



جامعة قطر
QATAR UNIVERSITY

Qatar University Research Magazine

Issue no 12 - December 2019

Mangroves (*Avicennia marina*)



QU Research's Invention Bags
Gold in the International Exhibition
of Inventions of Geneva 2019



Qatar University Press (QU Press)
hosts a press Conference and
Signs Contracts with Six Authors



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Message from the VP

Welcome to the 12th issue of the Qatar University (QU) Research magazine. We are always eager to inform you about our latest research achievements through the pages of this magazine. At Qatar University, we strive to reach excellence in academic research, and for this purpose, we always provide total support to research projects, and encourage students and researchers for the same. In addition, we keep providing sustainable research funding and diverse study programs. It has been our prerogative to strive for continuous refinement and progress in our graduate programs to align with the strategic goals of Qatar University 2018-2022.

At QU Research magazine, we have a mission to highlight the results of our significant research work. In this issue, these include the patent of an electrical system that purifies the water produced during oil extraction process. If you are interested in the marine environment, you will find very interesting details about the mangrove trees along the Qatari shores, and about their major role in preserving the marine life and environment in Qatar.

We, at Qatar University, have a strong focus on local and international partnerships and cooperation, an example of which was demonstrated by a team of researchers from the College of Medicine and the College of Health Sciences and Biomedical Research Center at Qatar University. The team discovered the genetic track that leads to the preliminary stages of sudden heart attack. Their research was conducted in cooperation with Sidra Medical and Research Center in Qatar, the National Research Center "Demokritos" in Greece, and Cardiff University in the United Kingdom.

In this issue, we also highlight some of our very interesting events

and activities. These include the announcement of the guest workers' welfare index by the Social and Economic Survey Research Institute (SESRI) at Qatar University, which was done on 1 May 2019. In addition, the Department of English Literature and Linguistics is currently participating in some research projects that explore the psychic fundamentals of the structure of Arabic language, and other languages. These are followed by the startup of Empower Generations Consortium for Building National Capacities in Life Sciences and Healthcare.

To further enhance partnerships, a group of researchers from Qatar University and some government institutes, have gathered to discuss the results of most recent researches, and to give their recommendations to decision makers on how the Qatari economy could be transformed into a knowledge-based economy. This issue focuses on the achievements of Qatar University Press, highlighting the first of its press conferences in which the Press signed contracts with six authors.

Through the pages of this issue, you will be able to have a thorough idea about the role of some of the most significant offices in Qatar University under the umbrella of Research and Graduate Studies. Such as the Learning Support Unit at the Office of Graduate Studies, which supports graduate students in developing their skills in academic research.

You will also read about some significant researches done by students of Qatar University at the undergraduate level, who were fully funded and selected to represent QU at the Second World Congress on Undergraduate Research, which took place in May 2019 at the University of Oldenburg in Germany.

During this trip, Kamilia Zubair, a student of QU won the award



of research excellence in environmental studies.

The College of Engineering has also its share of achievements. The Space Syntax committee has allowed the Department of Architecture and Urban Planning (DAUP) the opportunity to host the 14th Congress SSS14 in 2023 in Doha, in addition to developing a smart transportation system that improves traffic safety and efficiency.

In addition, you will find more information about the device Marine Menshal, which received a gold medal in the International Exhibition of Inventions of Geneva 2019, along with much other news, many articles and achievements, which are the fruitful work of students and researchers at Qatar University.

At Qatar University, we aim to achieve excellence in academic research, and serve the national research priorities, in order to realize the Qatar vision 2030. For this purpose, I would like to invite everyone who is interested in different fields of research to attend the Qatar University Annual Research Forum and Exhibition 2020, with the theme: "University of the Future: Re-Imagining Research and Higher Education".

Wishing you a pleasant reading!

Prof. Mariam Al-Maadeed

Vice President for Research and Graduate Studies at Qatar University



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General Supervision

Prof. Mariam Al-Maadeed

Editor-in-Chief

Amani Ahmad Othman

Senior Editor

Dr. Nabil Mohamed Darwish

Editors

Noora Ahmed Al-Fardi

Deena Ahmad Alfalasi

Layal Safa Mansour

Design

Gasan Al bateeri

Text Review

Prof. Sultan Muhesen

Revision & Proofreading

Qatar University Press



Internal Grants Awards

International Symposium on Sociology and the Question of Indigenization	5
Office of Graduate Studies holds Orientation Day for Fall 2019	6
QU organizes Summer Program for Research Training	7
DAUP-CENG-QU Awarded 14th International Space Syntax Symposium ...	10
The Guest Workers' Welfare Index (GWWI) Assessing and tracking the welfare of migrants in Qatar	12



QU Research's invention bags gold in the International Exhibition of Inventions of Geneva 2019

QU Patents 2019	16
Qatar's First ECMO Simulator: When High-Fidelity Meets High Affordability	18
QU Heart Research Reveals How a Genetic Defect Leads to Sudden Cardiac Arrest Giving Hope for New Therapies	22
QTTSC studies Development of Innovative Intelligent Transportation System Solutions to Improve the Safety and Efficiency of Traffic Operations	24
QU Faculty Member's Research Draws International Acclaim	26



Career Path to Animal Research: A Success Story and Achievement	27
Qatar University students attend the Second World Congress on Undergraduate Research	28
Patent Application of New Electrocoagulation System for Produced Water Treatment	31

Research issues

33



Mangroves (*Avicenna marina*): A Key and Invaluable Member of Qatar's Marine Environment

Impact of ICTs diffusion on environmental quality in Qatar..... 36

Research Articles

39



From Oil and Gas to Knowledge: Transforming Qatar into a Knowledge-Based Economy

Global Mental Health: A Call for Action!	42
Novel Nanocrystalline Materials with Thermal Stability Near Their Melting Point	44
Potentials, Challenges and Opportunities for Tourism Development in Qatar.....	45
Experimental Linguistics and the Structure of Arabic	48

Reports

50



Cyber Week 2019 27-31 October, 2019-3rd Edition

Empower Generations Consortium For National Capacity in Life Sciences	52
Annual Research Forum & Exhibition 2019	54
Qatar University's Central Lab Unit (CLU)	58
Learning Support in the Office of Graduate Studies	60
Qatar University Press (QU Press) Hosts a Press Conference and Signs Contracts With Six Authors	62

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Internal Grants Awards

The Office of Research Support in the Research and Graduate Studies Sector of Qatar University organized the Internal Grant award announcement ceremony on Monday 2nd of December 2019 in the Presence of Prof. Mariam Al-Maadeed Vice President for Research and Graduate Studies, Faculty members, Associate Deans for research, Centers' Directors, Researchers, Industry stakeholders and a delegation from the Japanese Embassy.

At the event Mr. Toshiaki Hato, Director of Marubeni Doha, expressed the importance of collaboration with QU to strengthen the bond between Qatar and Japan on Education, Culture and Research. He announced the introduction of two new programs sponsored by Marubeni: Concept To Prototype (CTP), a specific program which hopes to achieve the best fundamental research outcomes and leverage them to the next level of prototyping and exploitation; and the Qatar-Japan Research Collaboration (QJRC) Program, a collaboration program between QU and eleven Japanese Universities. The addition of these programs and the continuity of previous ones has seen an impressive increase on the number of new grants at Qatar University with 116 new grants. (Refer to Figure 1)

At the event, the Office of Research Support previewed the statistics of the grants. It was shown that the College of Arts and Science (CAS) and the Colleges of Engineering (CENG) lead the way by collectively claiming almost up to 60 percent of the total grants. The College of Business & Economics (CBE) increased its awarded grants mainly on the newly introduced CTP program. The College of Sharia & Islamic Studies (CSIS) received its first grants through the Collaborative Grants program. (Refer to Figure 2) International Collaboration through the International Research Collaboration Co-Fund (IRCC) has heavily benefited all the



Honoring Mr. Toshiaki Hato, Director of Marubeni, Doha.

Research Pillars of Qatar University, consisting of; Energy and Environment, Health and Biomedical Sciences, Information and Communication Technologies and Social Sciences and Humanities. Similarly, the new QJRC and CTP programs were supported by the increase of output in each sector, especially the Information and Communication Technologies and

Energy and Environment sectors.

This year, through the IRCC, Qatar University initiated joint projects with Sultan Qaboos University as a part of the Qatar-Oman Research Collaboration (QORC). Together the two Universities successfully co-funded 6 projects. The collaborations will further strengthen ties with Sultan Qaboos University, which is seen as a strategic regional partner.

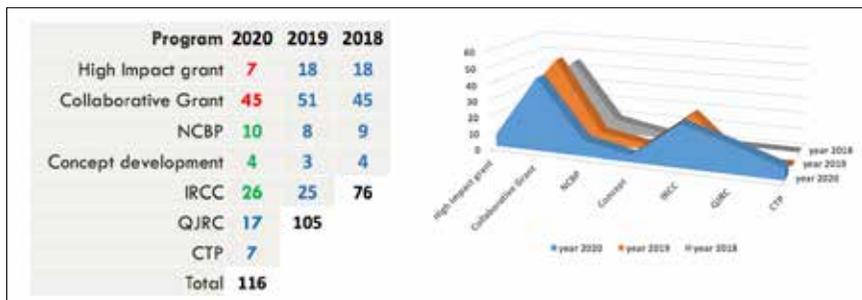


Figure 1

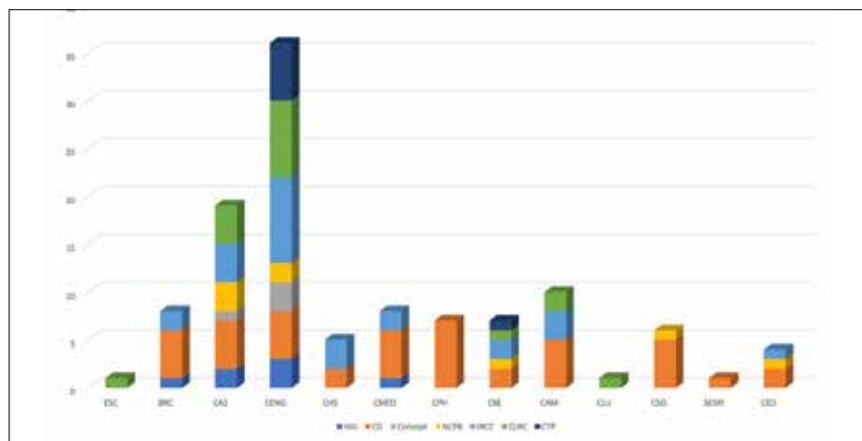


Figure 2

International Symposium on Sociology and the Question of Indigenization



Part of the symposium attendees

Organizer: Ibn Khaldon Centre for Humanities and Social Sciences - Qatar University
Date: Saturday October 26 2019
Venue: Reception Hall, Main Administration Building - Qatar University

The Western cognitive model forms the basis of human and social knowledge in its current structure. The social sciences mostly emanate from the Western cognitive models and discuss different social issues according to the contexts of Western societies. This led to a gap between the theoretical structure of social sciences and the distinct realities of Arab and Muslim societies. Sociology in the Arab and Islamic world is not an exception to this phenomenon; it is also a direct extension of the Western cognitive model foundations and contexts. This implies the need to bridge the gap that exists between theoretical frameworks of so-called “social knowledge” and the Arab and Muslim societal realities.

The International Symposium on Sociology and the Question of Indigenization comes within this framework of renovation and indigenization of the humanities and social sciences adopted by Ibn Khaldon Centre for Humanities and Social Sciences at Qatar University,

and aimed at reshaping theoretical structures to be qualified to ask Arab reality related-questions, while ensuring the continuity of the interactive critical dialogues with the scientific achievements of all human societies.

The symposium addressed four important themes; the first theme, discusses foundations, conditions and requirements of indigenization of Sociology in the Arab Region, and tackles the epistemological problems related to cognitive requirements and scientific foundations as well as methodological, institutional and other conditions that could serve in the indigenization of sociology process. This is in addition to obstacles and challenges that deter indigenization of sociology process as well as transforming large quantities of the empirical studies into governing theoretical structures that would establish sociology in Arab/Islamic context.

Given the importance of highlighting the previous experiences of indigenization of sociology, the second theme of the symposium presents some models of the indigenization of sociology in various contexts such as Iran, Africa, Turkey and India, and examines the issues encountered these experiences and provides some critical evaluative readings.

It is an important experience of so-called “Islamic sociology”, considering the various scientific efforts that have tried to establish this field, looking for its legitimacy in understanding, interpretation and prediction to the reality of the Islamic society. The third theme addresses questions about the legitimacy of this field and foundations that were the base of it as well as the value of its scientific accumulations and achievements in the general theory of sociology.

The last theme up the potentiality of establishing a sociology for the gulf region, and deals with this potentiality in two levels: cognitive level through the possible subjects, methodologies, scientific value and forms of overlapping with sociology in general and with the sociology in the Arab world in particular; and procedurally through the solutions that can be offered by it to the social dilemmas in the gulf region.

Of note, the symposium graced by the presence of the keynote speaker Prof. Dr. Syed Farid Alatas, and other distinguished scholars from different countries in the Arab and Islamic world. It concludes with general remarks and recommendations, which included the necessity of constant networking between scholars interested in the indigenization of sociology in the Arab and Islamic world.

Office of Graduate Studies Holds Orientation Day for Fall 2019

The Orientation Day is one of the most important events in which students meet with the administrative and teaching staff to shed more light on their duties and responsibilities during their studies at the Qatar University. Therefore, on Saturday 24 August 2019, the Office of Graduate Studies held the orientation day for new graduate students at Ibn Khaldun Hall. Nearly 400 students in addition to several faculty members related to graduate studies attended the event.

The event started with the Dean of Graduate studies, Prof. Ahmed Elzatahry, explaining the role of his office in the service of students through its various sections such as student and academic affairs, academic support affairs. The dean compared studies at the undergraduate and graduate levels, especially since most of the students have work and family pressures, he gave a set of useful tips for students in this case.



Graduate students during the orientation

The Assistant Dean for Student Affairs, Ms. Ghada Alkuwari, also talked in detail about the web page of the Office of Graduate Studies and the most important policies that directly affect students' life such as attendance, course repeating, the maximum period of study, number of semesters after the student can

withdraw from during the course period. He also talked about the system of warning and academic probation and its effect in case of exceeding the limit of warnings and the procedure to apply for re-admission.

The Assistant Dean for Academic Support, Dr. Mary Newsome, provided a briefing on her role in supporting students by explaining the events of the tad such as tad Talks and the tad camp. The audience was also briefed on the social media activities of the office to facilitate communication and response to inquiries. The Student Services Department participated for in this event for the first time by providing information on how to obtain the university card and the place and dates of receipt of textbooks and services provided by this section, such as the locker services, lost and found services and others.

For more information, please visit the Research and Graduate Studies website: <http://www.qu.edu.qa/research>



Faculty attendees at the event

QU Organizes Summer Program for Research Training



College deans, directors of research centers and part of the participants in the summer training program

Qatar University aims to prepare high-qualified graduates as per its message and strategic plan of building productive capabilities and self-development of students. QU aspires to attract efficient researchers and improve their skills through practical training in highly professional research labs with the assistance of a competent research team for the supervising the researchers.

The Summer Program for Research Training witnessed the participation of the following centers: Biomedical Research Center, Center for Advanced Materials, Central Lab Unit, Environmental Science Center, Laboratory Animal Research Center and Social and Economic Survey Institute. The number of trainees in the program reached nearly 100, which consisted students from various faculties of Qatar University as of June 2019 to August 2019. Trainees are instructed by a specialized

research team composed of researchers, assistants and laboratory technicians who have superior training skills in the use of scientific instruments and techniques. The applicants joined the official summer training site of each center, following the announcement via e-mail and social media platforms of Qatar University.

Dr. Mariam Al-Maadeed, Vice President for Research and Graduate Studies, said that the Summer Program for Research Training provided an open platform for exchanging information among students, researchers and technicians, and contributed to building critical thinking and innovation to meet the demands of the local and global labor market.

Biomedical Research Center:

The organization of Summer Training Program in Biomedical Research Center Between 11-20 June 2019 enhanced

the scientific and practical skills of students in the field of research in medical sciences. The students belonged to the following specialties: six female trainees from biomedical sciences department and one female trainee from biology department. In addition, the program has been assigned for final year students at medical assembly faculties and postgraduate students who look forward to joining biomedical research field.

Trainees received the following outputs from the Summer Training Program:

Identify safety and security instructions for working in the laboratories.

Skills necessary for using basic and assistive devices in medical research laboratories.

Identification of some techniques used in research in different biological fields, such as Genome,

Microbiology, Virology and Metabolic disorders department, by which some chronic diseases, such as diabetes and cardiovascular disease are studied with using research samples like zebra fish and chicken embryos.

The students were divided into three groups, each group was trained in a section of the center for 3 days, and after completion, the sections were exchanged through groups until all groups were trained in all departments. The trainees were evaluated based on the information they received during the training period by conducting a final test, where they obtained high grades, proving the extent of the benefit they received from this program where three of the eight students received an 'excellent grade', and four received 'a very good grade', while one student received 'a good grade'.

Central Lab Unit:

Training programs in Central Lab Unit focus on directing students to methods that help them take benefit from analytical services provided by the Unit to the students in various fields while their stay in the university, together with the way of managing their research projects whether before or after graduation and in all different applied work areas.

Practical training for making chemical analysis coupled with presenting focused theoretical summaries may help students understand the nature of work from a technical and practical point of view and the method of analyzing, presenting and interpreting outcomes in a scientific manner.

Sixty-one students were enrolled in the Summer Training initiative of the Unit, distributed among five training programs. The duration of each program was five days. The Summer Training Program was held as of July 7 to August 22, 2019. Training was initiated in basics of atomic and

molecular spectroscopy in terms of presentation of instruments and techniques used in analysis, methods of developing and preparing samples, methods of preparing standard chemicals used, as well as quality control of such an analysis. The training on ICPMS, ICPOES, FTIR, UV / VIS and RAMAN started from the stage of sample preparation and measurement methods to the correct interpretation and writing of the results, with a focus on students practicing the different practical stages of these analysis methods. A detailed explanation was provided to students on the topics of health and safety in chemical laboratories.

Summer Program for Research Training provided to the students of central laboratories unit 2019 included five training programs as follows:

Atomic and molecular spectroscopy: Basics, instruments and techniques.

Electronic microscope in both types: Scanning transmission, basics, preparation of samples and

applications.

Nuclear magnetic resonance: Basic theories, analysis of spectrum and industrial applications.

Techniques of chemical analysis: Basics, instruments and applications.

Techniques of Chromatographic analysis in different types: Basics, instruments and applications.

Environmental Science Center:

The center started providing the Summer Program for research training to both male and female students of Qatar University as of 2014. The most important goal of the center was to make the students, together with the Center staff acquire the practical experience, as it would help them in determining their professional goals more clearly. In addition, it provided scientific and practical communication chances to students, since it may benefit them in planning graduate projects and help them follow up on their graduate studies. Moreover, this path provides more opportunities



Prof. Mariam Al-Maadeed honors participants from the research centers

for the development of necessary skills for making specialized research in specific field.

Number of trainees who attended the program in the summer of 2019 reached twenty. The duration of the summer program was 3-4 weeks. Among projects completed by the students in the summer program are the following: Analysis of biological samples at benthic sediments and classification of fishes, analysis of mercury in soil, water and fish samples by (Acid Digestion) using the device (CVAAS), mineral analysis ay soil and fish samples by (Acid Digestion) using device (ICP-OES), analysis of total organic carbon and overall nitrogen in water samples by using (Catalytic Combustion Analyzer), analysis of hydrocarbons by using the device (Gas Chromatography/ FID), analysis of sediment and distribution of the particle size by using device (Laser diffraction) and analysis of laboratory measurements and nutrients in water and soil samples.

Social and Economic Survey Institute:

Students were trained on different research tasks, including development of questionnaire as well as prepare, coordinate and edit reports and review articles within the Social and Economic Survey Institute. Trainees made unique research experiments regarding data collection, surveyed public opinion and its potential use. Three students of Qatar University joined the Summer Training Program of 2019. Two students have been trained on research management in the institute and one student in the management of policies for duties of research assistant and administrative tasks of the institute. Training continued for forty-five days as of June 20 until August 15, 2019.

Laboratory Animal Research Center:

Summer Program for Research



Trainees in the lab

Training in Laboratory Animal Research Center include the following:

Basics of animal husbandry, movement within animal farms, cleaning and sterilization processes and appropriate way for rats' treatment.

Basic activities for animal husbandry, examine its health, cages change, oral injection, animal anatomy, basic procedures for blood sampling, serum separation from blood samples, organ removal from mice and identification of diseased animals.

Basic principles for using instruments, importance of sampling, preparation and storage of materials and disposal of waste.

Procedures of safety necessary in handling liquid nitrogen.

Storage process by cooling.

Introduction to molecular biology techniques.

Theoretical explanation of analysis process by using (ELISA) technique.

Summer Training 2019 witnessed the participation of three students between the period from June 23 to July 18.

