SAN DIEGO STATE UNIVERSITY – GEORGIA: INTRODUCTION OF ACCREDITED AMERICAN STEM DEGREE PROGRAMS IN THE REPUBLIC OF GEORGIA

H. Güven
San Diego State University (UNITED STATES)

Abstract
San Diego State University (SDSU) established a Science, Technology, Engineering, and Mathematics (STEM) campus in Tbilisi, Georgia, in 2014. SDSU Georgia (SDSU-G) admitted its first cohort of students in 2015. Currently there are more than 500 students (4 cohorts) studying at Georgia campus in seven STEM Bachelor of Science (BS) degree programs. SDSU-G will have its first group of graduates in summer 2019. By 2023, SDSU-G will graduate five cohorts and 600+ students in total. Besides offering U.S. University bachelor’s degree in Georgia, SDSU is engaged in: Faculty development efforts for Georgian faculty; Faculty exchange programs for Georgian and SDSU faculty; Student exchange programs for Georgian, and U.S. students; Infrastructure upgrades for Georgian teaching environments; Provision of equipment and technology for teaching classrooms and laboratories. The paper presents the methodology and the experiences in the introduction of accredited American STEM degree programs in Georgia, and the challenges faced in designing a pathway to obtaining American ABET (Accreditation Board for Engineering and Technology) accreditation and ACS (American Chemical Society) certification in the Georgian public higher education institutions.

Keywords: San Diego State University, SDSU, ABET, ACS, Accreditation, STEM.

1 INTRODUCTION
Georgia is a “resource-poor” country in terms of oil or gas, and must depend on agriculture, manufacturing, and tourism to develop its economy. It has a critical shortage of science, technology, engineering and mathematics professionals, educated to current international standards, graduating from their institutions of higher education. To address this problem, the Government of Georgia (GoG) and the United States Government, through the Millennium Challenge Account-Georgia (MCA Georgia), with funding from the U.S. Millennium Challenge Corporation (MCC), an independent U.S. government agency with a board chaired by the U.S. Secretary of State, contracted with SDSU to provide an American university education in Georgia focused on STEM disciplines that would improve human capital in the Georgian labor force.

SDSU is approaching this project in partnership with Tbilisi State University (TSU), Ilia State University (ISU), and Georgian Technical University (GTU) – the three premier public universities in Georgia – to provide Bachelor’s degrees in the country of Georgia. Using the facilities of these three universities, San Diego State University Georgia (SDSU-Georgia) focuses on STEM education to train an advanced workforce to meet the growing needs of Georgia.

This project is intended to improve human capital in the Georgian labor force by increasing the number of high quality scientists and professionals for companies operating in Georgia, to contribute to economic growth, and enhance employment in companies requiring market-driven skills. It also aims at building capacity in the Georgian higher educational institutions by renovating infrastructure, training faculty members, and by guiding Georgian public institutions to acquire American accreditation (or certification) for their own STEM degree programs. The MCC Compact started on July 1, 2014 and will end on July 1, 2019.

The project completed its fifth year of operation and five cohorts are recruited in seven bachelor’s programs. One of the partner universities completed its preparations for the ABET accreditation of its electrical engineering and computer science programs. SDSU-G is having its first commencement in Tbilisi with a graduating class of 51 on June 3, 2019.

This paper presents the methodology applied by SDSU in addressing / fulfilling the goals defined by MCC and the GoG [1], and the results obtained.
2 METHODOLOGY

SDSU is offering STEM bachelor’s degrees based upon recommendations of the GoG. The curricula and courses offered are equivalent to those offered at SDSU home campus. This program meets SDSU standards for curriculum, faculty training, and accreditation. As with all SDSU Bachelor’s degrees, this program also includes general education to provide students with breadth in the liberal arts so necessary for an advanced workforce that will enhance the economy of the country. Students enrolled in SDSU-G are fully matriculated SDSU external degree students studying the exact same curricula as their peers on the main campus, but taking their classes at the Georgia campus. All instruction is in English. SDSU employs both team-teaching and co-teaching modes, and courses are taught by SDSU faculty, as well as partner university Georgian faculty trained by SDSU. In addition to regular classes, SDSU-G offers limited number of on-line courses, and some hybrid classes. SDSU-G students receive a main campus WASC and ABET accredited (or ACS Certified in the case of Chemistry / Biochemistry) SDSU diploma with all its privileges.

