Science Standards that are seen as the international best practice) and developed with a focus on Egypt’s Grand Challenges. ECASE updated the original STEM Curriculum Standards Framework that was developed in 2011/2012 to align it with the final version of the curriculum. The learning outcomes that are currently articulated in the curriculum formed the starting point for this work. In conjunction with subject specialists from the Center for Curriculum and Instructional Material Development (CCIMD) ECASE has developed a plan for writing a unique curriculum standards for STEM Schools which will be integrated and contextualized. CCIMD is leading the process and formed 6 groups (5 persons in each) for STEM subjects Mathematics, Biology, Chemistry and Physics plus IT. These groups have weekly meetings to 1) develop the STEM Standards and 2) map these standards with US Core Curriculum Standards and Egyptian National standards. That process will result in recommendations for enhancing the national STEM subject standards which will be used by CCIMD because they are leading the process.

- **Preparatory English Extra Curriculum Activity** – On March 30 and 31 ECASE provided training for 25 Trainers, 25 Supervisors, and 50 Teachers from 50 schools in 25 governorates to orient them with the outreach plan and the e-STEM online program. The pilot phase was conducted in April 2016 in the 25 Governorates all over Egypt, 2 schools in each Governorate. The aim of the e-STEM Online Trainers and Supervisors and pilot schools Teacher Training is to support the pilot school English teachers in orienting the students with the program and providing regular follow up. Data from the pilot were collected and analyzed. Feedback from the pilot is used to refine and finalize the complete set of material for the English outreach activity. Complete report in **Annex I**.



- **Capstone Exhibitions** – The STEM Unit ran the Capstone assessments and exhibitions with support from the project team, demonstrating the success of the transfer to date at the Ministry to run Capstones.



Overall, Capstone exhibitions were successfully implemented at all schools. Student work was very good for their second semester of Capstones, demonstrating creativity, innovation and improved problem solving skills. While the level of technical proficiency covered a spectrum from developing to distinguished for their grade and experience level, on average the work seemed consistent with the Grade 10 students at Maadi and 6 October a year or two ago, when those schools were also still getting used to Capstones. This represents a very strong start and a successful conclusion to the first year of Capstones for these new schools.

- **STEM Schools End of Year Exams** -The end of year exams for Grade 1 and 2 were scheduled on May 8<sup>th</sup>, 2016. The exam development process started 2 weeks ahead before the exams date. The test developers had attended a refresher session around test specifications, which included 1) number of questions for each leaning outcome, 2) number of questions for each cognitive demand, 3) the formation of multiple choices answers and the terminology that the students are familiar with, and 4) test formatting. The tests were developed by the subjects' experts and were submitted to the schools through subject counselors' offices.

ECASE project conducted two one-day trainings for the seven new schools to support them on 1) grading final term exams and how to analyze results using Remark Program and, 2) calculating the final scores and issuing results.

**1) Remark program training:**

This training was aimed at helping and supporting the new seven schools test control officers and IT teachers in using the Remark Program software, currently installed at all STEM schools. The training used a sample data for one STEM subject, highlighting the needed steps to get the final scores for each individual student, generate analysis reports on students' response on the exams items, and relate group of questions to specific learning outcome in order to measure the students' performance in different learning outcomes. STEM Unit member (NCEEE representative) and ECASE Project's staff instructed the training.

**2) Grade one final results workshop:**

Another one-day workshop was held for new schools' principals and deputies to present to them the control sheet that has been used by Maadi and October schools, and how to create the final statistics for their school result. Maadi and October representatives were the instructors in this workshop.

- **Training** - During this quarter ECASE implemented several training sessions and STEM Unit meetings, including two assessment sessions and one session to review the curriculum standards with CCIMD and some university staff. Additionally, four refresher days were dedicated for Lab training for the new schools that have not yet receive their labs. Moreover, the project held two day workshops for preparatory outreach for English trainers and Science Club group. Finally during this quarter, the project continued to handle the MOE STEM Unit workshops and as a result 3 workshops were held successfully during this quarter to prepare for the final exams and Capstone Exhibition, and to introduce the preparatory outreach tasks. The total number of trainees to date was 361 (261 males and 100 females). (**Annex III**)

## **2. Activities leading towards accomplishment of Program objectives**

### **2.1 Project Management**

This quarter the project was officially notified on March 21<sup>st</sup>, that the Regional Inspector General of Frankfurt – Cairo Sub-office, will be conducting the performance audit of USAID/Egypt's ECASE project. The auditors had plans to coordinate site visits and interviews in the month of April, spend time at the project office to interview staff and review

documentation. The audit started with a visit to the project office on April 6<sup>th</sup>, followed by other several meetings at the office and successive trips to visit all five schools: October, Maadi, Alexandria, Dakahlia and Assiut, during the month of April. The auditors explained that their two main objectives are to: 1) Determine if project activities were successful in advancing science, technology, and mathematics for targeted students; 2) Determine if the project built the capacity of Ministry of Education staff, administrators, and teachers to replicate and sustain the Science, Technology, and Mathematics schools in Egypt. The questions of the auditors revolved around collecting information about these two topics.

This quarter the project continued submitting proposals to USAID for its extension request. An updated submittal responding to USAID's comments was sent in March and another submittal was done in April to reply to questions raised by USAID on the budget notes. In May a new budget with an updated work plan and a cost share strategy was submitted in response to USAID's request. In June two submittals were made; one that included a revised budget and an updated cost share strategy and a completed extended budget template showing in details the expenditures for the past three years with a realigned budget for the fourth and fifth years. Towards the end of the month another submittal was made including an updated budget showing the purchasing of laptops for the students in the five schools next year as per USAID's request. Another submittal was made before the end of June included answers to technical questions from USAID after budget cuts were made to some activities to accommodate the purchasing of laptop computers for students. In total, six different submittals were made during this quarter.

Towards the end of this quarter ECASE started preparing for the professional development session that will be held this summer along with the laboratory Summer Camp followed by the English summer Camp before schools start. Because the students in the four new schools of Kafr El Sheikh, Ismailia, Luxor and Red Sea did not have the chance during the past school year to be adequately trained on the use of laboratory equipment and material it was decided that the students of these four schools will spend two weeks during the summer to gain this essential experience. ECASE plans to hold a laboratory summer camp in the period from July 17-28<sup>th</sup>. The PDI will start its first week of TOT on July 24<sup>th</sup> and its teachers' training right after the lab Summer Camp to accommodate the engagement of STEM teachers in the Lab Summer Camp. The PDI is expected to end on September 8<sup>th</sup>. By that time the dates for the STEM schools English and Leadership Summer Camp will be agreed upon with the Ministry to start soon after.