Center for Advanced Materials:

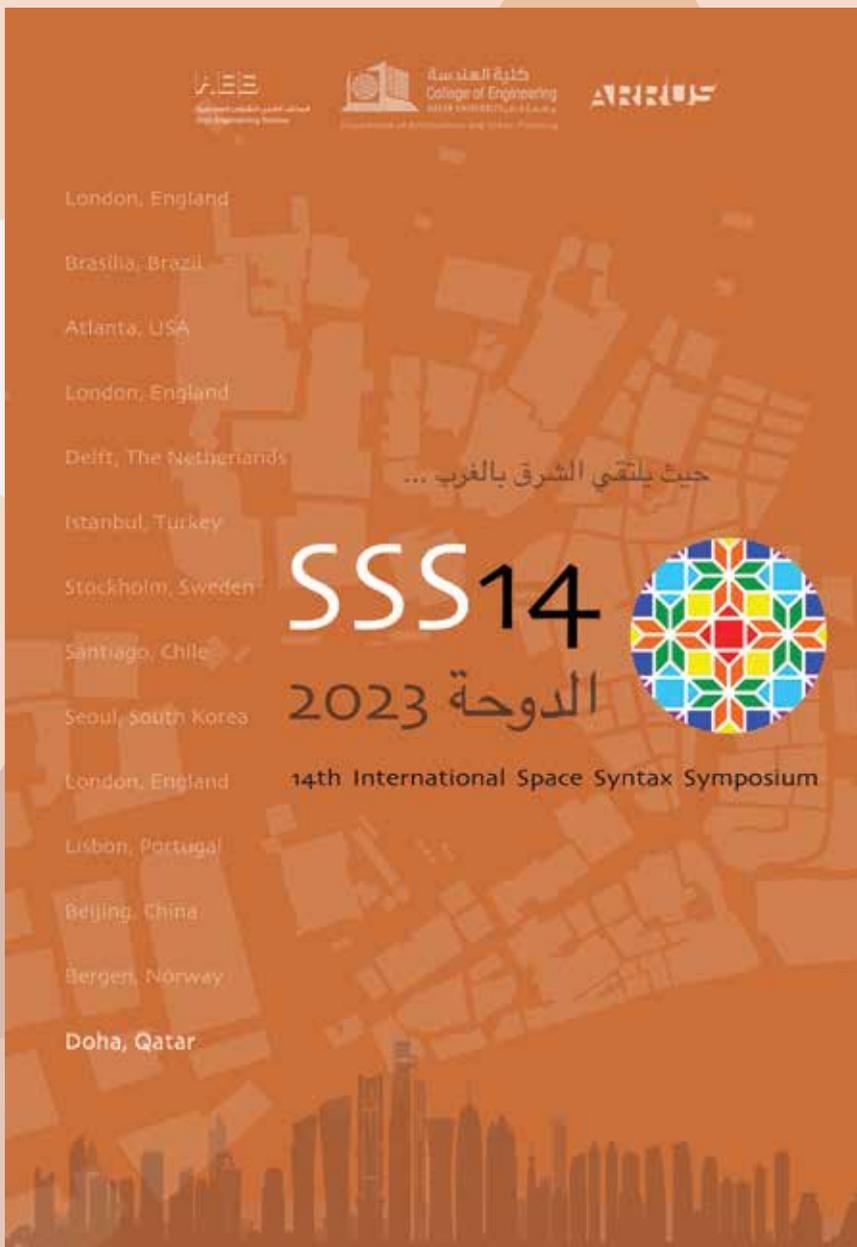
Center for Advanced Materials

aimed for the rehabilitation of students and development of their research skills through the Summer Training Program in order to ensure the quality and competence of research, under the supervision of specialized researchers in order to meet the demands of the industry field in Qatar.

Students have worked on several research projects, including: "Developing smart protective coatings to protect from corrosion in the Oil and Gas Industry, high voltage cathode materials (LIBs) that are well suited to Qatar's environment," thioline flexible polymer membranes for efficient Carbon Dioxide separation from Nitrogen and Methane gases, the development of the second-generation semiconductor-based next-generation flexible, ultra-thin and anti-allergy chemical sensors for the oil and gas industry, new corrosion inhibitors of steel in concrete, non-destructive testing of metals and concrete constructions and smart Ion-Exchange Resins antifouling for wastewater treatment."

It is worth mentioning that the Summer Program for Research Training witnessed the participation of thirteen students in the Center for Advanced Materials within the period from June 9 to July 5, 2019.

DAUP-CENG-QU Awarded 14th International Space Syntax Symposium



In July, the International Space Syntax Steering Committee awarded hosting of the 14th International Space Syntax Symposium (SSS14) in 2023 to the Department of Architecture and Urban Planning (DAUP), College of Engineering (CENG) at Qatar University (QU).

Founded by Bill Hillier, Julienne Hanson, John Peponis, Alan Penn and many others in the late 1970s/early 1980s at University College London, space syntax is a worldwide research program dedicated to investigating the built environment based on the objective, analytical techniques of network science. Cambridge University Press (CUP) and Routledge have published several notable titles based on space syntax theory and



Dr. Mark David Major (left) and Heba O. Tannous present during the recent 12th International Space Syntax Symposium (8-12 July 2019) hosted by Beijing Jiaotong University in Beijing, China

research including *The Social Logic of Space* (CUP: Hillier and Hanson, 1984), *Space is the Machine* (CUP: Hillier, 1996), *Decoding Houses and Homes* (CUP: Hanson, 1998) and *The Syntax of City Space* (Routledge: Major, 2018).

Now in its third decade, International Space Syntax Symposia is a biennial conference/workshop event attended by academics, practitioners, researchers and students from around the world. University College London hosted the 1st International Space Syntax Symposium in 1997. In the recently held SSS12 event, hosted by Beijing Jiaotong University in Beijing, China, there were approximately 300 attendees from more than 30 countries. Western Norway University will host SSS13 in Bergen, Norway during the summer of year 2021.

Dr. Mark David Major, AICP, CNU-A, Assistant Professor of Architecture and Urban Design at DAUP-CENG and Chair of the SSS14 Organizing Committee, Heba O. Tannous, DAUP-CENG Research Assistant and SSS14 Symposium Organizer

and Deepthi John, Architect at ARRUS International WLL in Doha, represented the DAUP-CENG-QU SSS14 conference bid at SSS12 in Beijing, China. Dr. Major is internationally-recognized as the founder of Space Syntax Symposia. The DAUP-CENG-QU bid for SSS14 withstood strong competition from universities in Cyprus and Malaysia to secure unanimous consent from the international steering committee. There were also four papers/presentations affiliated with DAUP-CENG and ARRUS presented in Beijing and published in the SSS12 conference proceedings.

SSS14 represents a tremendous opportunity to showcase academic research and industry design innovations using space syntax in the State of Qatar and MENA region in the immediate afterglow of the 2022 World Cup. The State of Qatar and its notable structures/places such as Souq Waqif, Souq Wakrah, Msheireb Downtown Doha, Museum of Islamic Art, Qatar National Museum, Qatar National Library, World Cup 2022 stadia and much more will feature in pre and post-conference mobile workshops

available to symposium attendees. The local symposium organizing committee and international steering committee are finalizing dates, but SSS14 is tentatively scheduled to occur approximately three weeks after the 2022 World Cup Final in early January 2023.

The SSS14 Organizing Committee includes: Dr. Mark David Major, DAUP-CENG-QU, SSS14 Organizing Committee Chair; Dr. Fodil Fadli, DAUP Head; DAUP RA Heba O. Tannous, Symposium Organizer; DAUP TA Revina Merry Abraham; DAUP TA Sultana Al-Nabet; Maryam Al-Nuaimi, President of QU-AIAS (Qatar University-American Institute of Architecture Students); former DAUP graduate student Heba Saleh G Elgahani; former DAUP undergraduate Dina Moataz Nazmy Saleh, GHD Global (Industry Representative); Architect Velina Mirincheva, ARRUS International WLL; Architect, Deepthi John, ARRUS International WLL and Dr. Akkelies van Nes, SSS13 Representative (Western Norway University) and Architect Ibrahim Jaidah, Arab Engineering Bureau, Honorary Chair.

The Guest Workers' Welfare Index (GWWI) Assessing and Tracking the Welfare of Migrants in Qatar



While participating researchers presented their research posters, Dr. Hassan Al-Derham, President of Qatar University, on his left Dr. Darwish H Al-Emadi, Chief Strategy and Development Officer and Prof. Mariam Al-Maadeed, Vice President for Research and Graduate Studies, with Dr. Hassan Al-Sayed, Director of Social and Economic Survey Research Institute. To the right, His Excellency Dr. Hamad Abdel Aziz Al-Kuwari, a State Minister, the former Minister of Culture, and His Excellency Dr. Saleh bin Mohammad Al Nabit, President of the Planning and Statistics Authority, and His Excellency Dr. Ibrahim Al-Naimi, Undersecretary of the Ministry of Education and Higher Education, and finally Major General Hamad Al-Marri, Former director of the Centre for Strategic Studies (SSC) of the Qatari Armed Forces.

The Social and Economic Survey Research Institute (SESRI) at Qatar University (QU), held an event on May 1, 2019 to present the results of the second wave of Guest Workers' Welfare Index (GWWI). The index is used to measure and track the welfare of blue-collared guest workers in Qatar. Attendees of the event included Dr. Hassan Al-Derham, President of Qatar University, Dr. Hassan Al-Sayed, Director of SESRI, and representatives of the Ministry of Administrative Development, Labor and Social Affairs as well as other distinguished guests from government, non-governmental organizations and private sector.

The Guest Workers' Welfare Index (GWWI) is a multi-dimensional comprehensive tool based on survey data, developed by the Social and Economic Survey Research Institute (SESRI) at Qatar University. It aims to capture

a comprehensive view of the living and working conditions of blue-collared guest workers in Qatar and track these conditions over time. Conducted annually, it also covers health, contract issues, and overall worker satisfaction. By combining the responses to questions on these topics from the workers themselves, the goal is to have an objective and reliable index, which will reflect the existing conditions of workers in Qatar as well as changes to their welfare over time, resulting from policy or legislative changes. The results of the study are based on a nationally representative sample of migrant workers living in labor camps in Qatar.

Although Qatar continues to develop and implement major reforms to its labor laws, until now, there was no unique tool based on survey data to evaluate the impact of the government's policies on guest workers.

SESRI initiated this project with a closed workshop in January 2016 with international scholars, stakeholders, and policymakers, in order to ensure that the index is comprehensive, unbiased, transparent, and accurate in its portrayal of the living and working conditions of guest workers living in Qatar currently. In 2017, SESRI completed the first-ever effort to measure and track over time the welfare of blue-collared guest workers in Qatar. The index consisted of six sub-indices: Mental Health, Physical Health, Working Conditions, Living Conditions, Satisfaction, and Contracts.

For Qatar, the rationale for a Guest Workers Welfare Index is twofold. First, the welfare of migrant laborers around the world has received significant attention from the global media and scholarly community. In the Gulf, much of this attention has



The President of Qatar University and a delegation of senior statesmen while discussing the results of the 2nd wave of the Guest Workers' Welfare Index (GWWI) with Dr. Hassan Al-Sayed, Director of Social and Economic Survey Research Institute, and the participant researchers

been directed towards Qatar, especially since being announced as the host of the FIFA 2022 World Cup. However, most of the analyses of the concerns faced by workers have not been based on unbiased, quantitative and qualitative measurements that can be generalized to the overall migrant labor population. Reliable data are needed to properly assess the issues surrounding worker welfare in aggregate, to identify domains where welfare is lower or higher, and ultimately, to address those issues in most need of improvement.

Second, it is important to note as well, that there have been some changes made to the labor system in Qatar; for instance, in October 2015, Qatar updated its labor law (Number 21 on the Entry Exit and Residency of Foreign Nationals) to make it easier for guest workers to change employers or to leave the country. Yet, absent of any consistent or independent measurements, there is no way to gauge whether these changes have had any real impact on the lives of the workers. Thus, SESRI's goal here is to choose indicators that will accurately measure the welfare of guest workers in Qatar and combine them into a composite index, so that can be used as

a reliable tool for developing policy recommendations and comprehensive, temporal and objective monitoring of the situation.

The results presented below are from the second wave of the GWWI, which surveyed 1,028 blue-collared guest workers in Qatar, residing in different labor camps. As in the first wave (2017), the 2018 survey was conducted during the month of April, and evaluated several aspects of working and living conditions of these workers, including safety and security at working sites and living compounds, human rights and labor rights, finance and remittances, as well as their treatment by employers. By examining the responses from the workers themselves, the goal is to have an objective and reliable index which reflects the actual conditions of workers in Qatar and which can measure changes in these conditions over time.

Overall, on a scale from 0 to 100, where 0 indicates the lowest welfare and 100 indicates the maximum welfare for guest workers, the 2018 GWWI is evaluated at 81, an improvement from the score of 75 reported in 2017. This index score is the average score of the composite scores created for each of the

six sub-indices based on the mean of the items that had their primary loadings on each factor. The sub-indices as mentioned before consist of the following factors: Mental Health, Physical Health, Working Conditions, Living Conditions, Satisfaction, and Contracts. Internal consistency for each of the factors (scales) was examined using Cronbach's Alpha. While the sub-indices of greatest improvement in 2018 are Contracts, Working Conditions, and Satisfaction, they remain the indicators with overall lowest ratings, hence requiring particular attention and further investigation. Between the two waves (2017 and 2018), Contracts as a factor registered an impressive jump, from 61 to 71 on the same scale from zero to 100. However, in both waves, it received the lowest rating among the factors of the Index. This indicates that employers need to improve understanding and convey information about migrant workers' contracts, as well as to honour contracts in order to raise the general welfare of the guest workers in Qatar.

The third wave of the GWWI was conducted in April-May 2019, and currently the research team is working on the data analysis and preparing the study outcomes.



QU Research's Invention Bags Gold in the International Exhibition of Inventions of Geneva 2019

Dr. Ibrahim Abdullatif Al-Maslamani, associate professor in Marine Biology Department, Qatar University and Consultant of the University Vice President for Research and Graduate Studies, won a gold award in the International Exhibition of Inventions in Geneva 2019 for the invention of a fisher's tool called Menshal. The tool can be instrumental in helping to protect Qatar's environment as well as diving spots.

In addition, it aims to decrease the impact of fishing traps on marine habitats (fish stocks represent the main source of protein for Qatari population) coupled with achieving Qatar vision 2030 for sustainable development, food security and maintaining biological diversity. The Geneva exhibition witnessed the participation of developed countries, such as Japan and European countries as well as more than 800 inventors from different parts of the world. Accordingly, obtaining 4 gold and 1 silver awards by Qatar is a considerable achievement to be added to its record of achievements.

Menshal is a tool used by fishers to withdraw "the Ghargoor" which is a box made from wires in half-oval form as illustrated in the figure (1).

The Menshal is used for extracting

those traps “Ghargoors” from the bottom of the sea as can be seen in figure (2) as being the old Menshal.

The Menshal is operated by placing it at the bottom of the sea in order to look for traps and extracting them to the surface on a cliff together with destroying the bottom of the sea including its creatures in general. It is worth mentioning here that at an average, a hundred operations done by the fishers on a daily basis in order to look for the traps, result in destruction of diving areas and coral reefs. In addition, it makes the fish stocks and benthic organisms lose shelter, giving rise to decreasing fish stocks.

Moreover, The New Menshal, the invention, works smoothly, as shown in figure (3), hence reducing contact to the bottom of the sea, hence decreasing the probability of any destruction to the sea bottom. When it is placed on the sea bottom, it does not drill like the old Menshal device. Furthermore, it is mobile single-headed and upon catching the rope, it is hardly to be lost, therefore it reduces any destruction to marine environment. The device may restore the rope in all types of topography and its weight can be controlled as well. Menshal is also a low-cost solution.

Bagging of a gold award for such an invention can be deemed a motivation to the development of Menshal, since it has already



Dr. Ibrahim Al- Maslamani is receiving the golden award in the International Exhibition of Inventions in Geneva 2019

been used by fishers in Al-Khor, Al-Wakrah and Ar-Ru’ays and impressed them and proved that it is environment friendly.

The idea of the New Menshal was constituted by the research made by Dr. Al-Maslamani and it was observed that Qatar’s marine environment and places where pearl diving takes place had been affected by the wrong use of old tools or Menshal by fishers. This resulted in great damage to the environment, especially the pearl oyster, considered as one of the most important marine species. In the coming period, the focus will be on manufacturing Menshal machines and distributing the same to the fishers in Qatar, as It has been confirmed to manufacture such device to the Ministry Municipality and Environment, in order to be used in Qatari national water and made available to fishers in the country. In addition, it will be distributed to

fishers in other Gulf States in the near future, as very soon Qatar University aims to enter into an agreement with the Ministry of Municipality and Environment for dispensing Menshal devices to fishers.

Dr. Ibrahim Abdullatif obtained a Platinum Medal for scientific excellence in 2007, and has specialization in studying Qatar’s water resources, researches amounting to 4, on Qatar’s marine environment. In addition, he has the distinction of being a discoverer. Some examples include discovery of Al-Khor prawns and maple as well as various research and external projects, in particular the projects funded by Qatar National Research Fund. Moreover, he has 9 research projects to his name, and most of them deal with Qatar’s environment and flora and fauna, such as the study of the Avicennia plant and the study of coral reef and fish stocks.



figure 1. Al Ghargoor



figure 2. The Old Menshal



figure 3. The New Menshal

QU Patents 2019



Dr. Tamer Khattab



Dr. Amr Mohamed



Dr. Tarek Elfouly



Dr. Ahmed Badawy

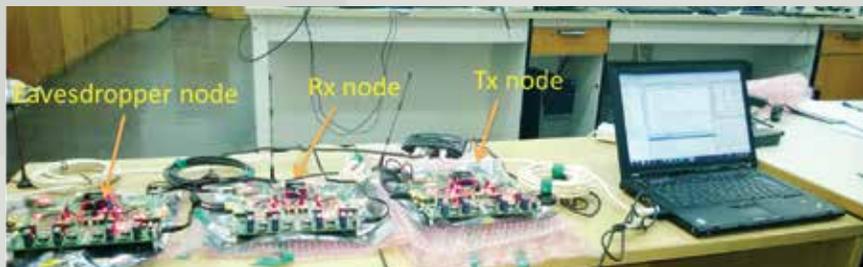
The Office of Innovation and Intellectual Property, Qatar University, announces the latest patents issued to researchers from Qatar University. It should be noted that the number of patents owned by the university has significantly increased since the establishment of the Office in 2017 to reach 27 patents, the vast majority of which have been issued by the US Patent and Trademark Office. The Office of Innovation and Intellectual Property continues its efforts to spread the culture and knowledge of intellectual property and the importance of its protection at the local and international levels.»

This article shed lights on some of these patents that have been achieved in 2019:

Patent title: Method for Generating a Secret Key for Encrypted Wireless Communications

Inventors from Qatar

University: Ahmed Badawy, Tamer Khattab, Tarek Elfouly, and Amr Mohamed
US Patent #: 10404457



Summary:

The invention is regarding a new method for generating a secret key for encrypting wireless communications at the physical layer, exploiting wireless channel randomness between two nodes. The importance of such the new method comes from the significant improvement on the efficiency of generating such keys, which will have enormous implications on communication systems that require source of randomness to generate secret

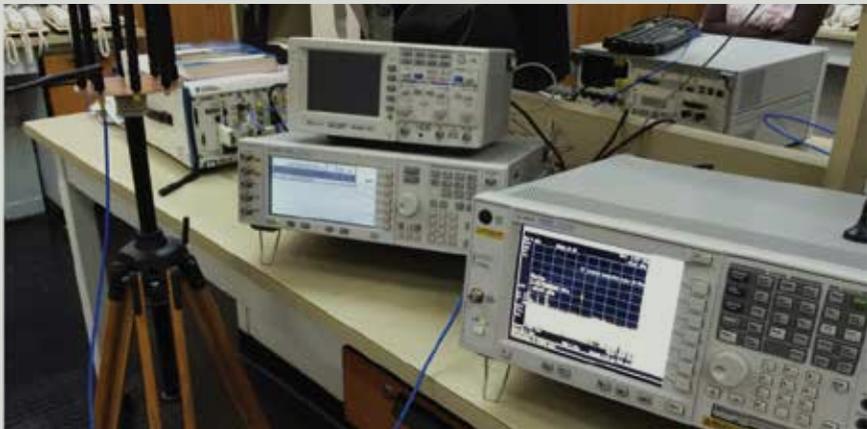
keys with high level of secrecy, and exclusiveness amongst communicating nodes. The method may also be used for other applications such as cloud storage, and radio frequency fingerprinting.

The method is based on reference signals exchanged by the two nodes, which are used to form a channel estimate, including gain and phase. The gain and phase estimates are then compared to respective threshold values, and locations

(i.e., x-axis points or time stamps) where gain and phase exceeding the threshold values are stored in vectors. The moving differences between gain locations and phase locations at adjacent sampling times define secondary random processes. The moving difference values are quantized and converted to bit streams, which are then concatenated to generate the secret key. Measures are provided to reduce parity errors, thereby reducing the bit mismatch rate (BMR).

Patent title: Method and Apparatus for Simple Angle of Arrival Estimation

Inventors from Qatar University: Ahmed Badawy, Tamer Khattab, Tarek Elfouly, and Amr Mohamed
US Patent #: 10386447



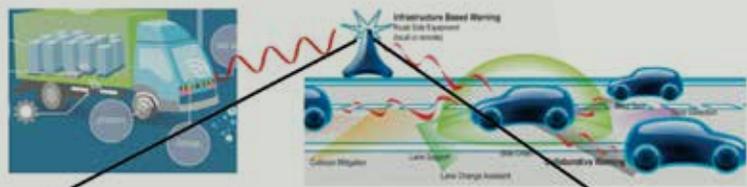
Summary:
 The method and apparatus for angle of arrival estimation are used for estimating the angle of arrival of a received signal by a switched beam antenna array and a single receiver. The switched beam antenna array first collects an omnidirectional signal to be used as a reference

signal. A main beam thereof is then switched to scan an angular region of interest. The collected signals from the switched beams are cross-correlated

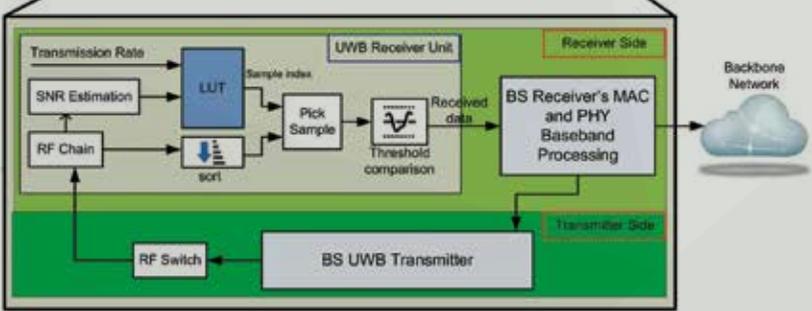
with the reference signal. The cross-correlation coefficient is the highest at the true angle of arrival and relatively negligible otherwise.

Patent title: Non-coherent Ultra-wideband Receiver

Inventors from Qatar University: Ahmed Badawy, Tarek Elfouly, Tamer Khattab
US Patent #: 10396849



Summary:
 The non-coherent ultra-wideband receiver receives an ultra-wideband (UWB) signal, consisting of pulses (or “symbols”) and uses on-off keying (OOK) modulation so that when a binary “0” is transmitted, the receiver collects noise-only samples. The receiver collects samples during the symbol (pulse) duration and sorts the samples by magnitude of voltage or energy. The receiver uses the known transmission rate and the estimated signal-to-noise ratio to retrieve a sample index from a look-up table. The



receiver then compares the signal sample at the index value with a predetermined threshold voltage (or energy). If the selected sample exceeds the threshold, then it is assumed that all succeeding samples also exceed the

threshold (assuming the sort is in ascending magnitude) and the pulse is present and binary “1”. Otherwise, the pulse is absent in the sampling period, and binary “0”. The process is repeated for the signal duration.