In addition, SDSU-G students are fully matriculated students in one of the Georgian Partner universities, earning a second diploma from either TSU, or ISU, or GTU. That is, a TWO DIPLOMA model is being implemented.

SDSU is responsible for admissions, curriculum, quality of instruction, renovation of facilities, updating equipment and implementation of the program. In addition, SDSU-G is responsible for building capacity for the partner universities in STEM fields, and also to help them in acquisition of ABET accreditation.

Accreditation of engineering and computer science degree programs in TSU, ISU and GTU are sought from ABET, and certification of their Chemistry/Biochemistry program at TSU is sought from the American Chemical Society (ACS).

2.1 Phased Implementation and SDSU-G Campus/Office in Georgia

Prior to establishing campus in Georgia, SDSU solicited input from partner institutions and thoroughly evaluated existing and planned curricula in the target disciplines. Under consultation with the partner institutions, SDSU-G used a launch strategy that leveraged the first Compact Year [1]:

- to establish a program office with appropriate recruiting and outreach capabilities, and a focus on constructing and renovating facilities, training faculty and staff, and implementing the educational programs in the subsequent years;
- to enhance existing relationships with partner institutions, and developing additional relationships with academic, industry, and government institutions to further enhance the quality and impact of the SDSU-G program.

![Figure 1. As the program progresses the responsibilities of the partner institutions take precedence.](image)

During this initial “implementation” phases of the program, the main focus was on identifying and collaborating with the Georgian partner institution faculty to modify their course content, teaching mode, laboratory experiences, and assessment, to match SDSU and ABET/ACS requirements. During the “evolution” phase, collaborating Georgian faculty adopted increasing responsibility for direct
implementation and instruction of the approved curriculum. During this phase, collaboration through in-person co-teaching and online mentorship continued. Fig. 1 presents investment expenditures that decline with program progress, as the responsibilities of the Georgian partner institutions take precedence.

In Compact Year 1, resource allocation was finalized for establishing relevant technical laboratories across the three partner institutions, outfitting appropriate digital media, computer laboratories and teaching assets at TSU, ISU and GTU, and establishing a methodology for preserving partner institution budget allocation from the GoG while simultaneously supporting the costs of the new program development and delivery.

In Compact Year 2 (Academic Year 2015-2016), SDSU-G started offering programs. Initially, four programs were offered: Chemistry, Chemistry with Biochemistry emphasis, Computer Engineering, and Electrical Engineering. In 2016-2017 Computer Science program was added, and in 2017-2018 SDSU-G started offering Civil Engineering and Construction Engineering. The seven programs correspond to accredited degree programs at SDSU home campus. The fundamental approach of the degree offerings was to assist the three Georgian partner institutions (TSU, ISU, and GTU) in adopting the existing accredited curricula from SDSU [1].

2.2 Faculty Development Program with Partner Universities

Faculty Development activities are conducted as a part of the capacity building strategy for SDSU-G project. Each semester, Georgian faculty nominated by their respective partner universities are selected to visit the home campus to build familiarity with SDSU curricula, develop teaching skills within specific courses that they might later assist with or teach in Georgia, develop laboratory skills, an understanding of SDSU’s assessment practices, and to build collaborations with SDSU faculty, both in terms of teaching and research. During these visits, each of the visiting faculty members are paired with a faculty member in their discipline on home campus. The SDSU host serves in a mentoring capacity during the visit and afterwards, when the Georgian faculty starts teaching in the SDSU-G programs. First cohort of Georgian faculty visited SDSU home campus in summer 2014. There have been ten cohorts since [5].