## ***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 summary, below, is presented according to the last discussed version of AIP.

**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 support the Board of Trustees to ***Promote parent involvement through a school-level STEM Board of Trustees (Activity 1.2a)***, the Project team followed up with the BOTs after providing training to the Ministry Social Workers last quarter. The Ministry Social Workers were to lead training with their school's BOT and ensure that the asset mapping exercise was conducted by the BOT. The Ministry Social Workers conducted training at all schools and asset mapping has proceeded in each BOT. The social workers in coordination with the school leadership formed a team to start data collection for the asset mapping. Each team member had assigned tasks and upon completion of tasks, all data was compiled and classified in a report showing potential assets and the support and/or opportunities they could provide for the school in addition to the contact person from the school for each entity. Asset mapping results have been shared with the project team, and the results are being synthesized and summaries translated. The project team collected BOT activities this quarter connected to these assets. In the next period, the BOTs will work with the school leaders and the Ministry on a plan to utilize the assets identified for the school. Possibilities include new supplemental-curricular activities, field trips, mentors, Capstone subject matter experts, Capstone external evaluators and more. Samples of asset mapping results attached. (**Annex III**)

To ***promote the STEM school within the surrounding community through Fab Labs (Activity 1.2b)***, ECASE coordinated with MoE to have Fab Lab specialists identified for the nine STEM Schools. Fab Labs are now fully installed in five schools, while the other four schools (Ismailia, Kafr Elsheikh, Red Sea and Luxor), Fab Lab equipment were cleared by customs late June and are waiting to be delivered to schools. When the equipment is delivered, two experienced Fab Lab specialists from Maadi and 6 October will start to install and check the equipment and continue training of the Fab Lab specialists. ECASE will provide quality checks through a US Fab Lab consultant who will also lead training for Fab Lab specialists during summer PDI to ensure a successful start in the fall for these new Fab Labs and their newly assigned managers. Two Fab Labs specialists have not been assigned by the Ministry for October and Maadi and they need to be before the Fab Lab training starts so that they can benefit from it and become also prepared as their other colleagues by the start of the school year. The latest demand was made to Ms. Amany El Far, who worked with the Ministry to assign the first seven, during a meeting held at the office on July 11<sup>th</sup>.

The Fab Lab specialists have received various levels of training depending on when they were hired and their availability during trainings. Five Fab Lab specialists have received Tier 1 training during mid-year training (introduction to equipment and design), and six Fab Lab specialists (all but Ismailia) received two weeks of Tier 2 training from the 6 October Fab Lab specialists (Tier 2 is guided Fab Lab project design and implementation). The goal is to get all of the Fab Lab specialists trained through the Tier 3 level (self-directed design and implementation of an integrated Fab Lab project) before the start of the school year 2016/17.

New Fab Lab specialists will be put into Maadi and 6 October, and the current experienced Fab Lab specialists will support the Community of Practice (CoP) among the network of Fab Lab specialists starting next quarter. They will (1) lead weekly or bi-weekly conference calls

with this Fab Manager CoP, (2) organize continued training for the Fab Managers, and (3) support the Fab Manager's equipment needs, including troubleshooting and repair as needed. The goal of this support is to make the Fab Specialists CoP self-sustaining by the end of the next school year.

In order to *prepare students for the rigors of English Language based STEM education (Activity 1.3)*, By the beginning of 2016/2017 academic school year, G. 10 & 11 students at the 9 STEM schools have been oriented with the e-STEM Online designed units, registration and the program accessibility tools, navigational features of e-STEM Online, types of activities included in each unit, integrated face-to-face activities to run weekly during the school year. During the school year, the students in many of the 7 new STEM schools have received late laptops and late reliable internet service. This has affected the STEM students' accessibility to the program and the anticipated weekly follow up from the teachers.

By the end of the academic school year, the students evaluated the use of e-STEM online so that the feedback could be used to finalize the e-STEM modules that are currently being piloted in the STEM schools. Building on the students' input and evaluation, the existing units shall be refined to better suit student needs as follows:

- Units break up to be shorter and easier to manage in one sitting.
- Provide more vocabulary games.
- Cutting the length of self-assessments, or, if officially allowed, replace with more actual tests, so that students get a better balance of direct results and self-assessment.
- Providing vocab lists/unit guides.
- Align key topics to student learning outcome by identifying "core" required units which Students. have to do to meet learning outcomes of the program and provide other available material to students and teachers, for further language enrichment.
- Better orient English language teachers and STEM content teachers to the program, so that they can encourage student participation better. Report attached. (*Annex II*)

To support *Outreach to Egyptian Preparatory Schools (Activity 1.4)*, during this quarter, ECASE team finalized the STEM for prep teacher guide and drafted the training manual in preparation for training teachers. ECASE provided US sample activities and best practices to be used as a guide and provided technical support and supervision to the local team of Egyptian professionals in developing the material. ECASE facilitated a discussion meeting with the Central STEM Unit in which they presented the final version of the manual, discussed implementation options, and agreed on a proposed option to implement the STEM for prep activities as part of the optional activities that students select. A draft action memo was written to be approved and endorsed by the executive committee and counselors, ECASE will start training trainers in all governorates and plan for coordinating with the local leaders in implementing the activities in their governorates.

English for STEM, or e-STEM Online Preparatory English extra curriculum activity, is a free program of independent, directed online study, designed for preparatory schools students. The unit activities help learners enhance their English and academic skills through the study of

general English content and STEM content. During this quarter ECASE developed the English for STEM Preparatory Extra Curricular Online Learning Activity Program (e-STEM Preparatory). The program targets all preparatory students in governmental schools, orients the students to the STEM high school learning and teaching culture, and increases their interest in science and mathematics.

A Curriculum Framework Draft was designed to map the subjects, themes, topics, target vocabulary, language main skills, and academic skills to be taught and/or recycled. This framework for each unit set the objectives for each unit and the whole learning outcomes for all the 10 units. ECASE provided training for 25 Trainers, 25 Supervisors, and 50 Teachers from 50 schools in 25 governorates to orient them with the outreach plan and the e-STEM online program. The pilot phase was conducted in April 2016 in the 25 Governorates in Egypt; 2 schools in each Governorate. The aim of the e-STEM Online Trainers and Supervisors and Pilot schools Teacher Training is to support the pilot school English teachers in orienting the students with the program and providing constant follow up. The e-STEM Online resides on the free access cloud based system Schoology that allows access with a user name and password to any student wishing to use it.