Qatar's First ECMO Simulator: When High-Fidelity Meets High Affordability



Dr. Faycal Bensaali, Associate Professor of Electrical Engineering- College of Engineering

Extracorporeal Membrane Oxygenation (ECMO) is a lifesaving procedure developed for the care of patients with short-term respiratory and/or circulatory issues. ECMO was originally established as a standard therapy for newborns suffering from acute respiratory or circulatory failure, but was later extended to be used on adults. Since its development, ECMO has been estimated to help treat over 53,000 patients for life threatening diseases with survival rates up to 75%. The technique involves circulating the patient's blood through an external tubing circuit with a pump used to push the blood through a filter, which provides lung-like oxygenation

and carbon dioxide extraction. The blood is then returned to the patient through the arterial or venous systems depending on whether the patient needs only respiratory or combined cardio-respiratory support. Figure 1 shows basic venous-venous circuitry (VV ECMO).

Although different, ECMO implementations have been used to improve survival rate, however, the technology can potentially result in numerous health complications for patients. Anti-coagulation chemicals are used to prevent blood from clotting outside the body. Moreover, pump failures, oxygenator failures, and tube ruptures are common hardware complications

that decrease the patient-survival rates by 40%. Monitoring those complications requires an ECMO trained multi-disciplinary team as well as an ECMO nursing staff member to be by the patient 24 hours a day. The trained employee needs to watch over fifty clinical parameters and swiftly respond to critical situations.

ECMO is not a widely adopted technology due to its high cost and high-risk nature. An ECMO unit costs approximately \$130,000 and its corresponding oxygenation unit costs around \$5000-\$10000. Simulations, although expensive to perform, increase communication skills, impulse responses,

and procedural emergency management, which are essential qualities for ECMO patient management. There are several hardware ECMO simulators that have been developed for training ECMO staff. All existing ECMO simulators rely on real deoxygenators, and the use of animal blood. The mentioned components have to be disposed and replaced after each simulation session, which makes the current simulators expensive to maintain. This project aims to tackle those issues by building a simulator of the ECMO machine with Hamad Medical Cooperation (HMC). The replicated machine will externally look identical to the real one but will internally contain different hardware components that will be used to simulate the functionalities and emergency scenarios. In addition, the simulated ECMO machine will be fully controllable via an ECMO instructor tablet application for manual control and the creation of custom training scenarios. On the other hand, costly animal blood can be replaced with thermochromic ink, which has the ability to change its color based on temperature adjustment. Thus, a mixture of inks can replace blood circulation, oxygenation and deoxygenation. By having a long shelf life and the ability to be diluted in water, systems usability is boosted while dropping maintenance cost.

Designing the simulator is based on recreating the visual and audio effects of the circuit functionality. For example, pressure conditions of line shattering do not need to be met but only the visual effect, i.e. a vibrating tube.

The proposed design consists of four units-the ECMO unit, patient unit, heater unit and the mock oxygenator. The ECMO

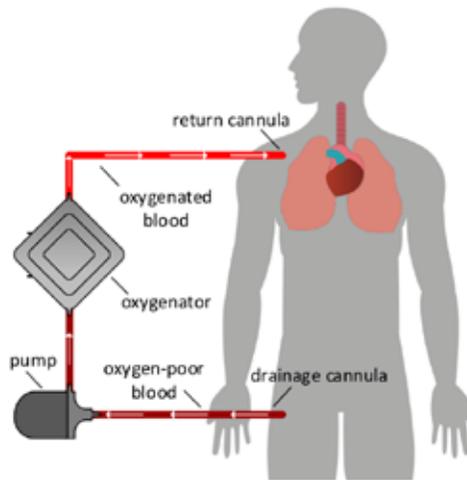


Figure 1. Simplified Illustration of Venous-Venous ECMO Circuit.

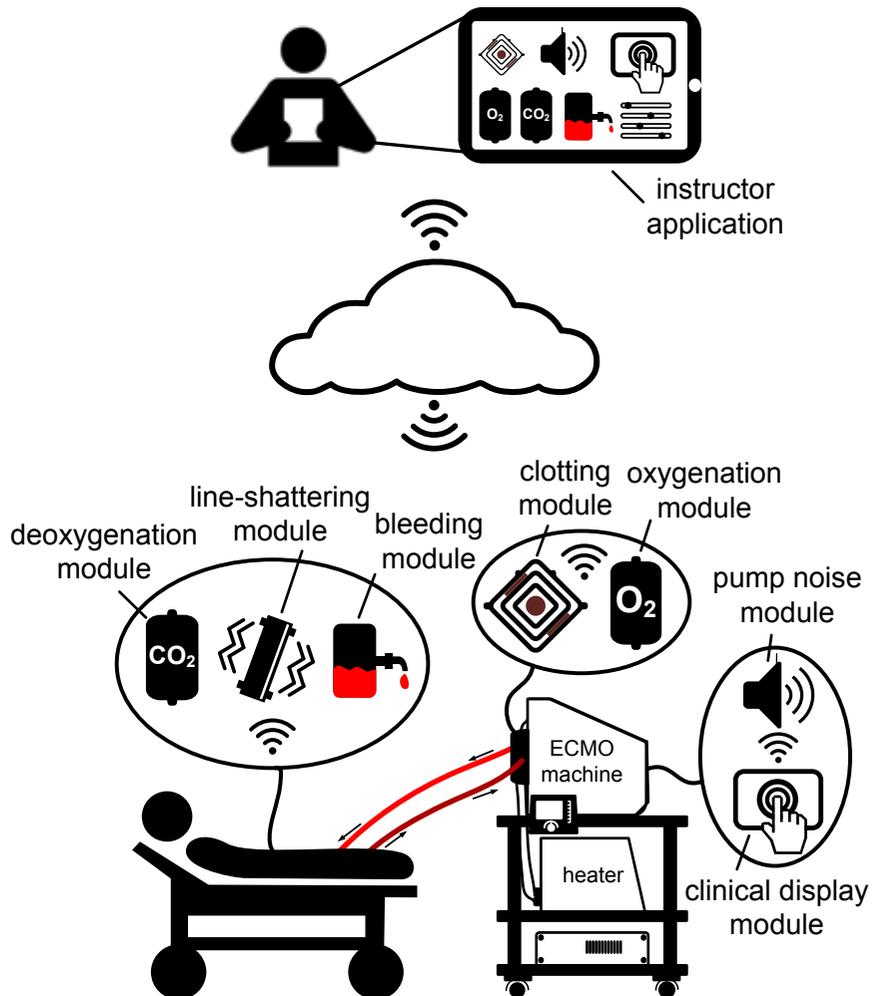
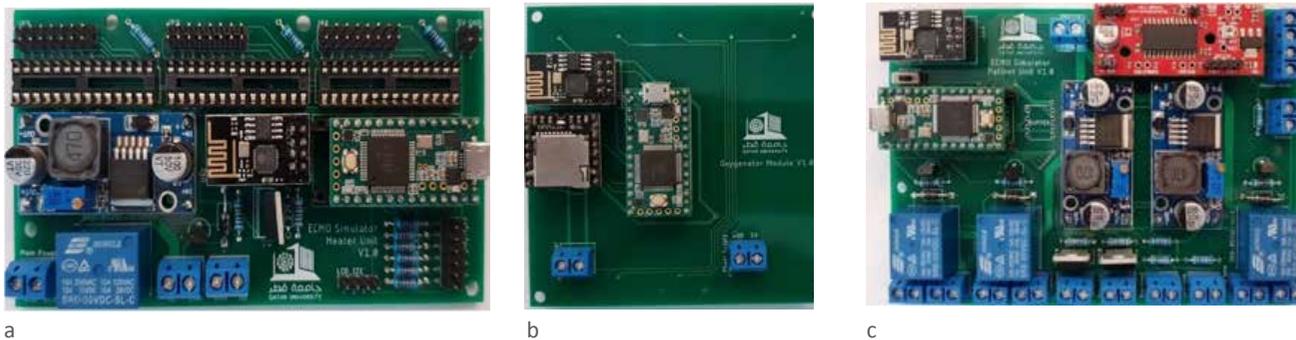


Figure 2. Block Diagram of the Proposed System.



Final Printed Circuit Boards of the System (a) Heater Unit (b) Oxygenator Unit (c) Patient Unit.

unit consists of a replicated ECMO, containing a single-board computer, driving a touch screen that displays a mock ECMO screen remotely controlled by an instructor tablet app, and all necessary knobs and buttons for the trainee to be able to “control” the circuit. A concealed patient unit will include the circulation pump, thermochromic mixture tank, modules that generate physical cues created by ECMO emergencies (e.g. line shattering and patient bleeding) and a cooling unit to simulate deoxygenated blood. The mock oxygenator will be a look-alike empty shell of the MAQUET HLS oxygenator and will act as a hidden bypass allowing thermochromic mixture to flow back and forth from the heater unit. The heater unit will be responsible for thermochromic mixture heating; shifting it to

oxygen-rich color, containing a module to disable heating and simulating hypoxemia. Since the system does not operate on real ECMO hydraulics, it is capable of accommodating both VV and VA ECMO. Figure 2 depicts the block diagram of the simulator.

The research team invented (US non-provisional patent and PCT applications) a brand-new blood color simulation technology, which is the core of cost-effective ECMO simulation workflow. The patented approach utilizes the thermochromism (i.e. the property of a substance that allows reversible color change with temperature) in water-based-ink to visually recreate persistent hypoxemia, (i.e. dark red “blood” through inlet and outlet tubes) oxygenation (i.e. normal operation with dark red and red) and recirculation (i.e. both tubes have red color).

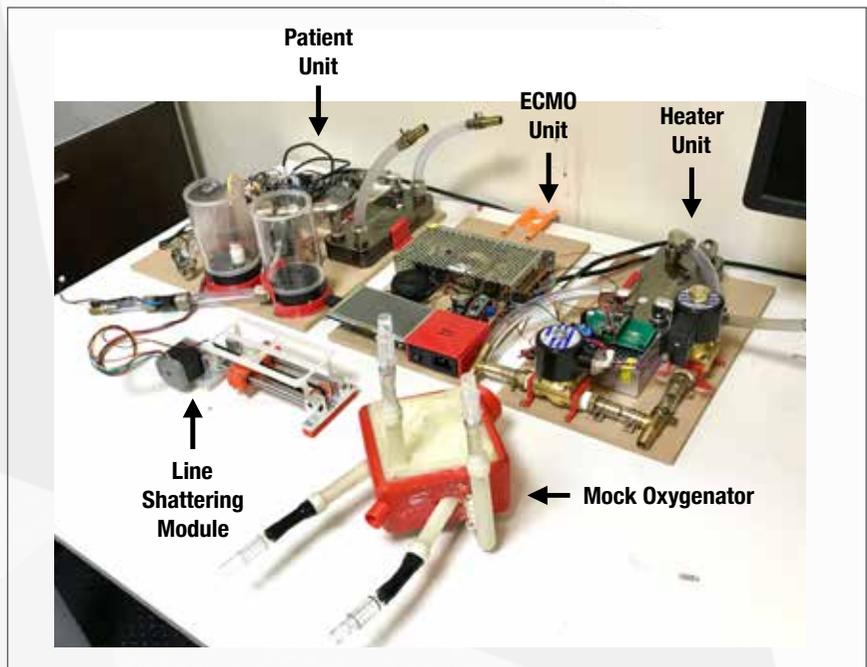
Advantages of an ECMO independent simulator with a modular design approach are reduced deployment and maintenance cost, customizability, expandability and full system control. The simulated blood color change circuit components (excluding the heater-cooler) costs 300 USD to build and can be used indefinitely, (or until a component is damaged) since components are non-consumable. Our thermochromic recipe costs 40 USD/L with a low (mg/mL) concentration degradation over time and an operational lifetime of ten hours. It is up to the user to determine whether circuit component costs, the fluid’s cost and lifetime is acceptable as every component used in the circuit can be substituted by other brands and there are many possible recipes due to the broad selection of thermochromes and dyes in the market. Moreover, our in-house design facilitates ease of use and control since the system electronics are programmable to the user’s preference and can be wirelessly enabled to receive remote commands to perform simulation actions. Overall, many of the existing ECMO related simulation-based learning (SBL) programs could greatly benefit from this innovation to further enhance the participants’ learning.



Simulator prototype panels

Concerning the instructor application, based on our SBL literature search, the use of our instructor application is novel. According to Johnston and Oldenburg, software did not play a part in ECMO SBL until recently. In the last decade, SBL has witnessed technological advancements with notable examples of the Orpheus Perfusion Simulator, EigenFlow and the Parallel Simulator. The Orpheus Perfusion Simulator includes a hydraulic model connected to an ECMO circuit and a screen that displays circuit parameters. It is controlled through a laptop via a USB cable. On the other hand, EigenFlow and Parallel Simulator incorporate remote control through an iPhone app and a Windows tablet respectively. They also provide an additional monitoring screen that displays simulation parameters. Instructors can control various parameters such as hemoglobin and flow rate through the mobile application. However, some changes are actually implemented in the ECMO circuit (e.g. running embolism from the application will actually create obstructions in the circuit). Both applications communicate wirelessly with the simulator peer-to-peer (compared to our cloud-based approach) and lack the Scenario Designer functionality.

In the grand scheme of regional medical simulation, the current state of the simulator is a successful case study of engineering integrating with medicine towards revolutionizing simulations in a high-fidelity and cost-effective manner. Once the simulator's educational efficacy is validated, our product will be directly deployed at HMC ICU for



ECMO machine replica design and fabrication

future ECMO training courses. Following successful local training runs, HMC is planning to hold regional ECMO courses in Qatar using our simulator as the core SBT tool, paving the path towards a regional training facility enabled by technology made in Qatar. The project gained local and international recognition. The team was awarded several reputable awards including 4th Annual Conference of the South and West Asia Chapter of Extracorporeal Life Support Organization (ELSO-SWAC 2017) along with best oral presentation and best poster presentation awards. The team was also awarded 1st place in Senior Design Project Contest 2017, in the College of Engineering at Qatar University and the first place for Best Project in Qatar University Honors Program Project Fair 2017. Moreover, among all QNRF Undergraduate Research Experience Program (UREP) grantees, the project has been awarded first place at the

Eleventh Iteration of the National Competition. From the large expanse of exposure, the project earned through conferences, there is an increasing international demand from ECMO centers in the US, the Netherlands, Korea, Hong Kong and more. Moreover, the Extracorporeal Life Support Organization (ELSO) has expressed keen interest in purchasing the simulator following completion of the evaluation study. In conclusion, the modular ECMO simulator is revolutionizing medical training in Qatar and building global reach. Following the simulator deployment at HMC, the team will seek to commercialize the product in order to satisfy the global demands for cost-effective ECMO simulation. Prospective clients include Sidra, ELSO and hospitals in the US, the Netherlands and Hong Kong. Further funding will be pursued in order to replicate the system for other commonly used ECMO hardware such as the Xenios Platform and Maquet Rotaflow.

QU Heart Research Reveals How a Genetic Defect Leads to Sudden Cardiac Arrest Giving Hope for New Therapies

Cutting-edge research by a team from the College of Medicine at Qatar University (QU-CMED) in collaboration with QU researchers from the College of Health Sciences (QU-CHS) and Biomedical Research Center (QU-BRC), as well as Sidra Medicine, National Centre for Scientific Research 'Demokritos' (Greece) and Cardiff University (UK) has unraveled the mechanism, by which a genetic mutation can lead to early onset of sudden cardiac arrest.

Sudden cardiac arrest is not synonymous with heart attack. A heart attack, also known as myocardial infarction, occurs when the blood flow in one or more of the coronary arteries suddenly becomes blocked resulting in obstruction of the vital oxygen supply to a section of the heart muscle. Sudden cardiac arrest occurs when the heart muscle suddenly stops beating, preventing the oxygen supply to the brain as well as to other organs.

Sudden cardiac arrest often hits young and seemingly healthy victims and is caused by abnormal heartbeat patterns, known as arrhythmias, which occurs when the heart is either beating too fast, too slow, too early or irregularly. A healthy and regular heart rhythm is maintained by the extremely fine-tuned control of calcium levels within heart muscle cells. When



Dr. Michail Nomikos and Ali Al-Maraghi, student at the College of Medicine

calcium levels rise, the heart contracts and when the calcium levels drop the heart muscle relaxes, similar to the upstroke and downstroke of a motor engine.

Led by the QU-CMED Head of Research and Graduate Studies, Dr Michail Nomikos, the research team used a multi-disciplinary approach that could generate a novel understanding to describe the first molecular characterization of a deleterious mutation identified in the gene of a 6-year-old boy leading to the first episode of aborted cardiac arrest. The mutation was identified in a gene that encodes the vital calcium-binding protein termed calmodulin.

Calmodulin, as the name suggests (CALcium MODULated proteIN), is a protein that can be found in many cell types and by acting as a calcium sensor binds and regulates the function of a number of different protein targets. Through this calcium-dependent mechanism, calmodulin thereby affects a wide range of vital cellular processes such as muscle contraction, nerve signaling, fertilization and cell division.

In heart cells, calmodulin specifically interacts and regulates multiple key proteins that are involved in excitation and contraction of the heart muscle. One of these proteins in heart cells is the ryanodine

receptor type 2 (RyR2), a large release channel that mediates the calcium release from the sarcoplasmic reticulum required to activate cardiac muscle contraction.

During the last few years, many clinical and genetic studies have reported a large number of calmodulin mutations resulting in different types of heart arrhythmias, recurrent cardiac arrest in infants and sudden cardiac arrest in young individuals. However, the precise mechanism by which these mutations lead to these life-threatening conditions has not yet been characterized.

The study by QU-team and collaborators used a zebrafish model to examine the effects of the calmodulin mutation that was reported in the 6-year-old boy. Zebrafish has been proven to be an important tool to study human disease genetic mutations, providing novel insights into the mechanism and pathophysiology of cardiovascular disease. The team demonstrated that expression of calmodulin mutation in zebrafish embryos resulted in cardiac arrhythmia and increased heart rate that mimicked the clinical presentation of the 6-year-old boy. Moreover, the team used molecular biophysics techniques to show for the first time that this novel calmodulin mutation disrupts the crucial binding of the protein to calcium ions and also its ability to interact with and regulate the calcium release channel RyR2, resulting in an abnormal calcium release in the heart, leading to arrhythmia and cardiac arrest.

As Dr. Michail Nomikos explained: 'The importance of this study is that we have been able to show exactly how a mutation in a gene causes the problem of disturbed heart rhythm and eventually leads to sudden cardiac arrest in young



The student Ali Al Maraghi is working in the laboratory under supervision of Dr. Nomikos

individuals. By understanding the chemistry of what is going wrong inside the heart cells as the consequence of specific gene mutations, we will be able to design drugs to overcome such life-threatening conditions in the future.'

Dr. Tony Lai an expert in cardiac research underlined: 'Cardiovascular disease is considered the leading cause of death worldwide, accounting for approximately 30% of global mortality. Over 17 million deaths per year are attributed to cardiovascular diseases and it is expected that this number will rise to more than 23 million by 2030.

'It is estimated that almost half of these deaths happen due to sudden cardiac arrest. The survival rate of sudden cardiac arrest is less than 10% globally, therefore it has been acknowledged as a major public health problem, not only in Qatar but worldwide.'

Dr. Egon Toft added: 'Uncovering genetic links like this is vital to help combat the devastating effects of inherited heart conditions. Certainly, the identification of a specific mutation could lead to genetic screening for family members of

someone affected to check if they have this particular mutation. It would help them because they could be advised to avoid certain stressful situations and strenuous exercise that often precedes these events. The other potential approach would be to offer them an implantable defibrillator to shock them, should their heart stop.'

Finally Dr. Nomikos concluded: 'This study is a great example of the involvement of undergraduate students in cutting-edge research projects at Qatar University and especially in the first National College of Medicine, as it is worth noting that part of this work was supported by a QU-student grant and the involvement of a year-four medical student.'

The research article, with title: "Arrhythmogenic calmodulin E105A mutation alters cardiac RyR2 regulation leading to cardiac dysfunction in zebrafish" was published recently in the Annals of the New York Academy of Sciences.

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QTTSC Studies Development of Innovative Intelligent Transportation System Solutions to Improve the Safety and Efficiency of Traffic Operations

By Wael Al-hajyaseen and Qinaat Hussain

Qatar Transportation and Traffic Safety Center,
College of Engineering, Qatar University.



Figure 1: The driving simulator at (QTTSC)

Injuries and fatalities from road traffic crashes are a major public wellbeing concern. It is estimated that around 90% of all road crashes are attributed to human errors (Lewin, 1982). Therefore, it is essential to consider human factors in the process of roadway designing to improve safety and operational aspects of traffic. However, to test new design alternatives and investigate driving behavior on-road? is always expensive and unsafe. In contrast, driving simulators offer a safe and controlled environment to incorporate human factors in research related to road safety and traffic operation (Llopis-Castello et al., 2016 and Hussain et al., 2019). Qatar Transportation and Traffic Safety Center (QTTSC) in the

College of Engineering, Qatar University focuses on driving simulation-based studies. In 2019, the center installed an advanced driving simulator (Fig.1) which consists of two main components: (a) the driving unit – a fixed base cockpit of the Range Rover Evoque equipped with speedometer, force-feedback steering wheel, pedals, gearbox and indicators, (b) three large screens covering 135 degrees of horizontal field of view (5760 x 1080 pixels; 60 hertz refresh rate). The components are interfaced with STISIM Drive 3 along with the CalPot32 Program that offers high-speed graphics and sound processing. The simulator has passed an extensive validation process for the external validity (speed perception and actual speed) and subjective validity (Hussain et

al., 2019).

In one of the studies, we investigated the impact of innovative red-light running RLR countermeasures on driving behavior at signalized intersections. To this end, five conditions were compared to measure their effectiveness on red light, running RLR prevention and promotion of safe stopping at signalized intersections. The five countermeasures include a default signal setting with signal order of green-yellow-red and four treated conditions. Two of the four treated conditions were based on advanced warning: a condition with 3 seconds advance warning displayed by flashing green; and a condition with animation-based warning variable message sign fixed



Dr. Wael Al-hajyaseen

on a gantry (RW-gantry). The two other treated conditions were based on innovative countdown systems for the yellow interval, i.e. red LED ground lights integrated with a traffic signal (R-LED) and yellow interval countdown variable message sign (C-VMS). Sixty-seven volunteers were invited to participate in the driving experiment possessing valid Qatari driving licenses.