2.3 Student Recruitment

Student recruitment for 2015-2016 cohort started in early 2015, but since Georgia has a centralized university placement (in addition to a centralized exam), SDSU-G’s first year recruitment strategy was confined to school visits only.

For the 2016-2017 Academic Year (AY) SDSU-G introduced an “Early Application System” to create a hybrid recruitment model (American – vs – Georgian centrally controlled placement). The recruitment process used by SDSU-G includes the following stages of activities: In September, “Apply-SDSU”, an on-line application tool, is opened on SDSU-G website for the potential applicants for the next academic year’s admissions. Early deadline for submitting the application is January. Prospective students are asked to submit their high school grades in sealed envelopes. Applicants seeking financial assistance are asked to submit a financial data form documenting family finances (yearly disposable income, home at its market value, other property, loans payable, declared ability to finance tuition, etc.). Applicants are then interviewed by a scholarship committee. After evaluating prospective students’ academic records, SDSU Enrollment Services on the home campus issues conditional admission letters to the early applicants by March. At the last stage, in April-May, the applicants who are academically and financially qualified are offered scholarship (based on their financial information and the interviews/academic records).

By law, students seeking admission to higher education institutions in Georgia are required to take central university entrance exams administered by the National Assessment and Examinations Center (NAEC). Students are also required to state, and rank order, their preferences of universities and programs. Exams are organized in June-July and the results are reported in August of each year. After the exam scores are announced in August, students can change their ranking until the end of an appeal period.

Even though the applicants are selected and funded by SDSU-G before the NAEC exams take place, NAEC results are the last step to admit students into the SDSU-G and the Partner University joint programs in September. SDSU-G determines thresholds for each required subject of the National exams every year [1].
2.3.1 Increasing awareness of STEM Education and Recruiting Tools

SDSU-G’s countrywide recruiting campaign is aimed at increasing awareness of the importance of STEM education. This is done through school visits, media relation campaigns, and STEM events. SDSU-G’s recruiting and outreach efforts employed several tools designed by SDSU-G and CIE [2]:

1. **Presentations, info session visits to high schools** in Tbilisi, and regions of Georgia, to raise STEM awareness, and promotion of programs offered by SDSU-G. SDSU-G recruiting team typically visits 250-300 schools each recruiting season in Tbilisi and in the regions;

2. **STEM Academies in Tbilisi and the regions**: STEM Academy is a day long event that provides information about the program, experiment demonstrations, presentations by current SDSU-G faculty and students. SDSU-G holds 8 to 10 STEM academies each recruiting season to give the attending high school students a better understanding of the importance of STEM education and the opportunities on the job market for STEM graduates;

3. **Database of 12th graders interested in STEM**. SDSU-G recruiting team communicates with students in a CRM database with important news and success stories of SDSU-G students;

4. **Facility tours** for prospective students and their parents;

5. **STEM Parent Info Sessions** organized in Tbilisi and the regions each year to continue to sustain parent interest and demand for the STEM education;

6. **STEM Teachers info sessions**, organized in Tbilisi and the regions every year;

7. **US Education Fairs** in Tbilisi and neighboring countries of Georgia to recruit international students.

Starting from 2019, SDSU-G recruiting team has started working with partner universities to train their staff and help them implement their own recruiting tools for the STEM programs that are being transitioned to the partner universities in the coming years. Fig. 2 presents the 2019-2020 Recruiting Timeline for the fifth cohort as an example.

Regional recruitment campaign, comprised of diversified programming, reaches more than 300 public and private schools nationwide, including specialized science schools in Tbilisi and around the country. The information sessions are targeted to identify potential academically driven students with strong background in STEM, as well as students with diverse backgrounds, coming from low-income families, IDPs, minority groups, female students and other socially vulnerable categories. In addition to nationwide outreach and recruitment, SDSU-G has been able to outreach students across the administrative border in Abkhazia, which resulted in the first time enrollment of students from Georgia’s occupied territory of Abkhazia.