The pilot phase began immediately following the training sessions. In the next sections, we shall first present the data collected on students' activities online. This is followed by a presentation of results from focus groups done with students. After this, we will present the results of the teacher survey and interviews that occurred once the piloting phase had begun. Students received an orientation to the STEM Preparatory Extra Curricular Online Learning Activity Program by their school teacher, assigned ToT and/or English language supervisor. After this orientation, they would go online to log into the course. As would be expected, the number of students registered in Schoology rose quickly in the first two weeks of the pilot phase, with over 2000 students registering during that time. The number of registered students then leveled out quickly in the third week at just over 2400, and rose slowly but steadily for the remainder of the pilot phase, ending at 2652 students registered.

Students were asked to answer the Student Survey after they completed Unit 1 and Unit 2. The response from the students who took this survey is overwhelmingly positive. Their responses indicated a generally good match for the majority of the participants. Responses indicate that making instructions more transparent would be helpful. Finally, it should be noted that teachers were very supportive and cooperative, providing feedback and help as needed. Report attached. (*Annex II*)

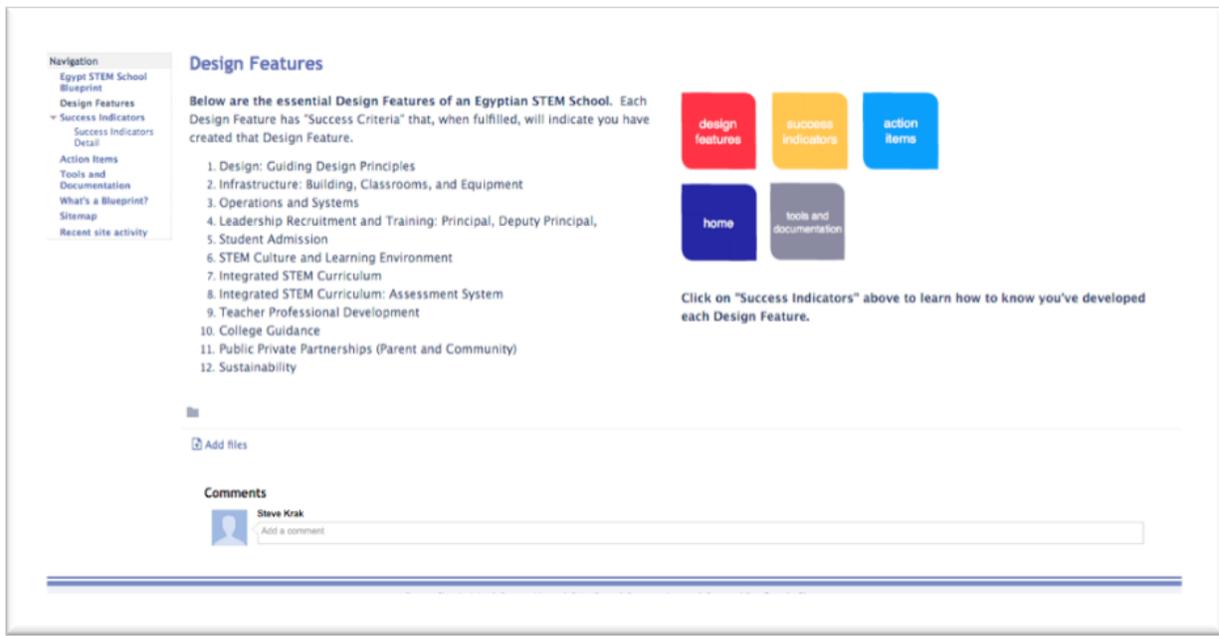
**Objective 2: Strengthen the STEM School local initiative through developing an effective model of specialized high schools focusing on science, technology, and mathematics for gifted students.**

***To tailor the STEM School to the surrounding community through school specialization (Activity 2.1)***, all school's BOT conducted training and asset mapping exercised during this quarter. The results of the local BOT asset mapping exercises are being reviewed by the project team. These asset maps will be used by the BOT, the school leadership and the Ministry to develop plans for school specialization including, but not limited to, supplemental-curricular activities, field trips, mentors, Capstone subject matter experts, and Capstone external evaluators. This process will begin next quarter, and the BOTs, school leaders and Ministry should aim to have a plan in place for each school by the beginning of the next school year.



In addition, ECASE has updated an Egypt STEM School Startup Manual and an accompanying Design Blueprint giving the Ministry the tools it needs to open new schools and continue to sustain existing schools within various governorates across Egypt.

The Egypt STEM School Startup Manual contains an introduction and background along with a master checklist and a link to the Design Blueprint which is online. The Design Blueprint allows the user to locate support documents according to the Master Checklist or any other need they have. The Tools and Resources page currently links to over 400 documents and is searchable by Design Feature, audience, document type, keywords and more.



In the next quarter, the Project Team will finish identifying and connecting more relevant documents to the Design Blueprint after having moved those documents into the STEMMASTER domain. After this, any modifications to the documents will replace the current document (not uploaded as an additional document) so that the Design Blueprint Tools and Recommendations will continue to be current.

To ***provide essential educational infrastructure to support experiential classroom activities (Activity 2.2)***. ECASE completed delivery of all Science textbooks “Biology, Chemistry, Physics and Earth Comm” for the nine schools grade 10. Now each school has 75 copies for each subject except for the Biology book which is held up in customs since March and waiting for a clearance letter from the Ministry to release it, and the Math books that are delivered to the schools already but the total number is less than 75 copies per book because of shortages in printing. The total delivered science textbooks reached 2,274 for G10 in 9 schools. Moreover, Fab Lab machines for the 4 STEM schools (Luxor, Kafr Elsheikh, Rea Sea and Ismailia), cleared from the custom and will be delivered and installed during July 2016. Purchase orders were issued for math connections textbooks (5456) and science textbooks (Biology, Chemistry, Physics and Earth Comm) (2584) grade 11 and 12 for the three STEM schools in Alexandria, Daqahleya and Assiut. All these textbooks will be delivered early next quarter.

On the other hand, the following tenders were issued and will be finalized by next quarter:

- Laptops for G10 for the 5 STEM schools
- English text books for G11 and 12
- Fab Lab electric material tender under process.
- Preparatory Schools Interactive CD (English outreach)

*The Public Private Partnership team seeks to create sustainable and mutually beneficial PPPs (Activity 2.3).* This quarter witnessed multiple activities focused on realizing and developing public private partnerships to put in place a more effective cost share plan. ECASE approached many prospects and brought others into fruition. While some of the efforts were not successful and others may still need time to develop, several appeared to be promising and could, with some additional effort, develop into valid cost share opportunities.