Results show that RW-gantry and R-LED are effective treatments in lowering RLR occurrences (see Fig. 2) and promoting safe stopping at signalized intersections. Although, flashing green is the default traffic signal setting in Qatar, however the analysis indicated that F-green could prolong the length of the indecision zone and hence a potential for conflicting decisions among vehicle drivers approaching the intersection at the same time. Therefore, it is important for policy makers to consider the results of this study while making decisions about traffic signal settings at signalized intersections in Qatar.

In another study, the drivers' behavior using dynamic merge control on rural and urban expressways was evaluated. Seventy-two drivers were selected for this study within the State of Qatar with an inclusion criterion of possessing a valid Qatari driving license. The low-cost static merge control (scenario 1: Baseline condition with static signs; scenario 2: Road markings) was compared with different variable message signs, VMS designs such as lane



Figure 2: Percentage reduction in the probability of red light running for five tested treatments

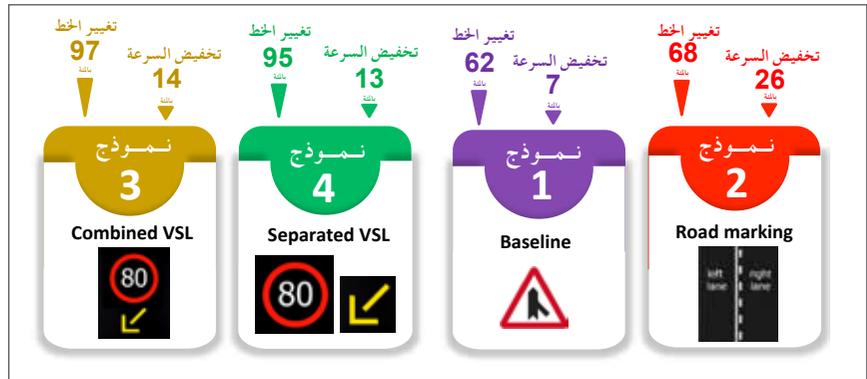


Figure 3: Percentage of lane change & speed reduction for dynamic vs static merge control strategies

control arrows and variable speed limit VSL strategies (scenario 3: Combined VSL; scenario 4: Separated VSL). The results show that dynamic merge control is more effective for rural and urban expressway (see Fig. 3). The earlier lane changes in combined VSL scenario (97%) and the separated VSL scenario (95%) contributed to smooth maneuvers and gradual speed

reductions on the rural expressway and improved safe driving behavior as compared to static merge control (Reinolsmann et al., 2019). These results provide important insights for road authorities in Qatar (Ministry of Transport and Communications and Public Works Authority); especially with the start of implementing lane-based merge control strategies, which are several expressways within the country, such as Lusail Expressway.

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QU Faculty Member's Research Draws International Acclaim

This piece outlines a special achievement of one of the distinguished faculty members at the Health Cluster of Qatar University, Dr. Zumin Shi, from the Human Nutrition Department, College of Health Sciences.

Dr. Shi led a team of researchers to examine the effect of excess chili consumption on cognitive ability. The results were based on a study that spanned a period of 15 years (from 1991 to 2006). Several prominent scientific journals as well as many newspapers, audio and TV media channels cited the investigation in their respective broadcasts and writings.

The study concluded that consuming more than 50 grams of chili per day is 'strongly correlated' with faster cognitive decline. This population based longitudinal study is significant as it managed to include a large focus group of 4582 Chinese adults aged over 55, for a period of 15 years. More interestingly, the study pinpointed that memory decline was more significant if chili lovers were slim; indicating that excess chili consumption might eventually lead to dementia in the said population.



Dr. Zumin Shi,
Associate Professor of Human Nutrition,
College of Health Sciences

As such, chili consumption that has been considered beneficial specially for body weight and blood pressure management; has been shown to have serious adverse effects on cognitive abilities over long periods of time. In addition, excess chili consumption almost doubles the risk of memory decline and may lead to poor cognition.

The study was published in the *Nutrients Journal* in May 2019, cited by various newspapers and scientific platforms such as

the *New York News*, *BBC News*, *Australian*, *Malaysian*, *Chinese* and several other media and publications outlets. The Altmetric Attention Score, which evaluates the significance and scope of attention a given research attracts, is so far 790, which is one of the highest in the world (ambiguous sentence, fails to convey context, please revisit). In the Chinese social media platform Weibo, a report on Dr. Shi's study reached 350 million views. Nevertheless, the study made most profound impact in Middle and East Asia, since China and other Asian countries have a high consumption of chili and with the rapid population ageing, the prevalence of dementia is very prominent in these populations. Dr. Asmaa Al-Thani, the Dean of the College of Health Sciences, praised Dr. Shi's 'wonderful achievement' by saying, "The College of the Health Sciences has been growing exponentially over the past couple of years, with new programs on graduate and undergraduate levels being introduced. This scientific achievement will surely solidify our standing in QU Health, as well as internationally."



Career Path to Animal Research: A Success Story and Achievement

As a biology undergraduate, my ambition of becoming a researcher was a distant dream until I found an opportunity to join the Laboratory Animal Research Center (LARC), at Qatar University as a graduate assistant. This initiative changed my vision and exposed me to the world of science using animal models that eventually helped me to choose my scientific career.

LARC is a state of the art animal facility in Qatar University that acts as a common platform for all the researchers in Qatar, who wish to conduct studies using rodent animal models. Since I started my tenure without any experience related to animal studies, I was guided and trained by the LARC staff at every step, and helped in gaining knowledge on animal ethics. My duties also involved handling of rat, mice and other husbandry activities related to animal studies.

LARC has an inbuilt diagnostic laboratory division to monitor the health status of animals through routine health monitoring. The diagnostic laboratory division is actively involved in health monitoring of rodents such as rats and mice models using innovative diagnostic tools. Both the microbiological and molecular divisions are supporting this service with precise diagnostic methods. Within a short span of time, I could learn the necessary techniques as my interaction and opportunity to work with the staff and scientists in LARC helped me to embark on a research project to study the structure of Microbiome population in



Reem Alasmar, Graduate student at Environmental Sciences - Qatar University

Sprague Dawley rats under the guidance of Dr. Hamda Al-Naemi, the Director of LARC.

During the summer of 2019, I got the opportunity to enroll myself in the “Summer Internship Program” conducted by LARC. The four-week program comprises of theory and hands-on practical sessions that enriched my knowledge on bio-surveillance and health monitoring of rodent animal models using a panel of bacteria and virus. The diagnostic methods of LARC are ISO certified and the health-monitoring panel is an extended one covering bacterial and viral organisms, first of this kind in Qatar to monitor the health status of animals.

During my journey with LARC, I could interact with undergraduate and graduate students who come to conduct their research at LARC laboratories. Moreover, I benefited a lot from seminars and meetings. This opportunity gave me the insight and confidence in choosing microbiology

research for my graduate studies. Currently, I am successfully enrolled in Master’s program at the department of Biological and Environmental Sciences while working as a graduate assistant at LARC.

My stay at LARC also enabled me to interact with researchers from other institutions in Qatar, since LARCs’ resources are currently being used also by Biomedical Research Center and College of Medicine, Qatar University; along with other stakeholders, namely, Hamad Bin Khalifa University (HBKU), Sidra Medicine, Anti-Doping Laboratory (ADLQ) and Hamad Medical Corporation (HMC). Graduate assistantship in LARC is a great privilege and I would say it is a lifetime opportunity for me to build my scientific career. I am thankful to LARC and Qatar University for all the support. I would extend my support wherever possible and contribute the best of my efforts to future research endeavors in Qatar University.

Qatar University Students Attend the Second World Congress on Undergraduate Research



Participant students and supervisors in Germany

A brief historical context

To discuss the Second World Congress on Undergraduate Research, a brief overview of the First World Congress on Undergraduate Research is important to give in order to provide a context for the recent Congress held. The First World Congress was staged in Doha, in Qatar University in November 2016.

It was a historic event given that it brought together for the first time in history major international players in undergraduate research namely the American Council on Undergraduate Research (CUR), the British Conference on Undergraduate Research (BCUR) and the Australasian Conference on Undergraduate Research (ACUR) to work together with the College of Arts and Sciences at Qatar University and stage collaboratively the first global undergraduate research conference. During this event, that took two years to

prepare, undergraduate researchers and scholars from all over the world representing 5 continents and 110 institutions came to Qatar University to share their research projects and findings.

The Congress was a great opportunity for Qatar University students to meet undergraduate student researchers from other countries, to discuss their experiences and share their own research findings. The Congress was a success, especially because of the signing of the “Doha Declaration” by the Congress Steering Committee, that paved the way for creation of the first International body in charge of promoting the global undergraduate research, namely “World Congress of Undergraduate Research Councils”. During this Congress, the Steering Committee also approved the hosting of the Second World Congress on Undergraduate Research by the University of Oldenburg, Germany in May 2019

and named Qatar University as a full organizing partner.

The Second World Congress

As a member of the World Congress of Undergraduate Research Councils Steering Committee and the Second World Congress Organizing Committee, Dr. Maher Khelifa- Associate Professor of Psychology, coordinated with the Office of the Vice President for Research and Graduate Studies (VPRGS), for undergraduate students to represent Qatar University at the Second World Congress.

The Vice President, Dr. Mariam Al-Ali Al-Maadeed and her team lended all the crucial support to this initiative and put all the efforts of her good office to encourage and fund student participation. Her help was truly instrumental and priceless. The efforts of Dr. Aiman Mahmood Erbad, Dr. Abdelbary Elhissi, Dr. Mohammed Maqbool Ahmed, and Miss Rowda Sulaiman Al Hamadi

were invaluable.

[Please place here a group photo we had with Dr. Mariam before the departure to Congress]

When the World Congress made call for abstracts, a Task Force for Undergraduate Research was created by the Vice President, Dr. Mariam Al-Ali Al-Maadeed, spearheaded by Dr. Aiman Mahmood Erbad, Dr. Abdelbary Elhissi and Dr. Maher Khalifa. They issued an internal call for abstracts to Qatar University students and their respective Associate Deans for Research. About 50 Qatar University students submitted their research abstracts to the Task Force, which vetted the internally submitted abstracts based upon international abstract submission criteria and suggested appropriate changes to all submissions.

After revisions were done, the green light to submit abstracts to the World Congress was given to the students. The Second World Congress Abstract Review Committee accepted a total of 25 abstracts out of 48 submissions by QU students. Accepted submissions were further evaluated internally during an oral session that spanned one day, to select a total of 8 participants and receive fully funded scholarships by the office of VPRGS to attend the Congress and represent Qatar University. The selected students, from College of pharmacy and collage of Health Sciences were:

Samer Haithem Ali, Ibrahim Hamdy Ezzat Abdelhafez, Al-Hussain Ahmed Mohamed Abdallah, Iqrah Mohamed Qurishi, Bassant Amr Adly El Kattan, Sara Turki Amin Alreed, Kamilia Omar Ahmed Zubeir, Munia Muhamed Abdelrahman Hamdan.

The students truly represented Qatar University to the best of their efforts and in the most positive light. They were able to impress Congress attendees with the quality of their research projects through both oral and poster presentations. They were well prepared, with

original topics and excellent presentation skills. Kamilia Zubir, student of Environmental Sciences, received one of the six Research Excellence Awards for her research on “Antibacterial activity of new Sponge species isolated from the Qatari marine zone”. The honor and distinction was well-deserved given the impact of her research and her promising discoveries.

The students indicated that they had a unique experience and that they learned a lot as a result of the participation. The event was an opportunity for them to meet students and researchers from other countries and to form research networks. The Congress brought together 583 participants, who included students, faculty and administrators from 37 countries, representing 117 institutions from Europe, Americas, Africa, Asia, Australia and Oceania.

All submitted abstracts underwent blind reviews by three and in some cases by at least two reviewers. In general, two reviewers were from relevant discipline of the applicant and one from a non-related discipline to check for readability and clarity of the abstract for non-specialists. The reviewers rejected submissions that did not meet scientific standards of the Congress.

In general, the aim of the Congress was to bring undergraduate researchers and scholars from all over the world to share their research findings, to create lasting research networks, and to foster research collaborations between undergraduates across the Globe. The event was an opportunity for students to engage in global dialogue across many fields of inquiry. It was also an opportunity for the next generation of scholars to address the most significant challenges facing the world.

The Congress was held for four days with the first day entailing a cultural trip to historic sites in Bremen, Germany and the neighboring Groeningen, in



Kamilia Al Zubair while receiving her award

Netherlands. The inaugural day included a baton-passing ceremony where Dr. Khelifa, Chair of the First World Congress on Undergraduate Research passed the baton to the Chair of the Second World Congress, Dr. Susanne Haberstroh of the University of Oldenburg.

The inaugural keynote speech was delivered by the planetary scientist, Dr. Lujendra Ojha of John Hopkins University on the “Grand Challenges Related to Resource Scarcity in the Future. His synopsis, solutions, and ideas on “undergraduate Involvement” were exceptionally inspiring. The second keynote speech delivered by Drs. Anne Dippel and Sonia Fizek on “Playful Research by Design: Why the world needs thinkers, tinkerers, and team players” was extraordinary as it discussed facing the challenges of interdisciplinarity and the opportunities it entails.

The Congress included six main research themes namely, “The Environment”, “Health”, “The Economy”, “Communication”,



Prof. Mariam AlMadeed with the nominated QU students to attend the Second World Congress on Undergraduate Research in Germany

“Politics” and “The World we Create”. A total of 244 students representing 35 countries and 92 universities were present at the Congress. Given the high level of scrutiny for all accepted abstracts, the Congress maintained high scientific standards and as a result students who attended the event and benefited immensely. Students and faculty members throughout expressed their utmost delight and a high level of satisfaction with the Congress and its various activities. The Thematic Sessions that brought together students from the same field in all six themes of the Congress were especially very informative and helped students exchange ideas about topics of their specific field and helped them develop peer networks for future projects of international interest. Qatar University students found the Congress to be extremely beneficial and informative as they expressed total satisfaction with all aspects of their participation. They indicated that they have learnt a lot as a result of their exposure to other researches conducted by students from other parts of the world especially the US, UK, Australia and Germany.

Through the course of events, the World Congress Steering Committee met to elect its new board and Dr. Khelifa was elected by a unanimous

vote as the inaugural president of the newly created “Alliance for Global Undergraduate Research” (formerly The World Congress for Undergraduate Research Councils). The Alliance will oversee, regulate and promote undergraduate research the world over.

Previously there were only uncoordinated national associations regulating undergraduate research at a regional level but with this development, the Alliance will act as a body that can steer undergraduate research forward globally.

The Congress was also a forum for national undergraduate research organizations to share best practices and to work together to develop and promote undergraduate research. The World Congress saw also the birth of the MEACUR (Middle East and Africa Council on Undergraduate Research) which was established by Dr. Maher Khelifa at the margin of the Congress and I will work on developing further for the promotion of undergraduate research in the region.

A Graduate Fair was also organized during the session and Dr. Maher manned a booth to represent Qatar University and showcase its graduate programs along with Miss Rawda Suleiman Al Hamadi and two students namely Bassant Kattan and Yasmeen Mahgoob.

This was a great opportunity to promote Qatar University and to position it as a Champion of Undergraduate Research and as an institution that hosted the First World Congress on Undergraduate Research. It was at QU, where the Doha Declaration was signed signaling the birth of the “World Congress of Undergraduate Research Councils” now renamed the “Alliance for Global Undergraduate Research”.

In general, the Second World Congress on Undergraduate Research, just like the First Congress was a great public relation opportunity for Qatar University as the university positioned itself forever as the place where Global movement for undergraduate research began.

The World Congress on Undergraduate Research is expected to organize a meet in early September (mention complete date) to discuss the 2022 World Congress. So far the institutions expressing interest and provide commitment include the following universities:

The University of British Columbia, Warwick University-UK, University of Hawaii-USA, and New York University. The 2024 edition has been already approved and will be staged by ACUR, Australia.

Patent Application of New Electrocoagulation System for Produced Water Treatment



Dr. Muftah El-Naas

Inventors: Dina T. Moussa and Prof. Muftah El-Naas, Gas Processing Center - Qatar University

Produced water is generated when oil and gas are extracted from the ground, and it usually includes the natural water layer within the reservoir (formation water) as well as the injected water. Generation of large amounts of produced water represents a major environmental and economic challenge to the Oil and Gas Industry. Although there are many studies that attempt to address this challenge, but there has not been any significant development in the treatment of produced water, and most of these

studies have achieved limited success.

The New Electrocoagulation System for Produced Water Treatment introduces a novel electrocoagulation cell for the treatment of produced water, with the aim of reducing electrode passivation, which has always been considered as the bottleneck in electrochemical treatment of contaminated water. The new electrocoagulation cell uses an innovative form of electrode design and arrangement to eliminate or reduce the formation of passive layer to be effective for the treatment of produced water resulting in a significant reduction of cathode passivation

and energy consumption. (Use present continuous or mention that you performed an experiment, you cannot talk about the process directly without mentioning the experiment at least by name).

The new cell design (Figure.1) was fabricated at the Gas Processing Center, Qatar University and was tested for the treatment of produced water. The EC (use the abbreviation with the full form once, initially) system consists of three 1.8 L cylindrical Plexiglas vessels for the feed tank, reactor cell and settling tank. The electrodes were made of iron and aluminum (commercial grade) with different geometries and same anode surface area (84 cm²). For each

metal electrode, three different configurations were fabricated for the sake of comparison—plate electrodes, cylindrical electrodes and perforated hollow cylindrical electrodes. For the perforated cylindrical electrode (Figure 2), the height of the exposed surface is adjusted to give the same surface area. An air compressor was used to supply air at a flowrate of 7 l/min for cleaning the electrodes. In the case of perforated hollow cylindrical electrodes, air was injected through the top of the electrode and allowed to diffuse from the perforations upward along the electrode surface, where it is intended to act as a passivation prevention mechanism. A DC power supply was externally connected to the electrodes with adjustable current input. The system was tested and optimized in the batch mode and then operated continuously at optimum conditions. In order to achieve best performance of the selected electrode geometry, the operating parameters were optimized using Response Surface Methodology (RSM), which is one of the most widely used techniques in the literature. It is a combination of mathematical and statistical techniques with the aim to describe the behavior of experimental data, capturing all non-linear intricacies between the independent variables and system outputs.

The contaminants reduction efficiency of the proposed design was evaluated and benchmarked with multiple cell configurations. A perforated hollow cylindrical cathode was used with compressed air allowed to flow from cathode perforations to clean the electrode and provide sufficient mixing. The new electrode design was tested for treating synthetically produced water and the results were compared to basic electrocoagulation setups with plate electrodes. The perforated electrode proved to be superior to other configurations and effective in mitigating passivation, reducing the energy consumption by about

70% compared to the typical plate electrode.

The new cell design achieved a steady state reduction of the organic contaminants in the produced water by up to 97%, 98% and 95% for TOC, TPH and O&G, (better to use with full form) respectively.

This study focused on designing a new electrode that would overcome cathode passivation, a major limitation of electrocoagulation technology, regardless of the operating conditions. The system was simultaneously run at optimum conditions in a continuous mode of operation and the cathode passivation was monitored. It was

observed, that cathode passivation was minimized significantly and the system performance was stable even with continuous operation for 90 minutes.

In conclusion, this study produced a novel reactor design that proved to be effective in treating produced water and showed enhanced performance compared to simple electrocoagulation electrode, especially in mitigating passivation. The new design can be utilized in the treatment of produced water generated from Oil and Gas industry as well as highly contaminated industrial wastewater such as refinery and GTL wastewater.

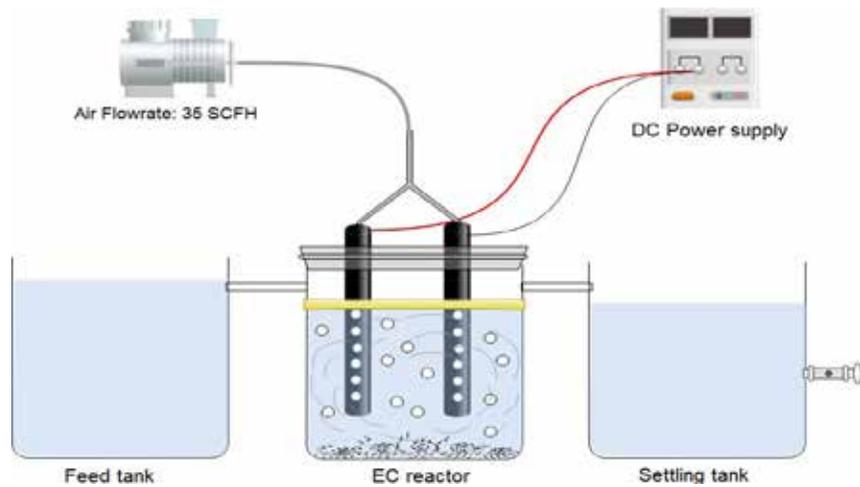


Figure 1. A schematic diagram of the EC setup.

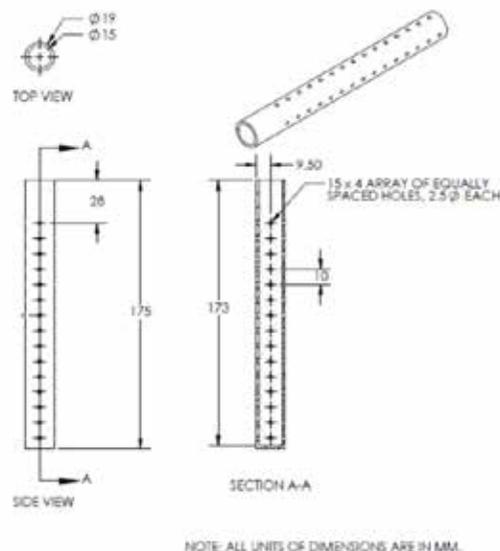


Figure 2. Detailed drawing of the perforated cylindrical electrode.