2.3.2 Student Tuition

Tuition at SDSU-G programs has been set to ensure the long-term sustainability of this innovative program, considering student financial assistance is a critical component of the SDSU-G tuition-based STEM undergraduate degree program. In order to attract high-performing yet financially disadvantaged students, a robust scholarship and financial assistance model has been put in place for SDSU-G programs [6]. SDSU-G established a Public Private Partnership Fund (PPPF) to generate resources to
provide scholarship funds for successful, socially vulnerable students in the country. Total commitment of Private sector to SDSU-G scholarship funds is $3,289,836 [7].

Scholarships and Financial assistance grants are based on student merit and/or the demonstration of financial need. Students complete a financial assistance application to be considered for scholarship support, where they can provide information about their academic performance (merit) and need. Key factors in the needs-based determination are: a) whether or not the prospective student’s family is eligible for pecuniary social assistance from the GoG Social Services Agency, and b) financial disclosure forms [6].

2.3.3 Enrollment and retention of women, minorities, low-income students, and other disadvantaged populations in STEM

Georgia’s economic activity and population is concentrated in her capital city, Tbilisi. There is significant economic parity between Tbilisi and the regions outside Tbilisi (referred to as “regions” in this paper). Students from the regions do not have access to quality academic tutoring, and other facilities available to students in Tbilisi; as a result, they cannot score high in the NAEC exams. SDSU-G has targeted its recruitment activities to reach and prepare disadvantaged and underrepresented populations from the regions for success in the program. In particular, recruitment of girls into STEM was targeted and incentivized. SDSU-G has been able to raise funds to provide need-based scholarships for these disadvantaged groups, offer preparatory English and STEM training to improve their competitiveness and help them qualify English language requirement of the program [6].

2.4 Student Learning and Support Programs

Academic support, including textbooks, lab supplies, and services such as student academic advisors, mentors and tutors, and opportunities for student experience development activities have all been specifically incorporated into the project and budget to include both group and one-on-one student services. These programs are implemented in close consultation with SDSU-G, Partner Institutions, and the SDSU-G student body [4].

2.4.1 English Language Academy

Because English is the language of instruction in the SDSU-G Bachelor’s degree programs, to enroll, students must get a passing score from NAEC’s English Exam. In addition to the Georgian national English exam, all Georgian (and international) students who enroll in SDSU need to pass the TOEFL in accordance with the SDSU requirements. Thus, a key objective of SDSU-G is to provide an opportunity for students, including those from socially vulnerable groups who are likely to have less facility in English, to enroll in, and successfully earn an internationally accredited undergraduate STEM degree. To this end, in addition to meeting the initial minimum NAEC English requirement, students must have a reasonable facility in speaking, writing, reading, and comprehending English language to be successful at SDSU-G where instruction is in English. Therefore, an intensive English Language Academy (ELA) has been established to support preparation of students for enrollment in a SDSU degree program. SDSU engaged a service provider in Georgia, CIE (Center for International Education [2]) to initiate and implement English language support, which was overseen by qualified language instructors/administrators from SDSU.

The ELA program referenced above is further expanded through the development of an English Language Development Center (ELDC) at SDSU-G, and integration of English language learning and support activities that connect with and contribute to our student life program.

A Help Desk program has been successfully implemented to assist students deficient in pre-Calculus, Calculus, Physics, and Chemistry classes. The Center employs student mentors and works with students to improve their study skills [6].

2.4.2 Introducing the Associated Students Board of Directors (A.S.B.O.D.)

As part of introducing SDSU student life practices, SDSU-G organized, and the student body elected its first Associated Student Chapter of SDSU-G in December 2017. This intended to help keep the finger on the pulse of student satisfaction. SDSU-G A.S.B.O.D. has successfully connected with the SDSU A.S.B.O.D. to further their understanding of how a student body organization should function. SDSU-G supports the new initiatives of the board to stimulate the student life experience.
2.4.3 Career Development Center

In 2018, SDSU-G established a Career Development Center (CDC), aiming to equip students with good self-presentation skills, and also to market student skills to public and private partners. Students are trained in resume writing and job interview techniques by CDC staff and invited guests. MOU's are being signed with public and private partners to create employment opportunities for students. An Employment Relations Manager has been dedicated to communicate with public and private partners on student internships and employment.