The project solicited the interest of Boeing Middle East through one of World Learning contacts to explore the possibility of supporting the STEM schools. It held a meeting with Microsoft Education to investigate the possibility of collaborating to provide more substantial support to the schools and the Ministry, especially TDC, as a replacement for Google products and based on the Ministry's request. A presentation was made to the German Chamber of Commerce to introduce the STEM schools' success and convince its businessmen to provide support. Various German businesses in Egypt attended the presentation and were enthusiastic about the schools like SEKEM and the Heliopolis University. In addition, ECASE met with a UNESCO representative hoping that this may lead to collaboration with the schools. It invited Fab Lab Egypt to consider holding activities in the schools to promote the use of Fab Labs after school hours pending Ministry approval. And finally, Oracle showed interest in supporting the schools through this announcement:

<https://www.oracle.com/corporate/pressrelease/oracle-joins-white-house-girls-stem-061416.html>

Oracle joined the White House this June in Global Campaign to Empower Girls and Women, where President Obama endorsed Oracle's work in advancing computer science and STEM education globally. Moreover, during this White House event, Oracle announced the following:

*Additionally, Oracle plans to expand its CS -(Computer Science) Education- efforts in Egypt with an additional investment of nearly \$1 million in educational resources and services over the next four years. The commitment is part of a new collaboration between the Ministry of Education in Egypt, the United States Agency for International Development (USAID) and Oracle Academy, Oracle's philanthropic educational program that impacts more than 2.6 million students in 106 countries. **The partnership will support computing education in nine newly-created STEM schools throughout the country**, including one boarding school exclusively for girls which will accept up the top 10 percent of girls across the governorates, reaching 150 girls each year and providing three years of paid education for each girl.*

ECASE is looking forward to partner with Oracle and has held several meetings during the month of June to cement this initiative and prepare for its launch in schools.

The MOE's STEM Unit established a PPP subcommittee to be responsible for its public private partnerships with the private sector and within government. ECASE spent time working with the PPP subcommittee training them since 2015. Its members participated in meetings with prospective partners, developed protocols and readied them for signature, and presented partners to the STEM Unit to approve their objectives and deem whether they a partnership would be beneficial. During the last quarter the PPP subcommittee followed up on a partnership with the

Ministry of Trade & Industry where a protocol was drafted and presented to the Ministry for approval. This quarter the PPP subcommittee met and initiated another partnership with SEKEM Industries. A protocol was also drafted to be presented to the STEM Unit for evaluation.

To *organize extracurricular Activities feeding STEM program implementation (Activity 2.4)*, below is the extracurricular trips for Maadi and October during last two quarters;

### **Scientific trips for STEM schools Jan.-May. ,2016**

<i>Ser. #</i>	<i>Date</i>	<i>School</i>	<i>Destination</i>	<i>No. of students</i>
1	3-Jan-16	Maadi school	Four Season Hotel to meet Dr. Sherif Dewiney	3
2	11-Jan-16	Maadi school	Oct. school for graduation day	5
3	16-Jan-16	Oct. school	Four Season Hotel to meet Dr. Sherif Dewiney	5
4	5-12 Apr.,2016	Oct. school	Geology Museum	92
5	3-Mar-16	Maadi school	Educational city	40
6	3-Mar-16	Oct. school	Educational city	50
7	7-Mar-16	Maadi school	Cement company	20
8	7-Mar-16	Maadi school	Coca Cola Company	8
9	7-Mar-16	Maadi school	Electricity Company	25
10	7-Mar-16	Maadi school	Energy Institute	27
11	7-Mar-16	Maadi school	Petroleum research institute	16
12	7-Mar-16	Maadi school	metals research institute	7
13	8-Mar-16	Oct. school	Alex library	136
14	6-Apr-16	Maadi school	Steel Factory	9
15	6-Apr-16	Maadi school	metals center	11
16	9-Apr-16	Maadi school	Nile University	45
17	10-Apr-16	Oct. school	Arab Academy in Alex	68
18	6-May-16	Oct. school	AUC	10
19	6-May-16	Maadi school	AUC	10

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

To *adapt teacher and administrator performance standards for a STEM school context (Activity 3.1)*, pathways for ToTs were further developed during this quarter. To continue that work and provide additional context and support, leadership and teacher standards were revised to meet the needs of the MoE and protocols for evaluation were drafted. These documents were created by the Central STEM Unit with project facilitation.

ECASE held a meeting with PAT leadership and the head of the Central STEM unit. Drafts of the teacher/leader evaluation protocol and the trainer certification process were shared for review and preparation for further discussion. The teacher hiring process was the focus of the

meeting. During the meeting all parties agreed that PAT completely takes over the hiring process in collaboration with the Central STEM unit and with continued technical support from ECASE. The teacher advertisement was reviewed and finalized and PAT agreed to publish it on its website and create an application form on PAT server to ensure sustainability and safety of teacher data. A timeline was developed starting with the advertisement through the hiring and training of successful candidates. The main focus of the meeting was that MoE partners will take over their relevant responsibilities: PAT will take over the advertisement, application, and administration of tests, the counselors' offices will take over the development of tests and proctoring of tests, and the head of the Central STEM unit will take over the coordination between all parties, while ECASE will continue to provide technical support as needed to all parties.

Teacher and school leader competency documents written in the last quarter have been followed by teacher and school leader's evaluation protocols and tools. These documents were created by the Central STEM Committee with the project support and supervision. School leaders were encouraged to pilot the teacher evaluation process at the end of this school year and the STEM Committee expects to work with school leaders during the Summer PD on protocols for both teacher and school leader evaluations.

***To build teacher capacity to effectively implement STEM curriculum in the classroom through Best Practices in STEM Pedagogy (Activity 3.2a)***, a four day workshop was provided for teachers in Red Sea, Ismailia, Luxor and Kafr El Shaikh for STEM teachers; none of whom received all the necessary lab equipment and materials training to conduct practical investigations this year. The lab training was to refresh their practical skills which they had not used this past year, and to have them work with experienced teachers in their fields to develop the schedule for the summer practical camp for students in these schools. A number of participants demonstrated proficiency in the required skills and a schedule was prepared.



***To build teacher capacity to effectively implement STEM curriculum in the classroom through creating formative classroom assessments (Activity 3.2b)***, Fifty seven coaching sessions were originally scheduled to be held April 10 thru May 17, 2016. Sessions were scheduled for Grade 1 teachers in six content areas (biology, chemistry, earth science, mathematics, mechanics and physics). Six sessions for each content area were scheduled for a specific day of the week (Sunday, Monday or Wednesday afternoons). Formative Assessment coaching sessions were also scheduled on Tuesday afternoons for all teachers from the seven new schools (Alexandria, Ismailia, Red Sea, Luxor, Daqahlia, Assuit and Kafr). Three sessions for each school were originally planned (Modules 1, 2, 3). Coaching sessions were held via Go to Meeting. Teachers needed to have access to a computer and internet to be able to join a session. The coaching session schedule was shared with deputy principals from each new school

for approval. Deputy Principals were to review dates and share the schedule with teachers. Coaching schedule attached (*Annex III*).