Mangroves (*Avicenna marina*): A Key and Invaluable Member of Qatar's Marine Environment



Mangrove Forest in Al-Thakhira, Qatar.

There are various and several important organisms that inhabit the coastal zones and many seas and oceans in the world. Among those organisms, is the one that can stand out from the rest: The mangroves. They are trees that live in the coastal zones of the marine environment, at the tropical and subtropical regions in the World. Mangroves exist in varying numbers, and with enough densities of mangrove trees, they become a mangrove forest. The mangroves grow in the coastlines and exist mainly in the intertidal zone. Distribution of mangroves can be seen along the coasts in the shallow, warm and saline waters with relatively calm sea wave actions. They are also considered halophyte plants that can tolerate and live in highly saline environmental conditions.

Mangrove roots and protruding pneumatophores.

Mangroves are known for their

adaptive capabilities and various special characteristics. They are adapted to live in shallow and saline environments, unlike other trees. Their adaptation can be observed through their physiology, where they have root attachments called pneumatophores that protrude from the sediments and allow the plant to breathe oxygen in the anoxic soil conditions. These pneumatophores and roots all make for a complex and interweaved root system. They have a distinctive reproductive strategy, which is divided into two main strategies: Vivipary and water dispersal of the seeds. Meaning, mangrove plant's seeds germinate on the tree itself and become seedlings, which become heavier and drop from the mangrove plant. The seedlings float on the water surface and are transported by the currents until they attach themselves to the soil substrate and eventually grow into the mangrove tree.

Mangroves serve an essential role



Mr. Jassem Al-Thani, Environmental Science Center.

in the environment, by building a habitat for marine and terrestrial organisms. Various species are dependent and associated with mangroves including marine mammals, birds, fishes and invertebrates. These species are distributed in several ways, with some living in the soil, the water and some even live on the mangrove roots. The associated crustacea like crabs, are substantial players in coastal



The Socotra cormorant

environmental maintenance and in aiding mangroves. These crabs dig burrows in the mud at the mangrove forest, where they live, breed and feed. Incidentally, these burrows can aerate the anoxic sediment, thus counteracting the lack of oxygen in the soil due to organic matter decomposition by bacteria.

Mangroves serve the ecosystem in many ways, which benefits humans, marine organisms and the environment. One of the very important roles is carbon capture and sequestration. Carbon, in the form of carbon dioxide, is captured by mangroves and assimilated as plant biomass, or sequestered as organic carbon in the sediments of the mangrove forest. Mangroves are known to capture and store 5 to 8 times more atmospheric carbon (CO₂) than boreal and even tropical forests. It also approximately captures 25.5 million tons of carbon every year. The uptake of atmospheric carbon at such large quantities, indicates a great efficiency in reducing carbon dioxide emissions and organic matter production in the soils of the coastal environments. This is of great help in reducing greenhouse gases that contribute to global warming and climate change. In other words, mangroves are a tool for the fight against climate change. Mangrove forests are

significant players and components in biogeochemical cycling of carbon in the environment and provide an estimated amount of 10% of the dissolved carbon to marine environments in the world.

The mangrove trees and their complex root systems protect the shorelines against floods, hurricanes and tsunamis and help protect the coastal areas by dissipating the strong wave energy. This root system also helps in filtering the water and reducing the turbidity by accumulating and trapping the sediments near the roots, and therefore, protects the nearby ecosystems and seawater from natural sedimentation that can kill many organisms including coral reefs and seagrass meadows. Mangrove forests also serve as nursery grounds for a variety of different fish and crustacea

species, which is crucial for local fisheries of these seafood species. It also provides nutrients and organic matter via detrital matter and their fallen leaves to the nearby coastal ecosystems, such as salt marshes and seagrass meadows, allowing them to thrive when they are near mangrove forests.

Mangroves are undeniably important and invaluable to the oceans and seas of the world, and an essential component to both terrestrial and marine environments due to the significant part they play in the environment and the ecosystem services they provide.

Mangroves in Qatar:

Mangroves are key players in the Qatari environment serving many great purposes and provide a variety of essential services. Qatar only has only one mangrove species which is the grey mangroves (*Avicenna marina*). They are an essential component of the rare dense natural greenery in Qatar and provide it with natural beauty and a habitat for local fauna. Mangrove forests are a hot spot for marine biodiversity, particularly for marine birds, fish and invertebrates such as gastropods, crabs and shrimp. They are also found in the same areas as salt marshes, making for highly productive ecosystems when in close proximity with each other. The species harbored by the mangroves forests in Qatar include many marine species such as the



Mangrove roots and protruding pneumatophores



Flowers of mangrove

blue crab, the endemic shrimp (*Palaemon khori*), flamingos, the purple mud crab, the Socotra cormorant and several fish species.

The Socotra cormorant (left) and the purple mud crab (right).

As previously mentioned, the mangrove forests provide many benefits and services to the environment in Qatar. They help purify the air against harmful greenhouse gas emissions and turn them into organic matter which helps the marine environment and especially detrital feeders such as crabs and bivalves. Many marine organisms are highly dependent on mangrove forests as hatching and nursery grounds, and some organisms, such as terrestrial herbivores, birds and invertebrates depend on them as a food source.

Mangrove forest root system in Qatar.

The complex roots of the mangrove forests also stabilize the soil and protect the Qatari coastal areas against coastal erosion from high tides and strong waves. Therefore, mangroves are undeniably essential for Qatar’s environment, ecology, marine and terrestrial biodiversity.

Furthermore, mangroves in some areas can be found near seagrass meadows and salt marshes. The proximity to these other marine ecosystems make for a marine

environment that has strongly coupled ecosystems and highly productive coastal zones, which contrast to the less productive offshore waters of Qatar. The nutrient, organic matter and energy exchange between these ecosystems lead to a thriving local Qatar marine fauna, and ensures that these ecosystems work in tandem to be highly productive.

The biggest threat to mangroves is unbalanced human activity. The loss of mangroves directly by physical removal, dredging and pollution, or indirectly by climate change and global warming, can lead to disastrous consequences to the environment and the existing marine ecosystems. When mangrove forests are destroyed, the ecosystem services will be lost. Loss of these services and its effects on the Qatari environment will include the collapse of local fisheries, important marine food chains will be gone, and coastlines will be more vulnerable to flooding and extinction of marine species. In addition, the loss of carbon capture and sequestration, which is important to reduce the amount of greenhouse gases in the air, which could in-turn, make the marine environment more susceptible to the deleterious effects of climate change. Such environmentally destructive acts can be stopped by increasing environmental

awareness, sustainable urban development, stopping pollution, organizing clean-up campaigns, and more importantly, banning mangrove forest removals.

Mangroves are protected in Al-Thakhira reserve and in Al-Khor, which are some of the well-known environmental conservation areas in Qatar. These have been established to protect the vast mangrove forest that has been slowly degrading over the years due to land reclamation and deforestation in the northern Al-Thakhira area and Al-Khor. The reserve is a protected area for the mangroves and naturally the many species of fauna and flora within the reserve such as sea turtles, crabs, shrimps, gastropods, macroalgae as well as the nearby salt marsh shrubs. One of the efforts to help the environment is to plant mangroves in large amounts along the coastlines.

This has been done in Qatar as a response to the increased removals in the coastlines because of urban developments. These plantations have taken place in Al-Shamal and in Al-Wakra, more specifically in Um Al-Hool, where they have been planted in large numbers. Mangrove plantation is an effort to try to recover the mangrove ecosystems, but those prospects are not always successful, and once mangrove-dependent species are extinct or gone, it is very difficult or at times virtually impossible to try bringing them back to the environment again. However, if the plantations are successful in reversing the destruction and the harm caused by mortality of mangrove forests, it will allow for the environment of Qatar to be productive and still provide irreplaceable ecosystem services.

Conservation and protection of mangroves must be a priority so as not to lose these crucial plants and their associated organisms and services and ensure the current populations and future generations benefit from them.

Impact of ICTs Diffusion on Environmental Quality in Qatar

Lanouar Charfeddine & Asma Al-Maadid & Yosra Hamana



Dr. Lanouar Charfeddine, Associate Professor of Economics- College of Business and Economics



Introduction

Climate change, global warming and environmental degradation in general have been some of humanity's greatest challenges and there is no doubt about their threatening effects on human life quality, health, and the possible effects on future generations. Several studies have shown that if no actions are taken in the near future to deal with the problem of global warming in an effective way then it is expected that the average global temperatures will go up by more than 2°C, which is very critical for the quality of life on our planet. The consequences of this will be a rapid rise of sea levels, encroaching seas, increased heavy rainfall, increase in extremes heat waves, droughts, mass extinctions, decreased crops and fresh water and the melting of the Arctic. Climate change and global warming

heavily affect GCC countries and their effects are even more threatening since all GCC countries are characterized by dry, hot and dusty climate. Many GCC countries are among the world's top countries in terms of CO₂ emissions per capita and levels of ecological footprint.

Conscious about the possible worsening situation if no action is taken, Qatari policy makers and the government of Qatar have set the improvement and preservation of the quality of the environment as one of the top priorities of the country. For instance, the fourth pillar of the Qatar National Vision 2030 is devoted to environmental development. However, the task of improving the environmental quality of the country is challenging, considering the upcoming events (hosting of the world cup 2022 and QNV

2030) which require a sustainable level of economic growth. Since the energy sector remains one of the most important sectors of the country, improving the quality of the environment without reducing energy consumption makes the task more complex. In this article, we have attempted to discuss the merits of the investment, adoption and diffusion of Information and Communication Technologies (ICTs) in addressing environmental degradation.

Environmental Degradation and ICTs in Qatar

Environmental degradation in Qatar Several proxies have been used to measure the quality of the environment in a given country. Recently, the total ecological footprint has emerged as the preferred method as it accounts for six components (cropland, grazing land, forestland, fishing ground,

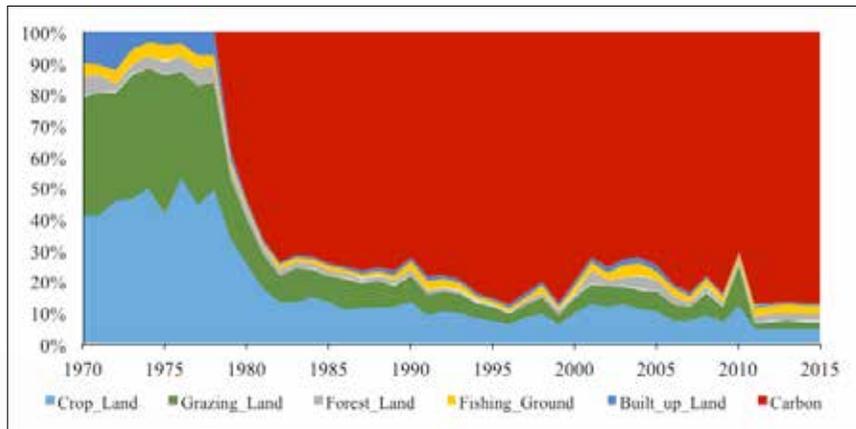


Figure 1

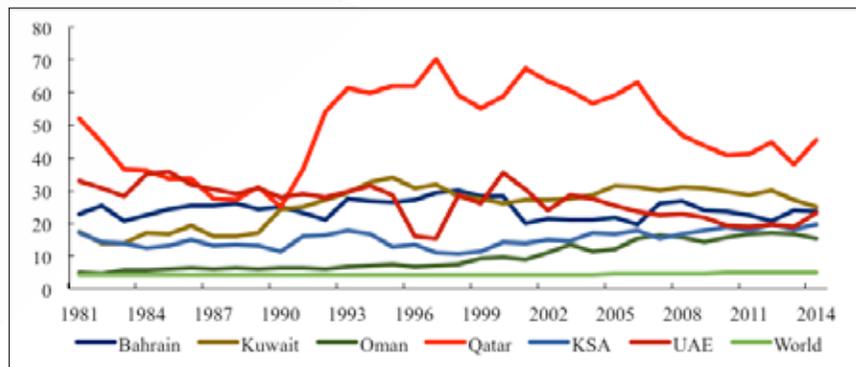


Figure 2 :

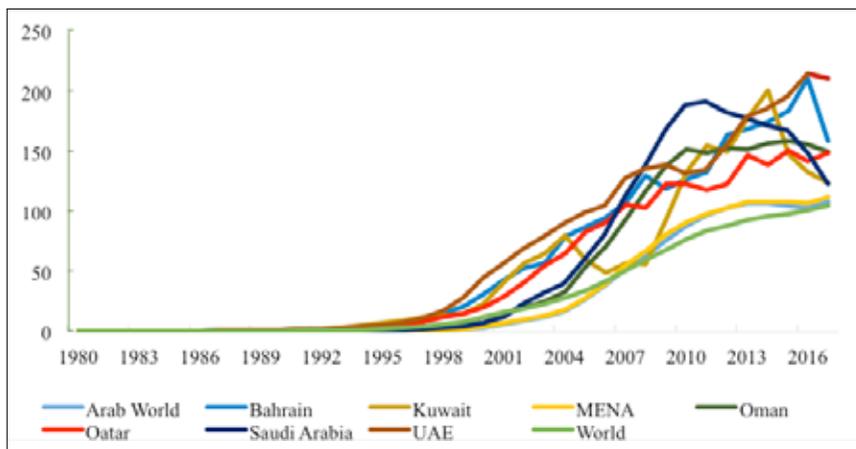


Figure 3 :

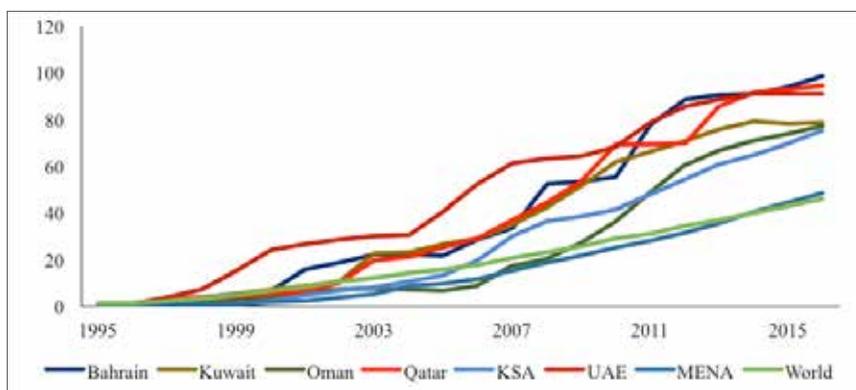


Figure 4

build land and carbon) that cover the three types of pollution namely air, land and water pollution.

Qatar is ranked among the top countries with the highest level of total ecological footprint in the world. Statistics from the global footprint ecological network show that in 2015 the total ecological footprint exceeds Qatar's biocapacity by more than 6 times.

Figure 1 below reports the contribution of each environmental degradation component to the total ecological footprint. Early on, the carbon footprint was very low and close to zero. However, since 1980, a boom in the production and consumption of energy, has allowed it to become the main contributor to Qatar's ecological footprint with a share that exceeds 88% by 2012.

CO2 emissions per capita

Figure 2 below reports the evolution of CO2 emissions per capita in all GCC countries and the average global level. It shows that before 1990, Qatar had a level of CO2 emissions per capita comparable to that of the other GCC countries. However, since 1991, Qatar shows a higher per-capita level of CO2 emissions than that of all the GCC countries and approximately 7 times higher than that of the global average.

2.2. ICTs adoption and diffusion in Qatar

2.2.1. Mobile cellular subscriptions (per 100 people)

Figure 3 below reports the evolution of mobile cellular subscriptions as an indicator for Qatar and all the other GCC countries, the average Arab, MENA and world countries for comparison.

The figure shows that the number of mobile subscriptions per 100 people in Qatar is higher than that of the average Arab, MENA and world countries and amongst the highest compared to other GCC countries.

2.2.2. Individual internet users

Figure 4 shows the evolution of

individual internet users for all the GCC countries as well as the average for the MENA and world countries. Throughout the total period of our sample, the level of individual internet users is in the top three GCC countries and a level higher than the average of the MENA and world countries.

The ICTs – ED nexus

During their process of economic development, countries show an increasing trend of ICTs adoption, use, and diffusion. As the use of ICTs is generally associated with an improvement of energy efficiency and energy intensity. However, empirical studies show evidence of different types of effects of ICTs on Environmental Decay.

The positive relationship between ICT and environmental degradation defines the worst side of ICTs' impact on environmental quality. This occurs through a direct effect, which stems from the production of ICT equipment (computers, screens, etc.) and their use. Moreover, electronic waste or e-waste has increased pollution through the toxic chemicals released in air and the ones leaking into groundwater. Lastly, the increase in ICT products and applications has also increased its consumption.

The belief that ICTs will have a high negative impact on environmental degradation comes from the belief that ICTs will facilitate the decoupling of economic growth without increasing environmental degradation. The best side of ICTs is that they enable us to reduce impact on environmental degradation by making energy use more efficient, which in turn limits the emission of greenhouse gases.

The rebound effects are known to have counter-intuitive outcomes since the effects of ICTs on environmental degradation are more profound. The rebound effect corresponds in general to an effective increase in the demand

of energy service due to the drop of prices that are caused by the increase of efficiency in production and services. It is generally observed in the transportation sector, whereby drivers respond to energy-efficient cars and subsequent fuel savings by driving more, since the effective cost per kilometer is now lower. This can reduce or outweigh any benefit in emissions reductions from the more efficient engines.

Qatar ICTs Diffusion and Initiatives

The use of ICTs in Qatar is widespread. The expanding use of these technologies has been able to play a role in improving the quality of life whether in a direct manner whereby the user accesses services instantaneously, without the need to physically visit a service center or broadly encompassing all aspects through the Internet of Things (IoT) and Smart Cities.

A smart city is the one, which utilizes ICTs to enhance the quality and efficiency of urban services including energy, transportation, and connectivity. A pioneering example of smart cities lies right here in Qatar, Lusail. In Lusail, energy conservation is achieved through the district cooling system, saving around 200,000 tons of CO₂ emissions per annum by optimizing temperatures in every building individually based on the sun's angle and time of day.

The whole city is equipped with a huge IT infrastructure to run all the city's processes. Lusail aims to set the foundations for a legacy of sustainability, showing that the country's carbon footprint can be easily minimized, without compromising with one's way of life. While in fact, making it better.

A new law drafted earlier this year mandates the establishment of a new "Media City" which aims to attract international media and technology companies as well research and training institutions in

the field of digital communication. In fact, the tech giant Microsoft is to launch a global data center for "Azure Cloud Computing" based here in Qatar, which will be the first tenant of Media City.

Another important development in Qatar is the widespread use of e-government services, through applications such as Metrash2, enabling residents to access multiple services online. Furthermore, the implementation of ICTs in the health services sector through a centralized database (Cerner) in state hospitals around the country allows for improved efficiency within the system. E-commerce, on the other hand, has been gaining growing popularity among businesses on different scales.

Conclusion and Policy Implications

In the last few decades, Qatar has heavily invested in the hydrocarbon sector to ensure a high level of economic growth. This has led to many challenges in terms of environmental quality as the increasing levels of economic activity and rapid urbanization have led to a significant negative impact on air quality.

In order to improve Qatar's environmental quality, policy makers should continue investing in ICTs and mainly those with a big potential to facilitate CO₂ emissions reduction. However, policy makers should pay attention to potential rebound effects of the ongoing ICT investments and diffusion. To avoid such effects, Qatari policy makers are expected to increase the awareness of the entire population living in Qatar through increasing awareness-oriented campaigns to stimulate an efficient use of ICTs. The empirical results show that the rebound effect should be managed, since it is likely to be greater in rapidly growing markets where there is a high demand for energy and resources.

From Oil and Gas to Knowledge: Transforming Qatar into a Knowledge-Based Economy

Dr. Tarek Ben Hassen

Assistant Professor, Department of International
Affairs, CAS, Qatar University

Mrs. Fatima Al-Dhaheeri

Graduate Student in Gulf Studies, Qatar
University



conference titled: "Knowledge-based Economy in Qatar: Trends and Opportunities for Interdisciplinary Research and Policy Making".

Introduction

The hydrocarbon sector constitutes 80% of export earnings and 90% of Qatari government revenues. The high volatility of oil prices poses strong challenges to the Qatari economy. Leaders of Qatar recognized that oil and gas resources alone cannot sustain long term economic prosperity, and planned to create a diversified economy. Since, 1995, Qatar's economy has been undergoing a critical transformation towards a diversified economy, with focus on the idea of knowledge-based economy. Qatar National Vision 2030 explicitly promotes economic diversification by transforming

the economy into a knowledge-based one, to sustain growth and prosperity. Various projects have risen to boost innovation, research and development (R&D), entrepreneurship and the role of the private sector: Incubators, Science Park, Information and Communication Technology (ICT) infrastructures, and funding structures, etc.

Qatar 2030 is based on four defined pillars: Human development, social development, economic development and environmental development. Economic development, the locomotive that drives progress, is an essential pillar of Qatar

2030. It aims to provide better economic and social opportunities for the country's citizens. Qatar 2030 will manage the Qatari economy, creating an equilibrium between an oil-based and a knowledge-based economy, to attract more investors, increasing competition and stimulating development. Qatar 2030 aims to make the country a regional hub for knowledge and high-value industrial and economic activities. This goal can be achieved by supporting the private sector, promoting entrepreneurship and innovation, improving the business and investment environment, reforming the labor



Dr. Hassan Al Derham, Qatar University President, while attending the conference.

market and strengthening regional integration.

With its macroeconomic and political stability and suitable growth rates, Qatar is considered to have a solid base to make the transition to a knowledge-based economy possible. In fact, Qatar since 1995 has made important investments towards building a solid foundation for knowledge-based economy in the fields of ICT infrastructure, education, innovation and entrepreneurship.

The ICT in Qatar

ICT is considered an important sector in Qatar. Since 2004, the Qatari government adopted clear ICT policies to boost the sector and improve its governance. In 2004, ictQATAR was created as the telecommunication regulator in Qatar. In 2014, the Communications Regulatory Authority (CRA) replaced ictQATAR. Simultaneously in 2016, the Ministry of Transport and Communications was established.

According to the International Telecommunication Union (ITU) 2017 Report, Qatar ranked 39th globally on the ICT Development Index (IDI). Furthermore, a series of studies conducted by

the Ministry of Transport and Communications since 2014 revealed that households, individuals, businesses, and the government sector are more connected than ever. Today, Qatar boasts one of the highest Internet penetration rates in the world. Since 2010, internet penetration increased to near-universal levels, 96% for households and 98% for the mainstream population. Furthermore, business establishments have improved their ICT penetration and usage rates. According to the World Economic Forum's Global Competitiveness Index, Qatar ranks 18th on technology absorption at the firm level (World Economic Forum, 2018).