2.5 ABET Accreditation Process

ABET accreditation provides assurance that a college or university program meets the quality standards of the engineering and technology profession. The initial goal of ABET/ACS accreditation activities implemented by SDSU-G with the help of MCA-Georgia was to ensure partner university programs would be in the process of applying for ABET or ACS accreditation by 2020. In this context, the core methodology proposed by SDSU-G, to facilitate the accreditation of the partner institutions’ programs, was to overlay SDSU’s existing, and accredited, curricula onto the framework already provided by the partner institution. This is later named as the “First-track” ABET accreditation path.

In the Compact Year 2, SDSU-G provided a follow up recommendation: It may be possible to consider additional pathways, a “Second-track” accreditation path, to facilitate the accreditation of programs at the partner universities that do not bridge through the SDSU-delivered programs first. The ABET Second-track accreditation path is defined as the accreditation of existing Georgian language STEM programs at the partner universities.

SDSU-G proposed to assist partner universities to obtain ABET Second-track accreditation for a few of their existing Georgian language STEM programs (“pilot programs”), for which they already have a number of graduates working in the industry. Based on a preliminary assessment of this idea, SDSU-G determined that it may be possible to complete ABET Readiness report for the Second-track pilot programs by 2018-19, and potentially have ABET accreditation for the pilot Georgian language programs in the 2020-21. ABET COMMITTEES were formed at the Partner Universities (PU’s) to implement this and the First-track ABET strategies [3].

2.6 ACS Certification Process

ACS Certification of TSU Chemistry / Biochemistry program is planned for 2021. SDSU-G started preparing for the independent standalone TSU Chemistry program certification on February 9, 2018 by asking TSU Rector’s Office to form a TSU ACS certification committee. For ACS certification, TSU English language Chemistry program needed to be established and this program needed to establish “track record” in having Georgian colleagues take over the teaching of the lectures, and lab instruction, for the required courses. Each required course taught by the Georgian colleagues, and each major instrument (Nuclear Magnetic Resonance Spectroscopy, etc.) installed on the TSU campus is an ACS milestone. First meeting of the TSU ACS committee took place in May, 2018 at TSU. Also in May, 2018 ACS-SDSUG Student Chapter helped coordinate and sponsor a two-day International mini-Symposium at TSU. Second ACS Symposium will be held on May 31–June 1, 2019 where a Republic of Georgia chapter of the American Chemical Society will be launched [1].

3 RESULTS

3.1 STEM Awareness and Recruitment

Nationwide recruitment and STEM awareness activities conducted by SDSU-G aimed at increasing awareness, and the importance, of STEM education. SDSU-G’s STEM degree programs were promoted through school visits, media relation campaigns, and STEM events. SDSU-G recruited a total of 642 students in 4 cohorts for 7 degree programs: Chemistry, Chemistry/Biochemistry, Computer Science, Computer Engineering, Electrical Engineering, Civil Engineering, and Construction Engineering. SDSU-G recruited 86 students in its first cohort (2015-2016), and 127 students in the second cohort (2016-2017). Third cohort of students was admitted in year 2017-2018, numbering about 210 which is about 75% increase over the number of students in the second cohort. Admission of the third cohort doubled the total number of students enrolled in SDSUG programs from 200 to 400+. The fourth cohort added another 220+ students to the recruited student pool. SDSU-G also succeeded in recruiting almost 10% international students from countries neighboring Georgia. The fifth and final
cohort with four degree programs: Chemistry/Biochemistry, Computer Engineering, Electrical Engineering, and Civil Engineering will enroll 150 students for the 2019-2020 Academic year. SDSU-G succeeded in recruiting 30% of its Georgian students from the regions, and the socially vulnerable groups. SDSU-G maintains an impressive 40% female student population in its programs [7].