Twenty nine coaching sessions were held. Sessions scheduled for May needed to be canceled due to a holidays and conflicts with final exams. Overall, the coaching sessions were well received by the teachers. The deputy directors from each school were to be the liaison between the coaches and the teachers.

PARLO Tracker MOE/TDC guides were completed in the previous quarter. Further enhancements to MOE/TDC staff guides have been made in this quarter. PARLO Tracker user guides for teachers, principals, and students were completed and reported in the previous quarter. Updates based on user feedback and system enhancements will be done during next quarter.

Follow up Coaching was provided to the School Leadership Tracker Teams (Principal, Deputy, IT Teacher) over a 5-week period once the Egypt Tracker server was confirmed as up and running. School Leadership Teams were asked to provide their availability for coaching and sessions were scheduled around each school's needs and requested times.

Capstone formative assessments (Journals) continued at all schools this quarter, representing 40% of the Capstone grade for Grades 1 The grading of these Journals is the responsibility of teachers assigned by the Academic Deputy, and the goal is to grade the Journal responses sufficiently quickly to give feedback to the students before the next Journal (approximately every two weeks). ECASE and the STEM Unit will review the situation over the next quarter and determine whether adjustments are needed to the Capstone PDI.

The STEM Unit Capstone Manager had the responsibility of developing Capstone formative assessment (Journal) questions during this semester while getting feedback from the Project Team supporting Capstones. The Project Team on Capstones and the STEM Unit will review these assessment questions as they plan to develop a larger bank of Journal questions for future assessments over the summer.

To *support STEM Curriculum Training and Coaching (Activity 3.2c)*, virtual coaching continued in this quarter for the Capstone Leaders and Academic Deputies on the topic of Capstones. This weekly meeting was led by the STEM Unit Capstone Manager and supported each week by the Project Team using GoToMeeting. These calls resulted in problem solving for all as they prepared for their second Capstone exhibitions. The project team also participated in a Facebook group created by the Capstone Leaders that resulted in idea sharing, community building, and some troubleshooting. This Community of Practice will reduce its activity over the next quarter due to summer availability but will ramp up again for the beginning of school.

During this quarter two half day meetings were conducted with STEM Unit Curriculum Team to help them prepare for end-of-year interviews; to update and send out curriculum survey; and to initiate planning for curriculum review to be combined with experienced teacher training. The Curriculum Team of the MoE STEM Unit is taking full responsibility to complete

interviews with all teachers, to send out and analyze the curriculum survey tool, and to plan and implement curriculum review to be held July 31.

To **build teacher capacity to effectively implement STEM curriculum in the classroom through skills refresher in English language and TELIC (Activity 3.2d)**, Following a needs assessment of STEM school content teachers and curriculum customization and based on needs-assessment findings, the STEM-Teaching English Language Learners in Content Classes (TELIC) training was offered for 19 content teachers from Maadi and October schools as a part of the Experienced Teachers Professional Development Institute (PDI) during last January 2016. A two-phase training of trainers, building the capacity for 7 ToTs and 7 Supervisors from the Ministry of Education were completed.

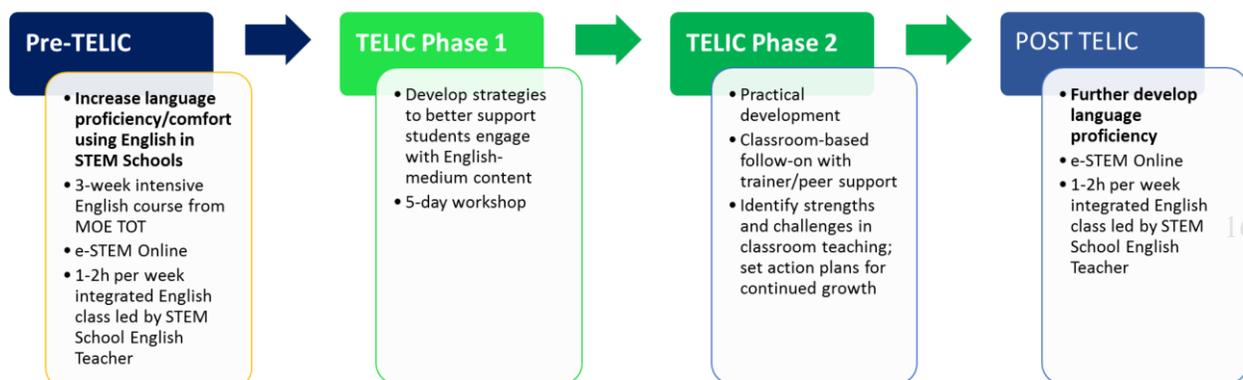
During TELIC Phase One, the ToTs and supervisors joined a one-day orientation, followed by a 5-day co-training of STEM content teachers. The Trainers and Supervisors observed all face-to-face sessions and debriefed with a TELIC specialist each day to clarify understanding of content and methodologies. Throughout TELIC delivery, the fourteen participating MoE Trainers and Supervisors also guided teachers with lesson planning, micro-teaching and feedback, and mini-language enhancement sessions.

During TELIC phase two, two ToTs and two supervisors mentored the trained STEM content teachers in October and Maadi schools. Mentoring comprised class observations, reflection on teaching, and school-based problem-solving sessions with teachers.

During the TELIC delivery, it became apparent that many of the STEM-subject teachers require more English language support. It is recommended that prior to taking the TELIC, first year STEM school teachers make use of e-STEM Online to improve their skills. This program, coupled with a once-per-week face-to-face English class conducted by the school’s English teacher, could provide teachers with the opportunity to improve their proficiency level.

In summer 2016, the MOE TOTs and MOE Supervisors who joined TELIC in January 2016 will take on full training and training-support responsibilities, under the mentorship of the TELIC Specialist. MOE TOTs will plan and deliver TELIC Phase 1 workshops. They will also orient the STEM school deputies, who will participate in the TELIC phase 2, with the training objectives, content, and structure. MOE Supervisors will take on TELIC training-support responsibilities involving guided lesson planning, micro-teaching observation and reflection, and mini-language enrichment sessions. The TELIC Specialist will observe training sessions, and guide TOTs and Supervisors in daily reflection to help them deepen their understanding and refine their TELIC training and training-support skills.

Suggested next steps to enhance STEM content teachers’ English proficiency:



***To assess progress through classroom observations (Activity 3.3)***, third party data collectors have visited schools and observed in classroom in an attempt to collect solid data on the efficacy of professional development activities. To ensure sustainability of similar assessment studies in the future, ECASE engaged a specialist from NCEEE to support the data analysis and report writing. ECASE team worked closely with the NCEEE specialist to review the data entry and start conducting statistical analysis of the data. Analysis reports were produced during this quarter which will be used by the specialists and ECASE team to write the final report.