Human capital and education

Human capital development is another important pillar of the knowledge-based economy. Qatar National Development Strategy (2011-2016), says, "As Qatar's economy diversifies more from its reliance on gas and oil, success will increasingly depend on the ability to compete in a global knowledge economy. Educating and training Qataris to their full potential will be critical to continuing progress." With significant efforts and investments to improve its educational system, Qatar has placed education at the center of economic diversification. Today, Qatar spends 5% of its GDP on education. A substantial amount of time, energy, and resources were dedicated to education to build a modern excellent education system that provides students with a first-rate education, comparable to that offered anywhere in the world, through numerous education reforms and implementation of a new curriculum.

Innovation

Innovation is one of the basic factors for economic diversification

and a crucial driver for the knowledge-based economy. Qatar invested largely in building an innovative ecosystem over the last 20 years. This includes the creation of strong research and development (R&D) institutions and organizations such as Qatar Foundation, Qatar National Research Fund, Qatar Science and Technology Park (QSTP), and several research centers.

In 2006, Qatar Foundation established the sole research-funding agency in Qatar, the Qatar National Research Fund (QNRF). The main mission of QNRF is to fund and promote R&D in Qatar as well as international scientific cooperation to achieve a knowledge-based economy. QNRF aims to foster original and competitively selected research in the fields of engineering and technology, physical and life sciences, medicine, humanities, social sciences and arts. In 2005, QSTP was launched as the national entity charged with applied research, innovation and entrepreneurship, delivering commercialized technologies in energy, environment, and health. The Global Innovation Index (GII) of 2017, ranked Qatar at 49 of 128 countries.

Entrepreneurship

Qatar placed an increasing emphasis on the importance of small and medium-sized enterprises (SME) and entrepreneurship in the State's overall developmental plans. Qatar 2030 recognized the importance of entrepreneurship for economic diversification to reduce Qatar's dependence on hydrocarbon industries. As a result, Qatar established major support systems to raise awareness about entrepreneurship and to help entrepreneurs through significant organizations such

as incubators, Science Park and funding structures, etc., including Qatar Development Bank, Enterprise Qatar, Silatech, Social Development Center, Injaz Qatar, Center for entrepreneurship (QU), Qatar Business Incubation Centre, Digital Incubation Center and Qatar Science & Technology Park (QSTP).

Conclusion: The knowledge-based economy in Qatar, what next?

Developing a knowledge-based economy is not an easy process, particularly in a small country such as Qatar. Because of the country's commitment to hosting the FIFA World Cup in 2022, the pace of economic planning and implementation is much faster than any other GCC member state.

However, some issues need to be resolved by adopting the right policies. At the ICT level, Qatar must continue to address barriers such as high ICT costs and the need for more advanced ICT knowledge and skills across all demographic groups. Moreover, the ICT industry in Qatar is still mainly import dependent. Few ICT enterprises are involved in manufacturing ICT products.

At the educational level, one of the key challenges to achieving the goals of Qatar 2030 is "Raising the achievement of Qatari students at all levels, especially in math, science and English and, through that, increasing educational attainment of Qatari students" (GSDP 2011: 124). Thus, "Declining enrollment in science and mathematics needs to be reversed especially at the tertiary level to better fulfill the needs of knowledge-based economy industries" (GSDP 2012: 52).

At the innovation level, Qatar ranks 68th for the Innovation Efficiency Ratio, which means



Dr. Tarek Ben Hassen

lags between successful R&D efforts and the widespread adoption of innovations. In addition, companies in Qatar are more focused on the technical aspect of knowledge management without any interest in knowledge sharing or cooperation with universities.

At the entrepreneurship level, the entrepreneurship ecosystem in Qatar is facing some issues. First, entrepreneurs struggle to find adequate funding. Formal financing and especially venture capital are lacking. Second, some entrepreneurs mentioned the lack of affordable and efficient support structures such as office space, professional infrastructure (e.g., suppliers) or physical infrastructure. Third, entrepreneurship is still focusing on traditional sectors (GEM, 2016). Furthermore, due to the nature of the rentier state model, careers in the public sector are much more attractive, better paid and less onerous than that in the private sector. This reduces the incentive for Qataris to become entrepreneurs.

To support the vision of knowledge-based economy in Qatar, the Center for Gulf Studies at Qatar University organized a conference titled: "Knowledge-

based Economy in Qatar: Trends and Opportunities for Interdisciplinary Research and Policy Making". The event took place on 27th – 28th October 2019 on campus.

The main goal of this scientific conference was to bring together leading researchers and stakeholders from a range of disciplines and countries to discuss and share the most recent research results and best international practices regarding the constitutive dimensions of the knowledge-based economy namely, ICT, innovation, education and entrepreneurship.

The agenda of the conference included a session on, "Transformation into Knowledge Based Economies: Meeting structural and motivational challenges", in addition to panel discussion about "Economic diversification and Knowledge-Based Economy". Moreover, it included several research sessions that discussed different topics such as, "Innovation, R&D and Knowledge-Based Economy", "Education, learning and Knowledge-Based Economy", "Entrepreneurship and Knowledge-Based Economy", "Knowledge-Based Economy: International experiences".

Global Mental Health: A Call for Action!



Dr. Monica Zolezzi - Assistant Professor, College of Pharmacy- Qatar University

Latest global figures on the prevalence of and the burden associated with mental illness have been the focus of attention of World Health Organization (WHO) over the past decade. It is estimated, that around 1 in 7 people globally (11-18%) have been diagnosed with a mental or substance use disorder at some point in their lives. Furthermore, the global burden of disease attributed to mental disorders has risen in all countries, reflecting a neglect in the

provision of quality mental health services known to be routinely worse than those provided for physical health. The burden of mental disorders is likely to have been underestimated because of inadequate appreciation of the connection between mental illness and other health conditions.

One of Qatar's national health strategies focuses on mental health and intends to develop programs to improve the delivery of mental health services that are

focused on community-based care. The National Mental Health Strategy (NMHS), formulated in 2013, encompasses a comprehensive report to address the mental health needs of people in Qatar. It provides estimates indicating that one in five people in Qatar experience a mental illness anytime in their lives, but less than 25% of those who need mental health-care have access to it. The NMHS has also highlighted findings from local studies, indicative

that negative perceptions about mental illnesses cause people to delay or avoid seeking help.

As the social, economic, health-related and human costs of mental illnesses become better documented, global commitments to scale up mental health-care have grown. WHO introduced the Global Mental Health Action Plan 2013-2020, insisting upon member states to increase mental health-care coverage by 20% for people with serious mental illnesses. It also includes a number of key funding and policy initiatives that target persisting resource gaps in the provision and access to mental health services. This illustrates that time has come to integrate mental health-care into the broader global health agenda.

Mental health research at Qatar University

Mental health research in Qatar has been responsive to global trends and is increasingly gaining momentum over the past decade. Several research groups from an array of governmental, academic and research institutions have shown their commitment towards aligning their research agenda with the goals of NMHS. At Qatar University, the predominant focus of mental health research is currently on health services and implementation of research agenda, as well as areas that align well with the global and national efforts for closing treatment gaps.

At the College of Pharmacy (CPH), most of Dr. Monica Zolezzi's research efforts are focused on strengthening the international evidence, applying local context to research methods to increase our understanding of culturally and socially driven service gaps and translating findings into real-world interventions to promote mental health-care in the country.

As a clinical pharmacist in mental health for the past 20 years, Dr. Zolezzi's research has focused on the following:

First, addressing the medical comorbidities in people with mental illness: There is substantial evidence of premature death among people with certain psychiatric disorders. It is known that people diagnosed with schizophrenia or bipolar disorder have much shorter life expectancies. There are numerous factors, which contribute to shorter life expectancy rate in this population, most of them attributed to medical comorbidities such as heart disease and metabolic disorders like obesity and diabetes. Results from several of Dr. Zolezzi's projects have explored the rate of local prevalence of physical comorbidity among individuals with serious mental illnesses, which confirm that similar worldwide trends of inadequate medical and preventative care for people with mental illness exist in Qatar.

Second, addressing the barriers and threats to mental health: The literature also indicates that people with mental illnesses are less likely to receive physical examinations or evidence-based medications for co-existent medical conditions. Dr. Zolezzi's local research in relation to mental health stigma aims at increasing our understanding of why people with certain mental illnesses are less likely to seek help or obtain follow-up care and integrating mental health awareness into all aspects of health.

Third, addressing the multi-disciplinary nature of mental health-care and the role of pharmacists: Incorporating pharmacists into inter-professional teams in a wide spectrum of practice settings

provides expertise that is needed when facing complex medical conditions that people with mental illnesses often have.

Value provided by pharmacists includes improvements in patient symptoms, increased medication adherence rates, increased patient satisfaction and the potential to reduce health-care costs. Several of Dr. Zolezzi's projects highlight the role of pharmacists can play in the safe and effective use of psychiatric medications.

Driving change: The future of mental health research

Research improves our understanding of the causes and risk factors for mental health problems, supports promotion and prevention initiatives helping people to stay well, underpins the development and evaluation of new forms of support (psychological, social, cultural and pharmacological) and provides evidence on how innovative approaches can be put into practice in the health-care system and in wider settings.

Collaborative capacities within Qatar University to advance the mental health research agenda are currently underway. The Health Cluster recently founded the Mental Health Research Group. This will be a platform for knowledge sharing at the university, which will promote scientific discovery to help achieve the goals outlined in Qatar's NMHS. The aim is to build and consolidate the community of advocates, consumers, investigators, clinicians and policymakers united in their commitment to mitigate the suffering associated with mental illness, eliminate associated stigma, diminish their social and economic burden, and erase the social and health disparities perpetuated by poor access to high-quality mental health-care.

Novel Nanocrystalline Materials with Thermal Stability Near Their Melting Point

Dr. Khaled Youssef, Assistant Professor of Nanotechnology, led a team of Researchers at Qatar University in the Materials Science and Technology Program. They have developed novel nanocrystalline materials that have superior properties and are thermally stable up to 90% of their melting temperatures.

Nanocrystalline metals —with grain sizes < 100 nm— often have unique properties, which are superior to those of their coarse-grained (grain size > 1 mm) counterparts. These novel materials can exhibit very high strength, improved corrosion resistance, and enhanced fatigue and radiation tolerance. However, Nanocrystalline metals are inherently unstable at elevated temperature because the nano-scale grain size provides a very large driving force for grain growth. This thermal instability limits the utilization of nanomaterials in many advanced applications.

The research team members who are working with Dr. Khaled Youssef are mainly graduate students at the Materials Science and Technology Program including a PhD student, Sara Ahmed, and MSc students, Farah Elmakaty, Mohamed Abaza, and Hira Khalil. The research team was able to maintain the grain size of these metals in the nanoscale range by design engineering the grain boundaries with a trace amount of stabilizer



Dr. Khaled Youssef, Assistant Professor of Nanotechnology

atoms.

Two recent papers on the work have been published in Materials Science and Engineering A and Advanced Engineering Materials. In these papers, the nanoscale grains (~20 nm) of pure Copper were stabilized by adding only 1% Niobium. The strength of this novel nanomaterial is higher than that of high strength steel with extraordinary thermal stability up to 900°C. The endeavour is supported by the Qatar National Research Fund (a member of the Qatar Foundation), Grant no. NPRP9-180-2-094.

“These novel ideas are now expanded to lightweight metals such as aluminum,” says Dr. Khaled Youssef. In order to maintain its low density, graphene is now used to provide thermal stability and high strength in nano aluminum. We were able

to decorate the grain boundaries of nano aluminum by thin ribbons (2-3 nm) of graphene and aluminum carbide. This nano aluminum has strength values at least ten times higher than those of the conventional coarse-grained Al-alloys and are thermally stable up to 600°C (~90% of the melting temperature)”.

Dr. Khaled Youssef also says that, “there is a wide range of applications for strong, thermally stable, lightweight materials, such as for use in vehicles, aircrafts, spacecrafts, prosthetic devices, etc. We still have a lot of research to do to fully characterize these materials and explore the best processing methods to scale it up”.

Dr. Khaled Youssef says that the research will be in parallel to the recent international efforts to investigate the structure and properties of these novel nanocrystalline materials. Findings will define new design rules in the creation of single and multi-component alloy systems for advanced applications. An equally important goal is the development of intellectual resources in the form of MSc and PhD research students in the Materials Science & Technology Graduate Program at Qatar University, who will learn and develop new ideas and transfer that knowledge to Qatar industry, universities, and globally as well.

Potentials, Challenges and Opportunities for Tourism Development in Qatar

Issa Dawd, Department of Accounting and Information System, College of Business and Economics, Qatar University

Lanouar Charfeddine, Department of Finance and Economics, College of Business and Economics, Qatar University

Introduction

Qatar has experienced extraordinary development in its economic, social and environmental sectors, thus improving its worldwide ranking in several aspects. As per 2018 Statistics, Qatar ranked on the top of economies with the highest GDP per capita (PPP), \$128487.1, followed by Macao SAR in the second position with a level of GDP per capita (PPP) of \$118098.9 (International Monetary Fund, IMF, 2018). Additionally, Qatar was also ranked as the second happiest country in the Middle East and as per energy export, Qatar has maintained its position as the top liquefied natural gas (LNG) exporter in the year 2018 and it is also expected to maintain this position for at least the next 15 years.

However, sustainable development in Qatar is still facing many challenges. Due to the new global and regional geopolitical and economic context characterized by high volatility of oil prices and the multiplication of political crises in the region there is increased necessity to diversify the economy in order to reduce its dependence on the hydrocarbon sector. The other challenge is to maintain the high ranking attained by Qatar and seeking higher global ranks in terms of the business environment in the country. According to the



Dr. Issa Dawd

World Bank report of 2019, Qatar occupies the 83rd position in terms of ease of doing business. Subsequently, another challenge, which GCC countries face as a whole is reducing the level of air pollution to create a healthy environment.

The Qatar National vision 2030 identifies the tourism sector to have a promising potential to contribute in resolving the above-mentioned challenges. This article presents and discusses the potential, challenges and opportunities for the tourism industry in Qatar.

Qatar Tourism Sector in Statistics

The tourism sector in Qatar vitally supports the economic growth of the country. According to the World Travel and Tourism Council (WTTC) 2017, the tourism sector contributed QAR56.1billion to Qatar's GDP in 2016, corresponding 10.1% of the total GDP. Moreover, in 2016 the tourism industry had 10.8% of total employment, including jobs supported indirectly by the industry. By serving 2.9 million foreign tourists, this sector generated a total income of QAR41.0 billion. This income includes the

economic activities of the entire tourism industry including hotels, travel agents, airlines and other transportation services (WTTC, 2017). Additionally, according to the WTTC report 2018, Qatar's investment in the travel and tourism industry in 2017 was QAR6.2 billion, approximately 2.4% of the total investment of the country. Furthermore, the report shows that investment in the tourism sector was expected to grow by 9.2% in 2018, and by an expected annual average growth rate of 7.8% by 2028, consequently reaching 4.2% of the total investment by 2028.

Figure. 1 shows the monthly evolution of the number of tourist arrivals from January 2015 and July 2018 (Dark red line). The shaded column in the Figure shows two weeks period after the Qatar blockade from June 2017. Consequently, figure 2. Shows the impact of the blockade on the number of tourist arrivals, resulting in a decline by an approximate of more than 150000 tourists in the first three months of the Blockade. In the last half of 2017, the number of tourist arrivals showed an increase, however April to July 2018 experienced a fall.

Although there was a significant increase in the number of tourist arrivals after the blockade, figure.2 shows that the average room occupancy remains constant during this period. The results represent that hotels perform better than expected after the blockade, given the increase in the level of average room occupancy to 60%. This could be due to the support and promotion of internal tourism. Overall, the operational performance analysis of hotel types shows that the occupancy rate of the rooms remained constant during all the periods of the study except for in 3-star hotels. The three types of hotels; 1 and 2, 4 and 5 are seen to decline slightly, this may be linked to external

factors such as the decreasing oil prices in 2014, having a significant impact on the number of tourist arrivals in the GCC region.

Qatar Tourism Sector Potential and Ambitions

Taking into consideration the potential and advantages of the Qatar tourism sector, the policy-makers and government see that tourism sector can play an important role in diversifying Qatar's economy. The main goal is achieving the mission of turning Qatar into a tourism hub by 2030 (Hospitality Qatar, 2016). One of the remarkable targets of the Qatar government is to attract 7 million visitors by 2030 as compared to previous numbers, 2.9 million and 2.25 million in 2016 and 2017 respectively.

Promoting the Tourism Sector

In the previous years, measures have been taken to promote Qatar's tourism sector. For instance, in 2016, The Qatar Tourism Authority (QTA) established offices in different countries around the world like Istanbul, New York and representative offices in London, Paris, Beijing, Berlin and Singapore, serving the purpose of promoting Qatar as a global tourist destination. In November 2016, the Qatar government decided to extend the transit visa scheme, providing those travelling through Hamad International Airport a transit time of 5 hours to 96 hours of stay in the country. Recently, in August 2017, Qatar waived visas for citizens from almost 80 countries, making Qatar the most open country in the GCC region.

The Role of Innovation

Qatar has adopted a number of innovative measures in order to develop and grow its tourism sector. These measures serve the purpose of overcoming and averting the impact of the unjust blockade imposed on Qatar by

its neighbors and other countries, and creating a competitive tourism environment, by helping to reduce costs as well as improve output quality. These new measures in the hotel and tourism sector will increase efficiency and flexibility, thereby increasing the overall income of the hotel and tourism industry.

Qatar's main objective of promoting the tourism sector goes beyond reaching a high number of tourist arrivals, as the Qatar National Vision (QNV) 2030 envisions delivering the best experience to travelers by using the latest technology that ensures sustainability of the tourism sector. According to International Quality and Productivity Center (IQPC) (2016), foreign and local hotels in the country should support the strategy of implementing innovative technologies helping them reduce the operational costs thereby increasing guest satisfaction.

Qatar's efforts to improve the hotel and tourism sector is quite evident, due to the fact, that the in-room controls give guests access to cloud-based technologies. Secondly, the Qatar Business Incubation Center (QBIC) along with the Qatar Tourism Authority (QTA) build services and products that improve the tourism experience in Qatar.

Additionally, with the QNV 2030 in mind, Qatar also intends to develop more diverse tourism products. As a result, Qatar has invested in a significant potential industry, the cruise industry (Oxford Business Group). In 2016, QTA signed an agreement with a leading tourism group, which specializes in tourism transportation. The aim was to bring seven ships to Qatar's ports in 2017/18, which along with other parties will be extended to around 40 vessels carrying 300000 passengers by 2019/20.

Qatar Tourism Sector Challenges

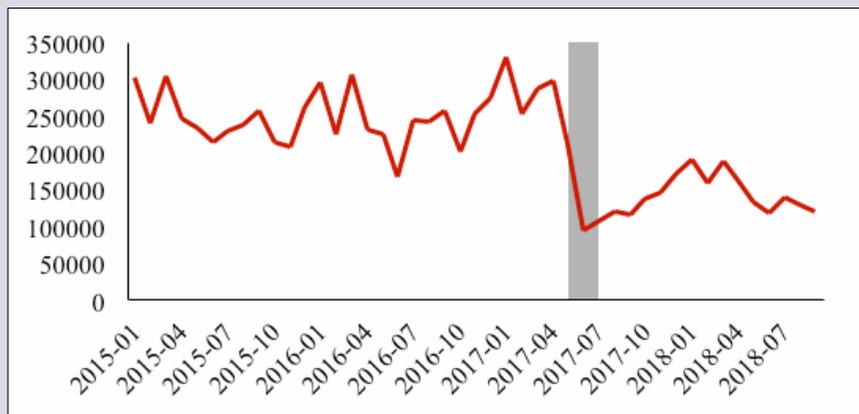


Figure 1: Tourist arrivals to Qatar between January 2015 and September 2018. Shaded area corresponds to the period of the June 2017 Qatar economic Blockade
Data source: Ministry of Development Planning and Statistics and World Bank.

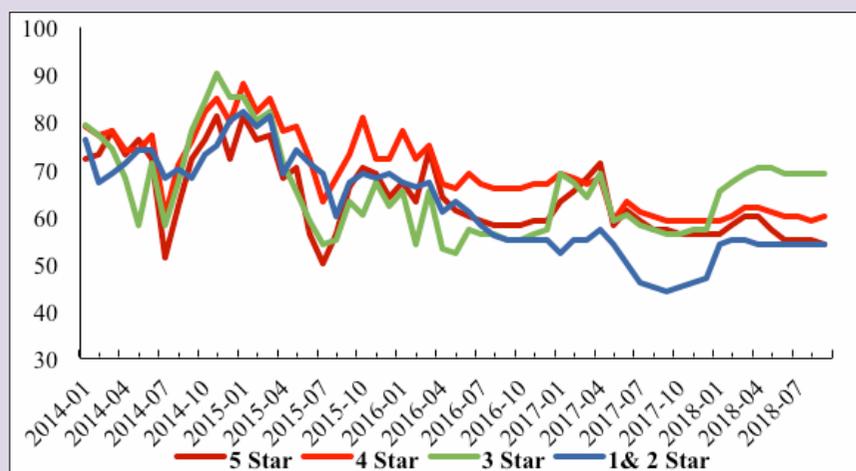


Figure 2: Qatar hotels room occupancy by hotel category
Data source: Ministry of Development Planning and Statistics and World Bank

The tourism industry faces a number of challenges in Qatar, classified as below in categories:

Short-term Challenges

Despite of the tourism facilities available in Qatar, such as sports, luxury shopping, hotels, conferences etc., there are certain short-term challenges to consider. Firstly, in order for the tourism industry to grow, reducing the negative impact of the ongoing blockade is important. Instead, Qatar can diversify the tourist arrivals from different nationalities. Consequently, the Qatari government has taken a number of measures to overcome this issue and shown resilient potential

in overcoming the effects of the blockade.