3.2 American STEM degree programs in Georgia

There is considerable data indicating that an active student life positively impacts retention and success of students in demanding fields like STEM. SDSU-G adopted main campus practices for student life by sponsoring orientation events, welcome parties, and student clubs with a focus on a particular discipline or hobby (e.g., Hackathon Club, and Hiking Club). These provided extracurricular opportunities for students. SDSU-G partners with private sector to offer invited speaker series, and organizes field trips to local industries, to environmentally relevant sites, and to arts and culture events. Average cumulative GPA for all three cohorts of SDSU-G students (as of the end of the fall 2018) semester is 3.09. Retention rate for Georgian students is 80%. 88% of the active Cohort 1 students are on target to complete their studies in 4 years. (Note: Attrition rate of international students has been much higher. This was primarily due to English readiness).

In 2018, SDSU-G established a Career Development Center (CDC), aiming to equip students with good self-presentation skills, and market student skills to public and private partners. Through the efforts of Career Development Center established in late 2018, SDSU-G students have already received acceptance from various prestigious universities, both in the U.S., and in Europe. Out of the 51 graduating seniors, 31 have applied for graduate school, and 20 are interested in industry jobs right after graduation, of which 7 have already been employed before graduation [6]. Others have pending offers.

3.3 Georgian Faculty Development and Instruction

As a result of successful “Implementation” and “Evolution” phases, faculty load shifted to Georgian-led instruction sooner than forecasted in the original proposal. A total of 91 Georgian faculty was trained at SDSU. For 2019-2020 AY, absolute majority of the courses taught to the student four subgroups (Freshmen, Sophomore, Junior, Senior) will be transitioned to the Georgian faculty. The originally proposed model of transition is given in Table 1 [5], which assumed that Junior and Senior level courses were going to be still led by SDSU faculty.

<table>
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<tr>
<th>Academic Year</th>
<th>Freshman</th>
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<td>2015-16</td>
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<td>2016-17</td>
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<td>2017-18</td>
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<td>2018-19</td>
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<td>2019-20</td>
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Currently (AY 2018-2019) 70% of all the courses taught at SDSU-G are delivered by the Georgian faculty. The balance of faculty responsibilities are being transitioned to Georgian faculty control, as they gain experience in delivering and evaluating accredited degree programs.

3.4 Facilities Renovations

Through the facility rehabilitation portion of the project, up to 9,000 square meters of classroom and laboratory spaces have been constructed and rehabilitated at Partner University facilities. This includes
the newly constructed 4-story STEM building in partnership with ISU, with a total enclosed space of more than 5000 m² (including a basement parking garage).

3.5 ABET in Georgia

In 2017, MCA Georgia signed a contract with the ABET Foundation, to provide ABET Accreditation Readiness Assessment of STEM Programs for the SDSU-G partner universities. ABET Foundation came for its first visit in fall 2017, and found SDSU-G second track proposal sound and viable [3].

Partner University ABET committee members attended two ABET symposiums in the U.S., for accreditation, assessment and global exchange of best practices in STEM education. The first symposium took place on April 12-13, 2018 in San Diego, California, and it was attended by 15 Georgian colleagues. Upon return from ABET Symposium, ABET Foundation came for its second visit to Tbilisi in April, 2018. Second visit of the Georgian Partner university colleagues to the ABET Symposium, which took place in Dallas, Texas, was on April 10-13, 2019. 13 representatives of three partner universities attended the symposium in Dallas. ABET Foundation is coming for their third and last visit at the end of May 2019. One of the partner universities already got Readiness approval from ABET for two of its programs. They expect to submit their full Self-Study Report to ABET by July 1, 2019, and the ABET site visit is planned/scheduled for fall 2019.

3.6 ACS Certification in Georgia

SDSU-G has made significant progress in preparing TSU for ACS certification. English language Chemistry / Biochemistry program at TSU, modeled after ACS-certified SDSU Chemistry/ Biochemistry program, is already established. Besides an ACS Student Chapter, an ACS Georgia country chapter is being formed. TSU is expected to apply for ACS certification in 2021.