ECASE consultants visited STEM schools in April to assess progress through classroom observations. A large portion of each visit was spent conducting joint classroom visits, comparing notes and discussing observation protocols, data collected and how best to support teachers. Most of the school leaders demonstrated an understanding of the COS and were also able to demonstrate that they had been visiting classrooms and working with teachers. Some Deputy Principals need additional training in how to support teachers, but in all schools there was some level of observation and evaluation being conducted. This is clearly a work in progress and efforts to strengthen the process will continue during Summer PD.

***To build school principals' ability to develop and implement strategic STEM action planning frameworks (Activity 3.4)***, during the months of April and June, site visits were made to all schools with the expressed priority of providing onsite professional development to school leaders. During these visits, time was spent with both Principals and Deputy Principals. The agendas included discussing classroom observations (and conducting joint observations), protocols when working with teachers, leveraging support of the BoT, and troubleshooting challenges that had arisen during the school year. Each visit ended with the creation of an action plan of 2-3 activities for each team of school leaders determined based on a priority and urgency. Many of these activities will pave the way for school leaders to create full School Improvement Plans during the Summer PD as it prompts them to consider current and future challenges and how they can address them as a single schools and system community.

In order to ***identify and build the Capacity of Master Trainer (Activity 3.5)***, the Egyptian Capstone training team provided support to the Capstone Leaders and Academic Deputies during this quarter. During the next quarter, they will again lead PDI for capstones. Special attention will be paid during this PDI to the Capstone Leaders and Academic Deputies who are managing Capstones for their schools, and with this group the focus will be gaining expertise with the system of Capstones (the need for fidelity and speed in their management activities) and expertise with the tools (Google Drive, Capstone Web App). ECASE continues to collaborate to solidify the training topics and schedule for summer PDI, to be held in the middle of the next quarter.

During this Quarter, an updated list of available and willing ToT Candidates was created and those candidates were engaged. There were in-country meetings held during the month of April to discuss not only upcoming training opportunities, but also the ToT Certification process.

During the creation of the current list, the training areas that are still in need of ToT candidates (such as Leadership) are and begin to search for appropriate and qualified candidates. Documentation was produced and provided for approval on the certification process. During the in-country meetings (one held centrally in Cairo and one each at Maadi and October Schools to meet the needs of working teachers), the certification process was explained and as collaboration with PAT continues, the expectation is that they will assume a larger role in the process. A second, virtual meeting was held in early June and both recapped the April meetings and also prepared ToT candidates for upcoming Summer PD work.

ECASE is currently coordinating with PAT to institutionalize the Trainer nomination process through an advertisement to be published at PAT website and reviewing the applications through a committee from PAT and STEM unit. Selected candidates will go through the Trainer capacity building process in preparation for certification.

*To create a virtual STEM Professional Development Learning Platform (Activity 3.6),* A new local consultant was hired mid-May, as a Google Drive consultant. Currently the consultant is working on troubleshooting and fixes to Google problems faced during the last two semesters grading and expanding the Capstone Web App to include Portfolio Grading and exhibition management. This consultant will also help in providing support to the MOE TDC on a continuous basis.

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

*To develop comprehensive national assessment instruments aligned to STEM Curriculum (Activity 4.2),* ECASE project implemented a six-step comprehensive procedure to develop operational national assessment instruments for June administration: 1) learn the lessons from the pilot test administration; 2) review and finalize the URT specifications; 3) verify the item banks for items required for the operational instruments; 4) replenish the item banks with new items as needed; 5) assemble the operational instruments in FastTest; and 6) review and finalize the instruments. The project collaborated with the MOE's subject supervisors individually and on a one-on-one basis to build their capacity in the instrument development and review process. Each step is described in the following.



1. **Learn the Lessons from the Pilot Test Administration:** Comprehensive psychometric analytical reports were produced for each subject (English, mathematics, biology, chemistry, earth science, and physics) based on the pilot tests administered in March. The reports provided detailed information about what worked (with acceptable psychometric properties) and what did not work (problems with item stems or options) for each item on

the pilot tests. We went through the reports individually with each subject supervisor, and discussed the observed profiles or characteristics of acceptable and unacceptable items in the pilot testing so that they could use the acceptable profiles for the construction of operational items and tests. The reviews of the analytical reports had provided them with firsthand experience in the understanding and interpretation of various item statistics (e.g., difficulty, discrimination, differential item functioning, etc.) and psychometric measures. This activity was carried out on April 10-11.

2. **Review and Finalize the URT specification:** The subject supervisors were provided another opportunity to review and finalize the URT specifications [i.e., a matrix representing sub-content categories in the rows (e.g., differential and integral calculus, probability, etc.), item cognitive complexity in the columns (e.g., low, medium, and high), and the numbers in the cells that represent the number of items on the URT]. These specifications are not expected to be updated before there are significant changes in key learning outcomes, which is not expected to occur anytime soon. Most of the subject supervisors agreed to include more sub-contents and topics from the STEM curriculum into the specifications so that they could be more flexible in choosing different combinations of sub-contents for the URT in different years. They also identified a list of sub-contents from the specifications that they had decided to include in the June operational administration. This activity was carried out on April 11-12.
3. **Verify the Item Banks for Items required for the Operational Instruments:** After determining the number of items needed from each sub-content, the subject supervisors went through their respective item bank to confirm whether the item bank had the required number of items with appropriate cognitive levels (excluding the ones used in the pilot testing), or they had to develop new items to match the specifications of the operational instruments. On several occasions, we found that although the banks had items needed for the operational instruments, we could not consider them due to the lack of matchings with the profile of acceptable items. This activity was carried out on April 12.
4. **Replenish the Item Banks with New Items as Needed:** The subject supervisors developed new items needed for the operational instruments using the item development principles, and then entered the new items into the banks (in FastTest). The number of new items developed varied substantially across the subject areas. For instance, zero new items were developed for English, and a few were developed for mathematics, while a significant number of new items were developed for biology. This activity was carried out on April 12-13.
5. **Assemble the Operational Instruments in FastTest:** After the subject supervisors confirmed that their item banks had an adequate number of items (also matching with the profiles of acceptable items) needed for the operational instruments, they started assembling the instruments in FastTest. During the assembly, it was ensured that the

instrument completely met the specifications. This activity was carried out on April 13-14.