Medium-term Challenges

In 2022, fans from all over the world will arrive in Qatar to celebrate the FIFA world cup. This accounts for identifying innovative ways of offering world-class service to the guests which can help in attracting tourists even post the FIFA Qatar 2022 world cup. For example, the QTA is facing challenges in developing the infrastructure and rooms for the FIFA world cup, as there is an increase in the hotel accommodation supply (Deloitte, 2014) and business visits to the country related to the world cup. Currently, 26,653 rooms are

available in the market, however, by the world cup, the demand for hotel room accommodations will increase to approximately 33,000. QTA also identifies the culture and heritage in Qatar as a challenge during the period of the world cup, thereby taking the responsibility to project ideas and ways to show the beautiful Qatari culture and heritage, thus creating a memorable experience for visitors.

Long-term challenges

Sustaining and maintaining the tourism sector, which is considered as one of the most significant contributors to Qatar's economic growth, is itself a long-term challenge. Qatari policy makers should design appropriate strategies to benefit from hosting the FIFA World cup 2022, and create an attractive image of the country. By supporting the tourism sector even after the FIFA world cup, Qatar can increase the sustainability of a robust tourism sector in the long term.

Conclusion

The developments in the tourism industry as one of the most rapidly growing sectors in Qatar, will account for more employment opportunities and enhance the country's economic development. All the different tourism facilities in the state such as sports, luxury shopping, hotels, conferences etc. prove that Qatar has the potential to enhance tourism industry. Although, the government has formulated different policies and framed various regulations to support the development of tourism sector, however, Qatar still faces some challenges due to the blockade. Therefore, with more attention, the right effort and adequately designed strategies the tourism sector can be improved and maintained, which will, in turn, contribute to Qatar's economic growth.

Experimental Linguistics and the Structure of Arabic

Dr. Michael Grosvald,
Department of English Literature
and Linguistics- College of Arts
and Sciences, Qatar University

Experimental linguistics offers tools which enable us to better understand how language is stored and processed in the brain. In the Language Laboratory housed within the Department of English Literature and Linguistics (DELL), a number of research projects are exploring the psychological underpinnings of linguistic structure specific to Arabic and other languages. Such research includes analysis at the level of sentences, words and individual sounds (i.e. consonants and vowels). These levels correspond, respectively, to the subfields of linguistics called syntax, morphology and phonology.

Sentence-level processing

Dr. Tariq Khwaileh and I recently carried out a study in which we explored sentence-level processing in English-Arabic bilinguals. We wished to test the notion, famously proposed by Noam Chomsky, that all languages share a common underlying structure, despite their obvious surface-level differences. For example, both English and Arabic have active and passive voice, as in “John kicked the ball” (active) versus “The ball was kicked by John” (passive). However, the way that passives are constructed in the two languages is very different. English uses a different sentence construction for passives compared to actives, with passives incorporating a form of “to be” plus a participle (e.g. “was” + “kicked”). In contrast, active and passive sentences in Arabic can have the same word order (verb,



Dr. Michael Grosvald

then subject, then object), with just the vowel pattern of the verb distinguishing between the active and passive voice.

Our experiment involved the phenomenon of priming, which refers to the fact that when similar stimuli are presented back-to-back, the second stimulus can be psychologically processed more quickly than it would be otherwise. The reaction time (also called response time, RT) for a person responding to a stimulus that has just been preceded by a similar stimulus will thus tend to be faster than it would be in a neutral context. By making statistical comparisons of RTs in various conditions, we can determine how different kinds of linguistic information is stored and processed in the brain. There are numerous kinds of priming, including semantic (involving related meanings), phonological (related sounds), or in the present case, syntactic (related sentence structure).

In our study, subjects read a series of English and Arabic sentences presented on-screen in the active or passive voice. The language and

voice were determined randomly sentence by sentence, so that subjects could not know ahead of time the language or voice of the upcoming stimulus. After each sentence, a quick comprehension question was asked, which subjects answered by pressing a response button. Our expectation was that back-to-back sentences of the same language and same voice would result in priming. For example, an English passive sentence that was preceded by another English passive sentence should have a faster RT than if it were preceded by a non-passive sentence, because of the structural similarity of the two passive sentences. However, a key question is whether back-to-back sentences of the same voice but different languages will also show priming. According to Chomsky’s theory, priming should still be seen, because the theory asserts that analogous linguistic constructions like passives have a common underlying structure independent of language.

However, the data we obtained showed strong syntactic priming only within languages, not across them. In other words, consecutive sentences of the same voice resulted in priming when both sentences were in English or both in Arabic, but not when the sentences were of different languages. These results therefore do not support the Chomskyan viewpoint.

Reading at the word level

Another set of experiments in our laboratory investigates the processing of Arabic at the word level. Dr. Ali Idrissi and I have been collecting experimental data in collaboration with a number of current and former students. These include two recently graduated

DELL students, Sarah Al-Alami and Leen Hasso, and four current students supported by a student research grant: Noora Al-Ansari, Salma Abdo, Dalia Ahmad, and Shahed Al-khatib.

One ongoing project examines how written Arabic is processed by native readers. In the Arabic orthographic (writing) system, consonants and long vowels are written, while the small diacritics indicating short vowels are generally omitted. Although this situation is well known, the specific role that diacritics play in the processing of written Arabic words has not been extensively investigated.

In one experiment, we had subjects perform a lexical decision task. This means that subjects see a series of real word and fake word stimuli presented on-screen, and for each stimulus, they are asked to hit one button to indicate, “Yes, it’s a word” and another button to indicate, “No, it’s not a real word.” For example, “chair” is a real English word while “blurk” is a non-word. In our experiment, the word and non-word stimuli varied according to three factors: (1) lexicality (i.e. being a word or not a word), (2) the presence or absence of diacritics (also called “voweling”), and (3) orthographic ambiguity. Ambiguity refers to the fact that some written forms without diacritics may represent multiple, non-homonymic words, as with the word-form <k-t-b> (كتب), which has multiple readings including [kutiba] “it was written,” [kataba] “he wrote,” and [kutub] “books.”

Even though short vowel diacritics provide additional information which might be expected to make access to the target word entry easier, the presence of diacritics greatly slowed our participants’ RTs across all conditions. Our results did not show any beneficial effect of vowel diacritics in the accessing of ambiguous words. This suggests that in cases of ambiguity, Arabic readers may simply fall back on the

default (most common) reading of a written word-form, without paying attention to the diacritics.

Language sounds – consonants and vowels

Research at DELL also includes investigations at the level of individual consonants and vowels. One paper published last year was co-authored with a recently graduated Capstone student, Sarah Ahmed, and was about the phenomenon of coarticulation. This refers to the fact that in the flow of speech, successive sounds are not produced unit-by-unit but are rather fused or “blended” together. This has numerous implications in areas as diverse as computational linguistics, word and sentence processing, and language change over historical time. Moreover, coarticulation affects not just adjacent sounds, but can spread over considerable distances.

Our study investigated coarticulation in Arabic, and had a number of novel findings, presented very briefly here. First, the coarticulatory influence of one Arabic vowel on

another can extend across multiple syllables. Second, these effects do not seem to be blocked or otherwise influenced by long consonants (also called “doubled” consonants, i.e. the ones indicated with a shadda in written Arabic). Finally, there is strong evidence that tafkhim (“emphatic”) consonants exert very powerful coarticulatory effects on adjacent as well as non-adjacent vowel sounds. Many of these findings are provocative, and it is hoped that they can be developed further in subsequent studies.

Other work

The projects described here are just a sample of the work being carried out in DELL’s Language Laboratory. For example, another series of experiments uses event-related potentials (ERP) methodology to measure brain activity during the processing of Arabic linguistic stimuli. Future plans include research combining experimental and sociological (socio-linguistic) methods, as well as a psycho-linguistic exploration of languages related to Arabic.



Cyber Week 2019

27-31 October, 2019-3rd Edition



Dr. Hassan Al-Dirham, Qatar University President giving a speech at the Syber Week 2019

CYBER WEEK

Cyber Week, organized by KINDI Center for Computing Research at the College of Engineering, Qatar University, is an annual event that aims to raise cybersecurity awareness in Qatar through numerous activities, with an aim to discuss current challenges and future global trends related to cybersecurity and privacy.

Cyber Week 3rd edition was an one-week event that had several initiatives including Cyber Conference, Cyber Women, Cyber Youth, Cyber Academy and Cyber Challenge. It was sponsored by Qatar National Research Fund (QNRF), Dolphin and Thales. This brought together cyber-security experts from Academia, Industry, and Government to meet, discuss, share ideas, and establish contacts. The event provided a platform

for discussing the latest cyber-attacks and efforts towards tackling emerging cyber security threats.

The Cyber Women 2019 initiative was supported by NATO- Science for Peace and Security (SPS) and the Cyber Security for Emerging Technologies (CSET) was sponsored by Institute of Electrical and Electronics Engineers (IEEE). It included keynotes and panel discussions with speakers from local and international organizations, as well as hands-on training and awareness sessions about cybersecurity to experts and students, along with demos and posters sessions. Cyber week also included training sessions by Thales and CTF competition. Cyber Week explored the following topics:

- Cyber Resilience in Financial Technologies (FINTECH).
- Emerging security threats and mit-

igation mechanisms in Industrial Control Systems (ICS).

Security Attacks and Secure Cloud Computing Architectures.

Secure Internet of Things (IoT) Architectures threats.

Cyber Threat Intelligence.

Security Threats in Big Data.

Usability, legal, and Economic aspects of Cyber Security.

INTERNATIONAL CONFERENCE ON CYBER SECURITY FOR EMERGING TECHNOLOGIES, 27TH – 28TH OCTOBER, 2019- CSET'19

The International Conference on Cyber Security for Emerging Technologies (CSET'19) sponsored by IEEE is where researchers, as well as practitioners in cyber security, come to present and discuss their researches and share experience.

The event is aimed at providing an opportunity to experts in cyber threat analysis, operations, and research to coordinate their efforts towards addressing the dynamic challenges in cyber security for emerging technologies. Businesses and government entities are becoming more reliant on emerging technologies such as finance management systems, industrial control systems, cloud computing services, and IoT devices for health. Cyberattacks compromising such critical infrastructures can have significant economic and safety impact. National and international experts have the opportunity to present state of the art approaches and best practices in the industry to deal with such attacks.

CYBER WOMEN, 30th-31st OCTOBER, 2019

Cyber Women (2019), supported by the NATO (North Atlantic Treaty Organisation) Science for Peace and Security Programme and co-organized by GEODE at Paris 8 University, is aligned with Qatar's National Vision 2030, on increasing the opportunities and vocational support for Qatari women.

Cyber Women, is an initiative to inspire, encourage and empower

women in cyber security by highlighting role models who share inspiring success stories and bring women from NATO countries and partners together to network, communicate and share knowledge about their respective fields.

The United Nations Security Council (UNSC) Resolution 1325 on Women, Peace and Security acknowledges the importance of the participation of women and the inclusion of a gender perspective in preventing, managing, and resolving conflicts and maintaining international peace and security. Yet according to Women's Society of Cyberjutsu (WSC), women are only 11% of the world's information security workforce.

Empowering women in the cyber security field has become an inevitable topic in today's world where cyber-attacks are constantly on the rise. Threats such as cyber warfare will require a wider range of skills composed of diverse and gender balanced teams, as noted in the report "UNSCR1325-Reload" from NATO SPS. Thus, the small representation of women in cyber security is all the more regrettable when the world is facing severe labor shortage in that area.

The aim of Women in Cyber Security Conference is:

To encourage and empower women in cyber security by highlighting role models who would share inspiring success stories.

To bring women from NATO countries and partners together to network, communicate and share knowledge about their field.

Cybersecurity is one of the main priorities for NATO and its partners such as Qatar and the participation of women in the cybersecurity workforce is an essential step towards ensuring security in the region. The "Women in Cyber Security" conference (Cyber Women) will serve as an interdisciplinary platform, which will address technological and policy aspects of cyber-security. The event will have a major regional impact since it will be the first of its kind in the region.

The intended audience will be high-level decision makers from NATO countries and the Middle East/East Europe region, researchers, cyber-security policy makers and students.

Along with KINDI, Thales will co-organize three events:

Cyber Academy (29 Oct, 2019) - This initiative is focused to equip cyber-security experts with new knowledge on the emerging technologies using state of the art labs and tools.

Cyber Youth (29th Oct, 2019) - The Cyber Youth initiative offers a program for students where they can come to learn about specific topics in cyber-security. At the end of the program, the students will be participating in a contest.

Cyber Challenge (30th Oct, 2019) - This initiative is set up to raise the cyber-security awareness and to open the door for the students to enter the cyber-security world, as they are Qatar's future.



Stakeholders exploring the exhibition booths

Empower Generations Consortium For National Capacity in Life Sciences **College of Health Sciences and the Biomedical Research Center, Qatar University**



Dr. Hassan Al-Dirham and Dr. Mariam Al-Madeed together with group of the students and professors participating in the Empower Generations Consortium

Empower Generations Consortium (EGC) solely aims to enhance the conceptual development of life sciences and grant youths the career guidance that helps them to dynamically engage with societies, build their inner strengths, reshape their self-confidence, enhance their competency levels, improve their interpersonal skills, build in them the desire towards social contribution and influence their adeptness to surroundings. The said goals are modelled through a number of educational schemes within the consortium. The operating projects under the consortium are firmly aligned with the Sustainable Development Goals for 2030 Agenda and Qatar vision 2030. It enterprises the investment in youths to shape stronger societies through several national and international collaborations in

science education.

The consortium functions within a broad range of educational and social contexts. It transforms the theoretical and blind science to a more interactive means of education. It plays a substantial role to achieve local equity and employability in careers related to life sciences, health occupation, research and works in line with Qatar National Strategy and vision 2030.

It is the only project-based consortium, which tackles career related challenges from the secondary education platform and connects bridges between schools, universities, employments and national demands. The project facilitates genuine engagement of high school students with professors and researchers, helps

the new generation to meet their role models at various healthcare facilities, strengthens national commitments and re-enforces responsibility. Eventually, the project strives to invest in our youths in order to build a secure base of national human resources and create a culture of productivity. EGC's vision is based upon building national capacity in careers related to life sciences, providing career-oriented solutions that enforce efficiency, accountability and educational worth. The first line beneficiaries of the consortium are the high school students, of grades 10, 11 and 12, who do or do not have interest in life sciences and healthcare careers. Subsequently, the schools, science educators, healthcare sector, research centers get directly influenced from the all-



Honored female participant students

encompassing deliverables and outcomes.

The consortium functions in collaboration with several business partners, such as the Ministry of Education and Higher Education (and all the high schools across Qatar), Hamad Medical Corporation (eight hospitals), Qatar Biobank-Qatar Foundation, Sidra Medical and Research Center, Al-Gannas Qatari Society, Qatar Genome-Qatar Foundation, Ministry of Public Health, Ministry of Administration Development Labor and Social Affairs, Primary Healthcare Corporation and the Equine Veterinary Medical Center-Qatar Foundation

Speaking about the impact, so far, 480 students participated from 2013 to 2017 and more than 3500 students were impacted. The project has reached to 100% of the

schools in Qatar and achieved 93% of participation. Documented 10% annual increase in science majors enrollment at Qatar University (9% in 2013, 19.6% in 2014, 21% in 2015, 37% in 2016 and 46% in 2017). This reflects 6.5-8% increase in the entry level to the science and healthcare sector in 2022.

Up to date, 47.4% of the College of Health Sciences and 59.7% of the QU-health cluster students have been enrolled in this project. In addition, 17% of the enrolled students have chosen careers in natural science and engineering. Average of the satisfaction survey is 4.7/5 and increased annual participations in the project stand at the rate of 30% (started with 12 students in 2013 and 110 students in 2017).

Empower Generations Consortium

is located in Qatar University, operated jointly under the umbrella of the College of Health Sciences and the Biomedical Research Center.

The consortium operates three projects:

Science Education and Human Health Activities (SEHHA) Project.

Qatar Scientists in Biodiversity (QSBID) Project.

Genomics and Precision Medicine (GPM) Project.

The three projects are operated annually from September to November in parallel to each other. Each project has a competencies scheme from level 1 to level 4. The instructional locations vary according to the project vs the level of competency.

SEHHA-QSBID Dual Project functions under the consortium's umbrella; it has recently won a Bronze for category of the Middle East Regional award at QS-Reimagine, San Francisco- USA in 2018. Reimagine celebrates and rewards the most successful educational and innovative projects that enhance learning outcomes and employability through the annual conference.

The project has also been endorsed by the Ministry of Education and Higher Education in Qatar as a lead source for building national capacity in life and biomedical sciences.



A trainee student during training on the project.

Annual Research Forum & Exhibition 2019

The First Day of the Annual Research Forum & Exhibition 2019 “First Version of tadTalks”



International students participating in tadTalks along with Prof. Mariam Al Maadeed, Prof. Ahmed Elzatahry and Dr. Mary Newsome

Due to the belief in value of the individual in society and the keenness of investing in individual energies, Qatar University (QU) ensured that the first day of the Annual Research Forum and Exhibition held on April 23, 2019 shall focus on students pursuing postgraduate studies. The event featured tadTalks for graduate students on the theme “Resilience in Research,” in the presence of Professor Mariam Al-Ali Al-Maadeed, Vice President for Research and Graduate Studies and a number of senior representatives from different educational institutes around Qatar.

During the tadTalks, a group of students participated in the sessions from QU, Qatar Foundation, Hamad Bin Khalifa University, Doha Institute for Graduate Studies and from the United States of America, Canada,

Netherlands, Turkey, Japan and Australia.

The event also featured rally driver and champion of World Desert Rally Championship (Cross-Country) Mohammed Al-Mannai. He is considered as an example of persistence, determination and a man known for confronting difficulties. After being injured in a rally accident, Mohammed kept competing and became an icon and influencer in the community through speaking of his journey in local schools, newspapers and television, highlighting the importance of willingness to achieve ones goal and its power. In addition, he overcame many challenges, most notably in the world championship 2015.

In her opening speech during the forum, Professor Mariam Al-Ali Al-Maadeed said that, “progress in civilization depends on human

construction. For this reason, we created this research forum, which features an elite group of students from Qatar and abroad in tadTalks discussions targeting postgraduate students. It is a trademark for Qatar University.”

She added that, “technology is a gift, but man is the most important gift, without whom there would be no innovation or transformation. We are thrilled to be here today and take part in discussions with our fellow academics and talented students, under the slogan of Resilience in Research. To excel is the basic purpose of achieving progress. We are also pleased for the participation of rally champion, Mohammed Al-Mannai, who spoke about his journey in persistence to achieve his goals despite all challenges and difficulties.”

The attendees who spoke at

tadTalks are as follows:

Manal Othman, PhD student at the Faculty of Medicine at Qatar University, who holds the post of Director of Diabetes Education in Hamad Medical Corporation, and is a member of the scientific committee of Qatar Diabetes Association as well as head of education committee in Qatar Metabolism Institute. Mrs. Manal developed the first advanced diploma for diabetic education in Qatar in collaboration with College of the North Atlantic. Moreover, she has published four research papers in international magazines about prevalence of diabetes and metabolic syndrome among Qatari people.

Among the attendees who spoke at tadTalks was Mrs. Nagla Al-Gaber, Land Transportation Planning specialist of Ministry of Transport and Communications. A graduate from Qatar University in 2011, she has worked as planning researcher for two years in the Supreme Council for Family Affairs in the state of Qatar, and on 2014, she returned to her current job. As of January 2017, she held the functions of systems and is the policies official in Land Transportation Planning Department of the Ministry of Transport and Communications, after that she obtained a masters degree in public policies from Doha Institute for Graduate Studies in 2018.

Among the speakers was also, Mohamed El-Hag, PhD student of Sustainable Energy Program at the Faculty of Sciences and Engineering at Hamad Bin Khalifa University. He has obtained his masters degree in Energy Technology from University Kebangsaan Malaysia, and bachelors in Mechatronics Engineering from University of Nottingham.

In his doctoral thesis. He has received many awards for working on technical capabilities of Solar Desalination, its environmental effects and economic viability. Mohamed is the founder of Suda-Solar educational initiative (www.Suda.Solar), thriving to increase awareness regarding renewable-

energy technology and its role in sustainable development.

Mr. Henry Yu, PhD candidate at the Faculty of Medicine, Experimental Medicine Department at McGill University in Montreal, Canada was also one of the attendees. He completed his bachelors degree from Cornell University (New York – United States of America) in Molecular and Cellular Biology. Most of his research interest is focused on the development of experimental medicine for the treatment of chronic diseases, such as metastatic breast cancer (called secondary or advanced breast cancer) and thyroid cancer. His current research aims at determining new chemical inhibitors, selectively targeting cells similar to stem cells cancer together with discovering new molecular courses and mechanisms organizing the group of stem cancer cells. Routinely, he uses Flow Cytometry, a technique for counting and examining the microscopic particles, as it is used in the diagnosis of cancer diseases for limiting the production of the gene causing it, a process known as “genetic knockdowns.”

Mr. Zeng Lu, a student in the fourth year of doctoral program in Chemical and Molecular Biology Engineering in California University, Los Angeles spoke at the forum too. His research interests mainly focus on Engineering Installation and Design of Materials, such as functional metal and organic frameworks for storing energy and transforming it, including Lithium batteries and medium heat fuel cells.

One of the speakers was Naomi Boyd, a medicine student at University of Groningen in the Netherlands. She has received a global bachelor degree in medicine in 2015, and she was among the first to work as an Associate Professor in Postgraduate Studies at the Faculty of Medicine in Qatar University. Mrs. Naomi had preliminarily spent the last two years in training and medical shifts in hospitals and worked on her research in her free time. Naomi is

now at the final stage of her shifts in Ghana, in order to complete her medical certificate by 2020.

Jean Sakida, from the Waseda University in Japan, a doctoral student specialized in the study of Robots and works for Takanashi University also took part in the event. Mr. Jean has various researches published in his name at the International Conference on Chemical Engineering and he works currently on projects related to Robots and Dentistry.

Eventually, Mr. Anish Men, holder of a master degree from Columbia University at New York and now seeking to obtain PhD in engineering from Global Innovation Center for nanoparticles at Newcastle University, Australia spoke at the forum. His research interests include Nanoparticles Synthesis and Industrial Stimulation. His core interest is to benefit from education platforms and use the experience as a tool for contributing to technology progress in society and building a better world.