3.7 Program Transitioning and Sustainability

SDSU-G is currently entering the Transition Phase, during and after which SDSU-hosted faculty will serve in an advisory and evaluation role as the Georgian partner institutions pursue independent ABET and ACS accreditation for the modified curricula to be taught directly by the Georgian partner institutions. Students of the five SDSU-G cohorts will continue to be instructed by SDSU-G faculty, and receive their SDSU degree. But after the last SDSU-G cohort graduates, degree-awarding will be transitioned fully to the Georgian institutions, and the “Two-diploma” program will cease to exist. Upon their receipt of ABET/ACS accreditation, during the Transition phase, SDSU-G will continue to provide support to the partner universities, as needed [7]. Government of Georgia provided an additional $11.2 million USD to the project acknowledging the important work of SDSU-G, and hence contributing to sustainability of SDSU-G operations.

Even though, the primary focus of the SDSU-G program was/is on the undergraduate degree process, a number of faculty-to-faculty connections also developed. Joint grant applications between SDSU main campus faculty and the faculty at the partner universities have also evolved. Memoranda of Understanding (MOU) with TSU, ISU, and GTU have been recently renewed (to cover the post-MCC Compact era—till end of September 2023) to reflect the institutions’ mutual commitment to execute collaborative projects, develop courses and academic programs, joint scientific and technical research programs, exchanges of teaching and research personnel, student exchanges, and other mutually beneficial activities that enhance academic, research or technical progress at the universities. The
process of having partner university faculty visits to San Diego has been very helpful in fostering these collaborations, which have also led to successful Fulbright Faculty Exchange Visit applications.

4 CHALLENGES AND RECOMMENDATIONS

Although SDSU-G was prepared for the challenges associated with working with three different partner institutions, it has proven more difficult than expected to coordinate works with three universities, especially considering that two of these have had a long history of existence and different profiles. This led to increased competitiveness between the partner universities over the years. As a result, the three state universities: TSU, ISU, and GTU have not yet fully synchronize with the broader objectives of the project. However, it is hoped that in the near future, the three institutions will form sound partnership with each other, and collectively help popularize STEM in Georgia, and spearhead accreditation and internationalization of all STEM programs in the country. To address this, and other post MCC-Compact issues, a Steering Committee (headed by MCA successor entity, and made up from the three partner university Rectors, representatives of GoG’s finance and education ministries, director of EQE, Dean of SDSU-G, with an observer from the U.S. Embassy PAO) is proposed.

It has also proved a challenge for SDSU-G to identify qualified instructors for training to deliver the approved course material in English language. To mitigate this risk, a strategy has been developed to accelerate faculty development programs with increased mentors from SDSU, and targeting training of young English speaking PhD students of partner universities.

There have been questions regarding the capability of partner universities to adequately maintain and insure the assets (laboratories, equipment, and facilities) built during the MCC Compact. As a part of a sustainability plan, an agreement has been signed between parties that outlines asset transfer requirements. Prior to transferring the assets to the partner universities, PU’s have to build capacity for maintenance and also develop a comprehensive maintenance policy. Asset transfer schedule will be updated on a yearly basis by SDSU. But as the transfer of the assets largely depends on the readiness of the partner universities, handing over of each item will be processed only when SDSU is confident that the specific partner university is capable of maintaining those assets.

There have been hardships associated with the readiness of high school graduates for the American University culture since the current K-12 education system in Georgia does not provide the high school graduates with the minimum competence, and critical thinking skills, needed for their further studies. High schools are not equipped with science laboratories and availability of qualified teachers remains an issue. SDSU-G addressed this problem by providing additional preparatory classes for conditionally admitted students to better prepare them in science/English. SDSU-G organizes orientation events for freshmen to familiarize them with the specifics of American university culture. Orientations include the importance of active student life, continuous education, importance of General Education subjects in STEM curriculum, academic honesty policy, and the multiple tools available to freshmen to help their academic performance.

NAEC exams, and central university placement system, create uncertainties with the admissions, as the exam results are not known until a week before the start of the fall semester. Due to this, and because university entrance exam is being administered only once a year, some of the students conditionally admitted by SDSU are not able to enroll at SDSU-G, after-all due to their NAEC scores.