- 6. Review and Finalize the Operational Instruments:** We reviewed the instruments individually (including the passages, stems, correct keys, and distractors) with each subject supervisor and made necessary changes to the contents to make the instruments valid and fair. During the review of item stems and options, we ensured that each item had only one clearly correct answer, distractors were relevant and sufficiently plausible, and the stems were clear and precise without being unnecessarily wordy. This activity was carried out in April through May.

Since the items on the URT are mostly passage dependent (except for mathematics), there is a constant challenge in locating the passages aligned with the STEM learning outcomes. Therefore, it was strongly recommended to the subject supervisors that they collect the aligned passages, write new items, and replenish their item banks throughout the year. It was also observed during the instrument development process that the subject supervisors continued to struggle with the selection of passages and the development of new items, with a few exceptions. Moreover, they had a minimal understanding of item development principles when writing new items. Additional training and more item writing practices would be effective in changing their current item writing behavior.

Throughout this quarter, ECASE project in cooperation with MOE has continued to work on an Egypt STEM Project Assessment Plan for the remaining of the project, which focuses on the development of national assessment instruments aligned to the STEM Curriculum. The mid-term, end-of-semester, and practical exams are previously developed and still continue to develop the majority of the Test of Concepts. Considerable training and support for MOE test developers has been provided. The current plan focuses on continued training and support, and the transfer of responsibility for development of the Test of Concepts (TOCs). A primary focus for the MOE is on improving the skills of the governorate supervisors so that a select group of them can take over item development for the mid-term and end-of-semester exams.

Professional development sessions will be held for groups including governorate supervisors, test developers in the Math and Science Counselors' offices, STEM department members, and school leaders and teachers. There will be planned training sessions during the summer PDI and future PDIs on formative assessments, summative assessments, the use analysis of data to inform instruction, and the Test of Concepts. Trainings in each of these areas will be tailored to the needs of the representative group.

In terms of the governorate supervisors, trainings will concentrate on understanding of the principles and practice of formative assessment and PARLO to provide instructional support and accountability for teachers, and applying the understanding of how the PARLO teaching and assessment system used in the Egyptian STEM schools affects the design of mid-term and final exams. In terms of summative assessments (i.e., mid-term and final exams), governorate supervisors will receive guided practice and feedback on writing high quality multiple choice

and free-response assessment items that are valid (i.e., measure LOs), and include appropriate and accurately designated cognitive demand levels according to the exam frameworks. Feedback on item development will be provided and recommendations for structures to facilitate their involvement in the assessment development system.

During the third quarter of Year 4, virtual meetings continued between the ECASE project consultants and the MOE STEM Unit representative for assessment in Egypt. STEM Unit representative continued to facilitate sustainability by working to coordinate assessment initiatives on the ground for the Egyptian STEM Project, providing STEM assessment frameworks to STEM test developers, providing STEM assessment information to students and teachers, and leading some assessment trainings and co-facilitating others with the support of ECASE consultants. The joint work focused on providing support, coordination, planning, and development for assessment issues of around the development and administration of summative exams, formative assessment and the use of data, the design and development of the Year 3 Test of Concepts, the content of professional development for governorate supervisors, school leaders, and teachers, and the systematic transfer of the Egypt STEM Project's assessment program to the MOE.

ECASE Assessment Team worked with STEM Unit representative to develop practices around advanced uses of Remark software (to score subjective questions and to implement curves) and to set up a process to produce PARLO ratings from exams using a set of pre-agreed upon criteria. Also joint work to develop a manual related to the production of final scores (both overall and PARLO ratings) for midterms and finals is ongoing.

In April 2016, ECASE coordinated a series of trainings on STEM assessment item development and supervision of formative assessment teacher practice for the governorate supervisors and newly appointed test developers in the math and science Counselors' offices were also invited. These trainings included learning how to use the Survey of Enacted Curriculum to analyze and review assessment items for content alignment and level of cognitive demand, an introduction to curriculum learning objectives, and critical psychometric issues in construction of assessments in order to facilitate the transfer of the assessment program to the MOE. A primary goal of the training was to prepare governorate supervisors to begin assisting in the development of semester exams in cooperation with the STEM Unit.

The Survey of Enacted Curriculum (SEC), developed by John Smithson of the Wisconsin Center of Educational Research, is designed to align learning outcomes and assessment items both in terms of their disciplinary content and their level of cognitive demand. The goal of the first week of training is to work with governorate supervisors to prepare them to use the SEC to both analyze the STEM School Learning Outcomes and to facilitate their understanding of cognitive demand



as applied to assessment item development.

One of the STEM unit members who had previously trained on SEC was sufficiently proficient in its use that he was able to assist training. After a general training on the SEC, which included developing such skills as interpretation of the SEC output displays of data, governorate supervisors were broken down into discipline-based teams of Life Science, Earth Science, Physics, Chemistry, Mathematics, and Mechanics, and to participate in a practice analysis of sample assessment items. Once skilled in the application of the SEC, the content groups of governorate supervisors analyzed the STEM curriculum Learning Outcomes (LO) in their specific content area. Data generated from SEC was collected to analyze the LOs for further use in the project.

A second week of training for governorate supervisors and other MOE staff was delivered. This training focused on formative assessment classroom practices and summative assessment development, concentrating on the writing and critical evaluation of multiple-choice exam items for Egyptian STEM School assessments. Included in the training were presentations and skill development activities on the comprehensive assessment design process, the theory and practice of formative assessment including the PARLO philosophy (Proficiency Assessment and Reassessment of Learning Outcomes), learning progressions and their connection to formative assessment, and criteria for high quality multiple choice assessment items. During the training, supervisors created assessment items based on criteria learned during the training and evaluated the adequacy of items with regards to criteria presented. The supervisors also 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. The goal of this process was to have supervisors develop an appreciation for the need for multiple assessments, understanding that no one test score is sufficient for making high stakes decisions, and for formative assessment, it is necessary to collect information frequently with constant feedback to students.

It is planned to continue the assessment training during summer PDI with the governorate supervisors focused on further developing their skills so that they can be active participants in STEM School assessment development and facilitate high quality supervision of teachers' formative assessment practices.

Technical support will continue throughout the project to updated PARLO tracker software and implementation on MOE server. Developed and implemented an enhanced user interface for MOE to monitor the implementation of TRACKER in all schools. The development and implementation of the New Year Rollover process and enhanced user interface for MOD/TDC for administration of TRACKER will be completed in the following quarter.

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

***In efforts to support the Ministry of Education STEM Unit and its member organizations (Activity 5.1), ECASE partners continued to work with members of the MOE***

STEM Unit on a weekly basis throughout the quarter to allow collaboration and transfer of knowledge to enable the MOE to sustain the work. Most transfer occurred this quarter during the process of creating evaluation documents, allowing the STEM Unit more responsibility in the oversight of the STEM Schools. Many of the STEM Unit members are planning and/or facilitating upcoming Summer PD. Emails and teleconferences with members of the STEM Unit have maintained the lines of communication and provided support to in-country personnel who had access to the schools.