In the meantime, the program also saw a panel discussion regarding arbitration, or what is also called peer review. The discussion was headed by Dr. Talal Al-Emady, Director of Qatar University Press, with Mr. Patrick Alexander, Director of Pennsylvania State University Press, Dr. Abdullah Badahdah, Professor of Sociology and Rural Studies at South Dakota State University, Dr. Francis Butshaway, Professor of Private Law at the Faculty of Law, Qatar University, Mr. Micheal Killer, Stanford University Vice-Chancellor, Batool Doghan, PhD student in Gulf Studies Center, Qatar University and Mr. Mohamed Me’arag, PhD student in electrical engineering, Qatar University.

At the end of the program, an award ceremony was also held:

First: Visual Representations Challenge award:

Photography Class: Dr. Marc Migour, Associate Professor in Architecture and Urban Planning, Faculty of Engineering.

Project: Recording events and movements of social life in public

areas of Doha.

Video class: Hamdah Mohamed Abo-Gassoum.

Title: Researcher daily life.

Means of interaction class has been obtained by research team as follows:

Dr. Abdulghany Karkar – Dr. Somaya Al-Maadeed – Gayakanth Kanouth.

Title: Computer vision in depending on portal programs applications of internal browsing for persons suffering from visual disability.

Virtual reality class: Dr. Elham Ghazy Mohamed – Yousef Ayesh, Lecturer of Educational Sciences, Faculty of Education.

Title: Virtual reality in Chemistry. Second: Winners of Training Tad Camp Awards

Sciences and engineering class:

First place winner: Sarah Obeid Sheikh, masters student, Faculty of Engineering.

Second place winner: Sawsan Al-Meqdad, masters student, Faculty of Pharmacy.

Third place winner: Al-Sayed Abdullah Al-Moa'amen, PhD student, Faculty of Engineering.

Social and Human Sciences:

First place winner: Btool Al-Khateeb, masters student, Faculty of Education.

Second place winner: Mariam Mabrouk, masters student, Faculty of Education.

Third: Award of The Best Short Content of a Thesis (3 minutes):

First place winner: Dana Hamza Al-Khalifa, Faculty of Pharmacy.

Second place winner: Rima Saleh Al-Maney, Faculty of Law.

Third place winner: Doaa Waleed Al-Sadek, College of Health Sciences.

To this extent, the events of the first day of the Annual Research Forum and Exhibition 2019 of Qatar University ended under the auspices of Qatar Petroleum, Dolphin Energy, Shell Oil Company and “Accessible Qatar” initiative.

Qatar University concludes the Annual Research Forum and Exhibition events

Under the slogan of research transformation through fourth industrial revolution “challenges and social innovations”, the second day of the Annual Research Forum and Exhibition 2019 organized by Qatar University on April 23-24, 2019 was concluded with the presence of Dr. Hassan Rashid Al-Derham, President of the University, Professor. Mariam Al-Ali Al-Maadeed, Vice President for Research and Graduate Studies, number of researchers and individuals interested in the field of research and postgraduate studies and representatives of the Annual Research Forum and Exhibition sponsored companies, namely Qatar Petroleum and Dolphin Energy (Platinum Sponsor), Shell Oil Company (Golden Sponsor) and Sasol (Silver Sponsor).

In his welcoming statement, Dr. Hassan Rashid Al-Derham, President of the University said that, “as part of its relentless endeavor to serve the Qatari community,

and the strategy to contribute to Qatar’s overall renaissance, Qatar University is organizing the Annual Research Forum and Exhibition 2019, which is an important research and educational event, in which students, researchers and academics from the ten faculties of the University, centers, institutes, partners and owners can interact. The two-day forum, with presentations, panel discussions, research presentations, and a poster exhibition, is an opportunity to discuss current research projects, implement new programs, and provide opportunities for collaboration, innovation and other projects related to Qatar University’s Scientific Research Roadmap 2014-2019 and Qatar National Research Strategy. This forum will undoubtedly provide a fertile ground for identifying the actual research needs of the State to achieve the most important research accomplishments through the selection of the most urgent research projects for the Qatari community. This forum aims to showcase the mechanism followed by Qatar University in addressing the issues and challenges facing the community, through research based and active partnerships with industry and other stakeholders, including institutions and research centers. In doing so, Qatar University seeks to promote a culture of research-based learning, exploration and entrepreneurship development. This forum will also help researchers and students at the University to take advantage of the opportunities offered by the partners involved, and will highlight Qatar University’s important and award-winning researches that illustrate the its vision and supports Qatar’s research priorities in the areas of water security, energy security, cybersecurity, social priorities and health, as well as the goals of Qatar National Vision 2030.”

Al-Derham added that, “ it is important to note that the number of research publications at Qatar University have increased from 235 in 2010 to 1,560 in 2018,



tadTalks hosts Mr. Mohammed Al-Mannai, the Qatari Rally Champion.



One of the panel discussions during the forum

an increase of 662%, and the significant difference between the two figures indicates the amount of effort exerted at Qatar University to develop scientific research. Indeed, scientific research cannot be effectively developed, apart from graduate programs. From only one program in 2002, the MBA program, the number jumped to 54 postgraduate programs, including doctoral, master's, diploma and specialized degrees."

On her part, Professor Mariam Al-Ali Al-Maadeed, Vice President for Research and Graduate Studies provided an overview of Qatar University's research and graduate activities, and its development at the local and international levels, based on the vision and mission of Qatar University and its strategic objectives in supporting the culture of innovation, and to ensure the sustainability of support, development and excellence in research and graduate studies. She also threw some light on the structure of the Office of Research and Graduate Studies, research centers, academic and technical units in addition to postgraduate programs, projects, grants, co-financing, policies, related actions, achievements at the level of the University's global and regional rankings, research production, publications, partnerships, MOUs, local and global cooperation, leading to the establishment of Qatar University Press, and other achievements, performance and efforts to develop and achieve the

strategic objectives of the University to be a destination of choice for researchers and students from different parts of the world.

A part of the event included the award ceremony, as Prof. Mustafa Serkan Kiraniyaz, of the Faculty of Engineering, in Science and Engineering, Dr. Ahmed Oweisi, from Faculty of Pharmacy in the field of Medical Sciences, Biomedical and Health, and Dr. Nour Sharaf El Din, from the Faculty of Management and Economics in the field of Humanities and Social Sciences received research excellence awards.

Moreover, the winners of distinguished scientific paper awards, distinguished thesis and dissertation awards, research posters awards, participating in the forum and receivers of awards bestowed to Barzan and Qatar Petroleum were honored together with the speakers of tadTalks. Various research papers were presented and panel discussions made by global and local specialized researchers. Notable among them by Dr. Sudarsan Rachuri, Head of the Federal Program of the United States Department of Energy, who spoke about: "Smart and Advanced Industrial Innovation - Are We Upgrading the Potential?"

There was a panel discussion on innovation and research under the slogan "Made in Qatar", the moderator was Dr. Abdullah Al-Ali, Head of Technology Innovation and Engineering Education at the Faculty of Engineering, Mr. Sinan

Al-Obaidi, Senior Research and Development Specialist, Barzan Holding, Mr. Saif Mansour Al-Khalidi, Vice President for Strategic and Institutional affairs, Suhail Sat, Dr. Basil Shadid, Director of Industrial Investment Department, Gulf Organization for Industrial Consulting, Mr. Nasser Al-Khalaf, General Manager, Aggreko, Dr. Saeed Al-Meer, Assistant Professor of Chemistry, Faculty of Arts and Sciences, Qatar University and student Latifa Al-Mohannadi, Faculty of Medicine, Qatar University.

A panel discussion titled "Social Innovation" witnessed the participation of Dr. Maha Al-Hindawi, Associate Professor of Education, Faculty of Education, Prof. Ragab Shanturk, President of Ibn Khaldun University, Turkey, Dr. Majid Al-Ansari, Head of Policy Department, Institute of Social and Economic Survey Research, Dr. Massimo Baba, Professor of Sharia and Islamic Legal Systems, University of Rome Tor Vergata, Italy and Sarah Sallabi, a graduate student at the Faculty of Law.

Another panel discussion, "promoting the Sustainability of International Research Cooperation" was moderated by Dr. Soso Zagher, Assistant Professor of Microbiology, Faculty of Medicine, with the participation of a range of international partners; Dr. Zulkafli Abdul Razak, President of the International Islamic University of Malaysia, Dr. Ghaith Al-Rabadi, Vice President for Research and Development, Princess Sumaya University for Technology, Jordan, Dr. Loredana Santo, Professor of Manufacturing Operations, University of Rome Tor Vergata, Italy, Nada Al-Emadi, and Duha Awwad, from the postgraduate program of the College of Health Sciences.

It is worth mentioning that on the sidelines of the forum, the research poster exhibition was convened, and the forum included wards for centers, faculties and supporting entities in research, in particular regarding the subject of fourth industrial revolution.

Qatar University's Central Lab Unit (CLU)

Central Lab Unit (CLU) is supervised by the Office of Vice President for Research and Graduate Studies at Qatar University (QU). It is a non-profit service unit and one of the main pillars of QU's research activities. It provides all types of technical and consultancy support to faculty staff, researchers and students inside and outside the QU and at the level of relevant state authorities. In addition, CLU meets all their scientific, laboratory and analytical requirements by using a highly experienced team of researchers, chemists, technicians and seven specialized laboratories. CLU comprises of twenty-one of the cutting-edge devices, in accordance with the research priorities of the QU Vice President's Office for Research and Graduate Studies, based on supporting the current and future development needs of the State of Qatar.

The vision of CLU is to become a role model for national laboratories of international quality in the region. Moreover, it is distinguished by high-quality examinations, the accuracy of results provided, and its leading role in providing services for scientific research, training, scientific and industrial institutions.

At the State's level

"CLU, its labs and infrastructure have been developed, so as to realize its objectives of promoting scientific research activities, through the provision of support to researchers, their plans and projects. CLU aims to provide all the possible scientific and technical support to students' projects, so that they become qualified graduates; by providing high quality training courses and workshops to train



Researchers working at the unit laboratories.

them on the latest equipment with us," said Dr. Mohamed Hussein Al-Safran, Head of the CLU.

Furthermore, CLU provides analytical services to all the national entities and projects, including the underground project, Qatar National Museum, Ministry of Interior's Criminal Lab, Public Works Authority, and Ministry of Municipality and Environment through its agricultural laboratory. It also supports all Qatar Foundation research projects.

"CLU is always working to improve its performance and the quality of examinations constantly, in order to meet the requirements of quality certification standards 17025: 2015 and to maintain the accreditation granted to it from the American Association for Laboratory Accreditation, which was renewed until 2020, through a series of continuous internal and external audits. Further analysis methods are being prepared for CLU", Dr Al-Safran added.

He also said that, "a Nuclear

Magnetic Resonance (NMR) device was installed, which is the first of its kind in the State of Qatar in terms of its capacity; i.e. 600 MHz. It is also a modern and advanced scientific addition to the achievements of QU in the field of scientific and technical research and community service". Moreover, the device goes beyond the task of enhancing the scientific research system within the QU, which is to provide analytical support services to all research and industrial units at the level of the State, serving the State's future development plans.

The fields of examination and testing at CLU include several specializations, including but not limited to Chromatography with all its applications, analysis of heavy elements in solutions and solids using a set of state-of-the-art plasma induction technology coupled with mass spectrometry and spectral emission spectroscopy (ICP-MS & ICP-OES). Also, scanning and penetrating electronic microscopy (SEM-EDX & TEM), having many research and industrial

applications, solid sampling, estimation and significance of the levels of carbon, hydrogen, nitrogen, sulfur and oxygen content therein, areas of examination of solid samples using CLU's different spectroscopies. Determining the effective groups, their inference and assistance in the conclusion of the chemical composition, providing information on many chemical compounds, areas of examination of thermal effects and stability of many chemical compounds, which serves many scientific and applied fields and areas of examination of solid and liquid samples of the Nuclear Magnetic Resonance (NMR) device, where the research of nuclear magnetic resonance is particularly important for the following disciplines:

Chemical and Development Research: organic, inorganic and physical chemistry, chemical industry, biology and biochemistry research, pharmaceutical / industrial Research, agrochemical / industry research, polymer manufacturing, determination of purity of samples, clarification of formation of compounds, identification of chemical composition and material detection and verification, quantitative analysis, as well as quality assurance and quality control tests.

A liquid nitrogen generator (LNG) was recently added to cover all the liquid nitrogen needs of research centers and colleges within the QU, saving a lot of effort and money while providing a free high-quality service.

In case we follow the march of CLU as of 2011 until 2018, we find out that in 2018, it conducted 10,226 samplings with an estimated value of QR 3,231,980, which represents a steady increase in the number of samples.

It is worth noting that the sample population included those from 1616 samples in 2011, 1510 samples in 2012, 3658 samples in 2013, 6175 samples in 2014,



Electronic microscope in the Central Laboratory unit (CLU)

8494 samples in 2015, 4501 samples in 2016 for the renovation of the infrastructure of the CLU's labs, and 9995 samples in 2017. From January to June 2019, CLU conducted 7030 samples under 596 applications received for samplings, representing twice the number achieved during the same period last year (2018), which represented 3940 samples from 402 applications of sampling for 2018.

CLU also provided support and assistance to the research projects supported by various research funds in 2018. In addition, CLU supported 44 projects under the National Priorities Research Program (NPRP), including 12 projects for the Faculty of Engineering, 15 for the Faculty of Arts and Sciences, and 17 for a number of research centers at the State. Moreover, CLU supported 8 projects under the Research Experience Program for undergraduate students, 4 for the Faculty of Arts and Sciences, 2 for the Center for Advanced Materials, 1 for the Faculty of Pharmacy, and 1 for the Faculty of Engineering, as well as 21 internal projects.

Furthermore, CLU supported projects for external institutions such as Texas A&M University in Qatar, Qatar Foundation,

ExxonMobil Qatar, ConocoPhillips, and Qatar Foundation's Solar Cell Co. Cooperation with the University of Texas resulted in two research grants under the National Priorities Research Program of \$ 4 million over the past two years. CLU's researchers published 10 research papers in international scientific journals during 2018, as well as participated in many scientific and training conferences, events and workshops on local and international basis.

During 2018, CLU provided training services to many students, faculty staff, technicians, Qatari school students and researchers of various disciplines in and outside the QU. In addition, CLU's researchers took part in the judging of student projects at the secondary school level at the annual competition organized by Qatar Foundation in cooperation with the Ministry of Education. Such projects encourage the students to take part in international competitions. CLU also supports the Al-Bairaq Program for secondary school students, aiming at enhancing the spirit of scientific research and developing innovative thinking among Qatari school students participating in the project.

Learning Support in the Office of Graduate Studies



Activities of the Learning Support in the Office of Graduate Studies

Writing at the graduate level can be intimidating for students, particularly with regard to scholarly voice and effective use of evidence for synthesis. It is, for most writers, a daunting task to advance research through original /innovative thought.

To further compound these concerns, many graduate students are writing to disseminate their research to a wider, international audience, which often requires students to write in a language other than their native one. Learning Support in the Office of Graduate Studies was established to help students with such issues and other related concerns. Our aim is to support the development of

each student's potential in a way that empowers him/her with both confidence and competence. We aim to help our graduate students develop the strategies needed to read and write as objective researchers. We are here to help our students learn how to use empirical research to support their assertions, to avoid or mitigate potential biases and to inform or convince a wider readership through effective writing. In essence, we are here to help students' master graduate writing, become critical readers and thorough analysts.

Learning Support in the Office of Graduate Studies advances the university's mission to prepare competent graduates destined to

shape the future of Qatar. More specifically, Learning Support is centered on helping graduate students sharpen learning strategies that will develop their capabilities as scholarly writers and lifelong researchers. To this end, we support graduate students by providing a variety of workshops, seminars and training tailored to their specific needs at QU as well as resources, online courses, one-to-one coaching and unique networking opportunities.

Our content addresses everything from writing a literature review, formulating a good research question and training for graduate assistants to SPSS for graduate students,



Dr. Mary Newsome provides direct supervision to ensure the required support is provided to graduate students

getting published and mental health and wellbeing. Our efforts are highly collaborative, drawing on the expertise and commitment of many individuals and units within QU who share a commitment to developing students' capabilities and identities as scientists tasked with the privilege of working towards solutions to global problems.

This year was a very exciting year for Learning Support in the Office of Graduate Studies; we are transitioning to providing all of our content online. For years, we have struggled to pinpoint suitable timings for graduate workshops and seminars, but with hectic work and study schedules paired with family/ social obligations, our students find it difficult to attend as often as they would like.

Our digital library will offer students more flexibility to benefit from useful content and will simultaneously serve as a resource catalog to which students can return repeatedly.

Additionally, we are excited to be actively building a bank of valuable writing and research resources, some of which come from other well-established graduate writing centers and some of which is original material developed by our own learning support team.

We have also recently added to our list of available online courses. We now offer Avoiding Plagiarism (AR-EN), Supervising Doctoral Studies, Human Subjects Protection and Ethics of Scientific Research. All of our online courses are offered through EPIGEUM/Oxford and include a certificate of completion.

Finally, Learning Support in the Office of Graduate Studies has expanded to include three new enthusiastic team members who are passionate about working with grad students on all kinds of projects including theses/dissertations, articles for publication, grant proposals, etc. Our team is bilingual (Arabic-English) and able to work with

students in their preferred language.

We are off to an exciting year of growth with a mission to serve the needs of our graduate students and we are proud to be part of the ecosystem of support that exists at Qatar University.

Visit the below link to the Office of Graduate Studies website to access our library of workshops, lectures, resources and online courses:

<http://www.qu.edu.qa/research/graduate-studies/current-students/graduate-academic-support>

Learning Support in the Office of Graduate Studies is located in the Research Complex (H10), G201. Contact us at gls@qu.edu.qa.

Upcoming tad Events:

tad Writing Hours: Mondays 12:00pm-2:00pm, Research Complex, G119.

tad Bootcamp: Research Complex, January 27th, 28th and 29th, 3:00pm-7:00pm.

tadTalks: April 2020 Research Complex.



Dr. Mohammed Mutlak, author of *Majalis Al-Nour* (Assemblies of light) giving a speech during the Press conference held by the QU Press.

Qatar University Press (QU Press) hosts a press Conference and Signs Contracts with Six Authors

QU Press held a press conference on September 30, 2019 to sign contracts with six authors whom titles are currently under production.

The event was attended by QU President Dr. Hassan Al-Derham, QU VP for Research and Graduate Studies Prof. Mariam Al Ali Al-Maadeed, and QU Press Director Dr. Talal Abdulla Al-Emadi, as well as QU Press authors, members of the Press's

Advisory Board and Editorial Committee, and representatives of the local media.

The titles are: "Assemblies of light in pondering the Holy Qur'an and its interpretation through a new scientific educational method" by Dr. Mohammed Aieash Mutlak Al-Kubaisi and co-authors Dr. Ibrahim Abdulla Al-Ansari, Dr. Mohamed Abubakr Al-Musleh and Dr. Walid Faeq Ibrahim Al-Husseini; "Non-verbal communication in the Qatari culture" by Dr. Montasir Fayeze Al Hamad; "Project management and factors of success" by Dr. Abdullah Kaid Al-Swidi and co-authors Asmaa Abdelwaseh Al-Hussam and Dr. Ahmed Abdel Hadi Mahraz; "Television



A photo of the authors with Prof. Mariam Al-Maadeed and Dr. Talal Al-Emadi, Director of the QU Press.

news report: types, importance, components, language, and standards” by Dr. Fayez Shaheen; “Narrative patterns and functions in ancient Arabic narration” by Dr. Alaa Abdelmonem Ibrahim; “The Arab media and public opinion industry during the Arab Spring revolutions: Al Jazeera channel as an example” by Dr. Abdelsalam Razak, and the “Open a GLAM Lab” book created by a group of sixteen experts from around the world during this past September in Doha.

The seven titles will be showcased at the 30th edition of the Doha International Book Fair (DIBF), which will be held on January 9-18, 2020.

In addition, QU Press currently hosts five open access journals, namely: “Ansaq”, “International Review of Law”, “Journal of Educational Sciences”, “Journal of College of Sharia and Islamic Studies”, and “Tajseer”.

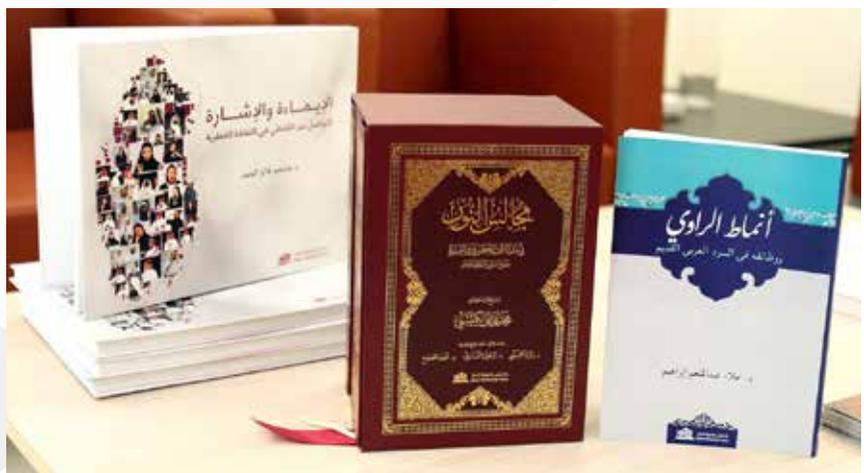
In his remarks, Dr. Al-Derham said: “QU Press is one of the most significant initiatives achieved by Qatar University. It reflects the University’s mission and realizes its vision in line with the Qatar National Vision 2030. The Press seeks to enhance the quality of research and publishing in the State of Qatar. It provides

researchers, authors and academics in Qatar, the region and the world with the opportunity to disseminate their research.”

Prof. Al-Maadeed said: “QU Press is committed to reinforce the academic and research community at Qatar University. The Press endeavors to become a cultural bridge through the publication of research that fulfills the needs of the local and regional society. I would like to appraise the tireless efforts the Press’s team. I would also like to congratulate the authors whom titles have been selected to be published by the Press, following a rigorous peer-review process aligned with the best international standards.”

Dr. Al-Emadi said: “These six titles are the first batch to be published by the Press. They were selected due to their originality and various scientific and academic fields. The Press will increase the visibility of its publications through the participation in local and international exhibitions and through marketing strategy via various contemporary means.”

Dr. Al-Emadi also highlighted that QU Press publishes academic books and journals that are for the benefit of university students, scholars, and researchers in the region and worldwide. “I wish more success and distinction for the Press and its counterparts at the University”, he added.



Qatar University Press publications