Tuition for Georgian citizens, in public universities of Georgia is 2,250 GEL (around USD 840) per year. SDSU-G’s annual tuition for Georgian students (USD 7500) is 8 to 9 times higher than the tuition for Georgian public universities. However, this tuition represents a competitive advantage to Georgian private institutions, many of which do not provide accredited degrees. Finally, SDSU main campus typically charges additional fees for student life, library access, and supplies needed for the laboratory intensive courses or degree programs (e.g., Chemistry). In the U.S. campuses, these fees can add up to a substantial sum (at SDSU, $3,000+ per semester). For SDSU-G programs, these fees are incorporated into the tuition, and students are not required to pay additional fees for books, or supplies. Just the SDSU-G annual tuition. Despite this, it has still proven challenging for some Georgian families to cover this amount of tuition (or their portion of the tuition after financial aid). Additional resources were needed to keep students in the program. An affordable student loan program is direly needed.

5 CONCLUSIONS

Overall, SDSU Georgia program was successful in the three main fronts:
• Increasing STEM awareness in Georgia and preparing highly qualified STEM professionals;
• Having ABET/ACS accreditation concepts take root in the partnering public universities;
• Infrastructure upgrades for Georgian teaching environments, and provision of equipment and technology for teaching classrooms and laboratories. Construction of the first new public university STEM building to be constructed in Georgia, since Georgia has gained its independence.

The program will graduate approximately 600 STEM professional till 2023. By this time, it is expected that the Georgian partner universities will have their own ABET accredited STEM programs, in either Georgian or English languages. This will be the ultimate proof of building capacity in STEM fields in Georgia. Our Georgian partner universities will take over the role of graduating students from internationally accredited STEM programs in Georgia. It is expected that two such programs, both in Georgian and English languages, will be accredited by ABET as early as AY 2019-20.

In summary, SDSU-G helped start a transformation in STEM education in the Georgian higher education landscape. New structures are introduced to enhance instructional quality and effectiveness; continuous improvement processes are introduced as part of the international accreditation requirements; university-industry collaboration in the form of events and advisory boards and committees are established. Industry Advisory Boards typically provide faculty visibility on current needs and trends to improve curriculum development. Board members advocate for the university within their own organizations, as well as become engaged with the university and stay educated about the criticality of its STEM undergraduate programs. In addition, these activities offer networking opportunities that enable employers to see the high quality of the program and students, which enhances university-industry connections and leads to increased access to high quality careers after graduation. Above were demonstrated in Georgia, through the example of SDSU-G’s presence and activities in Georgia.

ACKNOWLEDGEMENTS
This project is part of a grant from the Millennium Challenge Corporation and Government of Georgia (GoG). The GoG and the United States Government, acting through the Millennium Challenge Corporation, an independent U.S. government agency with a board chaired by the U.S. Secretary of State, entered into a second five year Millennium Challenge Compact, providing for a grant of up to $140 million USD to advance economic growth and reduce poverty in Georgia. Higher education portion of this grant is about $34.3 million USD with the provision of Degree Accreditation and Institutional Support Initiative for STEM by SDSU in Georgia. This project would not be possible without this generous support. We are grateful to the Government of Georgia for committing an additional $11.2 million to the project to enable post Compact operations. Also, our thanks go to the U.S. Embassy in Tbilisi, and to our numerous private donors for their support. Many colleagues and staff at SDSU main campus, at SDSURF, at our SDSU-G office in Tbilisi, at MCC and MCA, at our partner institutions (TSU, GTU and ISU), and at CIE, believed in the cause of providing US higher education focus to address the needs of the Republic of Georgia in STEM. They put in long hours and worked very hard for the success of the project. Our deep gratitude go to them. The program is built upon the expertise and cooperation between numerous parties to provide a sustainable STEM higher education program in Georgia. We thank them.

REFERENCES
[3] San Diego State University Georgia, “SDSU Georgia ABET PROGRESS REPORT,” April, 2019