To support ***Upgrading STEM National Curriculum Standards (Activity 5.1)***, ECASE project content leaders met in early May, 2016 to match the Learning Outcomes from six content areas of the Egyptian STEM School Curriculum to NGSS, AP or College Board standards. This work was shared through a four day workshop with 40 leaders the week of June 12 in country. CCIMD members of the MoE STEM Unit are back-mapping learning outcomes to the Egyptian content standards, and STEM discipline teams are currently drafting standards language.



To ***Build the capacity of the CCIMD and NCEEE to apply Egyptian STEM best practices to mainstream science and math curricula (Activity 5.2b)***, CCIMD, NCERD and NAQAA are all working together on drafting the STEM content standards, and NAQAA will be using the STEM Framework to develop standards for all STEM schools. These three organizations, plus NCEEE are exploring ways that best practices and lessons learned from the STEM school project can be applied to general education.

To ***continue Capstone Curriculum Implementation and Training for all Grades (Activity 5.3)***, the focus of this quarter was the completion of the second set of Capstone Exhibitions among the new schools. This also became the focus of the Capstone CoP including Capstone Leaders and Academic Deputies from all of the schools. The STEM Unit Capstone Manager led these meetings and addressed common concerns and issues. All Capstone documents have been updated and linked to the Egypt STEM School Blueprint so that, together with the New School Manual, they will be useful for the next STEM school opened by the Ministry. Finally, the STEM Unit ran the Capstone assessments and exhibitions with support from the Project Team demonstrating the success of the transfer to date, what remains to be transferred and the need for additional capacity at the Ministry to run Capstones.

A Capstone Startup Manual was created for the STEM Unit as the audience based on the Capstone Startup Manual created for the school leaders. Accompanying the Capstone Startup Manual for the STEM Unit is a Capstone Checklist and Timeline document.

All other Capstone tools and processes went through another iteration addressing required updates and increased process documentation. The updates touched every Capstone

document including over 90 documents, web apps, processes, templates, and surveys. Examples of these documents include processes for monitoring journal assessment process, quality assurance for the Journal assessment, Academic Deputy Capstone roles and responsibilities clarification, a minor exhibition rubric update, a revised Capstone exhibition checklist, and startup checklists for Capstone Leaders and Academic Deputies. The Project Team also drafted requested processes and protocols for Capstone related topics such as academic honesty to add to the Student and Parent Handbook. These will be shared when finalized.

Journal assessment questions were created by the STEM Unit, reviewed by the Project Team, and administered by the STEM Unit and Academic Deputies.

Capstone Leaders and Academic Deputies used Capstone checklists provided to them during the winter PDI, overseen by the STEM Unit Capstone Manager and the Project Team. The STEM Unit led external evaluator training and together with the Project Team monitored their pre-exhibition assessment progress.

Capstone exhibitions were successfully implemented at all schools. Student work was very good for their second semester of Capstones, demonstrating creativity, innovation and improving problem solving skills. While the level of technical proficiency covered a spectrum from developing to distinguished for their grade and experience level, on average the work seemed consistent with the Grade 10 students at Maadi and 6 October a year or two ago, when those schools were also still accustomed to Capstones. This represents a very strong start and a successful conclusion to the first year of Capstones for these new schools. Strong performance seemed to correlate with strong leadership.

The Capstone final grades consist of weighted scores for journals, posters, prototypes and portfolios. The review of all the grades and weightings took place. The review and corrections are finalized and the grades have been turned over to schools.

One of the Capstone grade management process goals is for the user interface to be easy and friendly. There are a couple places that slowed down the Capstone grade turnaround. The following are a couple examples:

a. Capstone Poster and Prototype evaluation process includes evaluators writing in final evaluation results on a pre-assessment document. Since the changes are handwritten, inputting the information into the Master Evaluation Database requires a person to input all of the changes by hand followed by an audit of the input to assure data are accurate.

b. School data to Master Evaluation Database requires schools to finalize portfolio and journal results, student Capstone team assignments etc. Several schools had to be contacted to finalize journals and portfolios to make the data available to the Master Evaluation Database. Some student names were different from the list schools previously sent, so connecting evaluation data to the students took some time.



A review of the Capstone Grade processes and tools is underway and will be completed prior to the start of PDI. In addition to reviewing and updating current processes and products, additional tools will be added to the Capstone App to support the Capstone Exhibition evaluation process.

The Google Drive system for supporting Capstones was run by the Project Team again, and a parallel plan has begun to ensure a sustainable system to support Capstones after the project has concluded. The user interfaces, including the Curriculum Web App and the Capstone Web App have proven to be useful to the schools and to the project because they remove the need to engage the databases themselves and they provide oversight of Capstone processes by Academic Deputies, Supervisors and the STEM Unit. The Capstone Web App is currently limited to the Journal assessment process and will begin to be expanded to the summative assessments including the exhibition implementation and data management in the next quarter. The Project Team will continue to improve the robustness of the database and the user interface while also increasing the engagement of the Ministry to take over this system in the Fall of 2016.

### **3. Challenges and Resolutions**

After our PPP Manager left the project in December, ECASE exerted every effort to recruit a qualified candidate who can help the project fulfill its cost share obligations. The project advertised in the International NGO HR group of which it is a member, at the AUC CAPS recruiting website, at the local employment website WUZZUF, and at the DevEx international development recruitment site. When no candidates were found, ECASE commissioned the services of a recruitment agency to help the project hire the most qualified candidate available in the local market. One major obstacle that faced the project in hiring qualified candidates was the uncertainty of its extension. At this time ECASE can only sign employment contracts until the end of August 2016, and cannot extend the term of employment of any of its employees or new hires beyond that date. It was very difficult to convince a qualified candidate to leave their position and join a project for a few months, although a one year extension was eminent. The recruitment agency was able to persuade a candidate whom the project met and approved after interviewing and reviewing her credentials to start in mid-July. She comes recommended from Misr El Kheir; Egypt's leading philanthropic foundation and its largest recipient of private contributions, where the candidate is one of its fund raising managers.

This quarter the project continued submitting proposals to USAID for its extension request. The delay of the extension approval affected project and partner staff morale due to the uncertainty of the upcoming months. ECASE may face a situation with staff submitting their resignation and management having to pay their severance due to the delay in the approval.

***Annex I: ELP Report***

***Annex II: Training Events***

***Annex III: Virtual Coaching Schedule***

***Annex IV: Meetings Minutes***

***Annex V: Project Geographic Locations***