International Ranking: SQU Makes Notable Progress
Expereintial Learning

True learning process should support students in applying their knowledge and conceptual understanding to real-world problems or situations. When students get opportunities to learn in authentic situations on campus or in the community like those provided in internships, field placements, clinical experiences, research and service-learning projects, the learning becomes significantly more powerful. Experiential learning teaches students the competencies they need for real-world success.

Hands-on laboratory science experiences are crucial to the process of learning across all areas of study. Research has shown that students who engage in well-designed laboratory experiences develop problem-solving and critical-thinking skills, as well as gain exposure to reactions, materials, and equipment in a lab setting. Investment in hands-on experiences help inspire students to further their education and prepare them for high-technology careers by fostering skills sought by potential employers.

Hands-on experiences significantly advance learning at all levels of science education when appropriately designed and guided by qualified educators. During hands-on chemistry activities, students directly and safely investigate chemical properties and reactions, utilizing laboratory apparatus and instruments. These activities are essential for learning chemistry and improving science literacy. There is no equivalent substitute for hands-on activities where materials and equipment are used safely and student experiences are guided. Institutions and should make sustained investments to provide the facilities, equipment, curricula, and professional development needed for effective hands-on laboratory science experiences from kindergarten through post-secondary education.

It is good to see that many of the science departments do their best to provide hands on learning experience to their students. The Department of Chemistry at SQU managed to hold chemical analytical instrumentation workshop with the involvement of the private institutions to provide exposure to the students on the use of different types of analytical instruments and proper procedures for operating the instruments. More teaching departments should come out with opportunities for hands on laboratory experiments for students. This will also strengthen academia-industry linkages that would help the students to find more access to the labour market in future.
CAMS Hosts Training Workshop on Brucellosis Diagnosis & Control

The Department of Animal & Veterinary Sciences of the College of Agricultural & Marine Sciences (CAMS) at Sultan Qaboos University (SQU), in association with the Food & Agricultural Organization (FAO), organized a regional training workshop on brucellosis recently. The opening ceremony was held under the patronage of Eng. Mohammed Al Shanfari, Director General of Animal Wealth at the Ministry of Agriculture & Fisheries (MOAF). Dr. Rahma bint Ibrahim Al Mahrooqi, SQU Deputy Vice Chancellor for Postgraduate Studies & Research, and other officials from SQU, FAO, MOAF attended the function.

Speaking on the occasion, Dr. Yasmin El Tahir, Assistant Professor in the Department of Animal & Veterinary Sciences at SQU, said that the workshop is held with utmost importance considering the significance of brucellosis and its impact on humans and animals, as well as its bearing on the economy given the ease of its transmissibility between humans and animals. “Brucellosis causes serious symptoms and largely impacts the economy by the toll on animal health and production. Brucellosis is regularly a notified disease in many regions in the world including the Sultanate and neighbouring countries-in both animals and humans. The disease particularly affects those in contact with animals like breeders, farm workers, and those who consume raw milk and milk products”, she said.

Prof. Isam T. Kadim from the Department of Animal & Veterinary Silences at SQU, said that indigenous livestock is of vital importance to Oman. “Minimizing and eliminating infectious diseases is one of the top priorities in this region. Hence, the workshop on brucellosis diagnosis assumes great significance for the country”, he said. Dr. Michel Claereboudt, Assistant Dean Postgrad Studies & Research, CAMS, congratulated the Department of Animal & Veterinary Sciences for organizing a workshop of brucellosis, which aims at capacity building in the animal wealth sector of the Sultanate.

Dr. El Zein Mustafa El Muzamil, FAO Representative in Oman, said that FAO has been responsible globally for advancing knowledge and experience on brucellosis and assisting countries in development of sound strategies and policies for sustainable control programs and technical support on brucellosis has been given to many countries including Oman. He thanked the SQU for organizing and hosting this workshop and hoped that the event would pave the road for formulation of a comprehensive strategy for surveillance and control of brucellosis in the region. Dr. Ahmed El Idrissi, Senior Animal Health Officer, FAO, provided an account of FAO involvement in the region in the field of animal health in general and brucellosis in particular. The workshop included hands-on training on diagnostic techniques of brucellosis led by Dr. Jay Maryne, Mr. Yannick Corde from Animal Health Laboratory, Bacterial Zoonosis Unit, France, and Dr. Yasmin El Tahir from SQU.

Specialists Discuss Latest Advancements in Obstetrics & Gynaecology

The second International Conference on Advances in Obstetrics & Gynaecology (ICAOG), organized by the College of Medicine & Health Sciences at Sultan Qaboos University was held under the patronage of HE Dr. Ali bin Talib Al Hinaizi, Undersecretary of Ministry of Health for Planning Affairs. The three-day conference examined the research and developments on the latest advances and updates in the field of obstetrics and gynaecology. The conference themes included infertility, gyne-oncology, maternal fetal medicine, and urology-gynaecology. In addition, pre-conference workshops on perineal repair, laparoscopy, obstetric emergency, and hysteroscopy were also held.

Delivering the organizing committee speech at the opening ceremony of the conference, Dr. Tamima Al Dughaishi, Senior Consultant, Maternal & Foetal Medicine at SQU Hospital, said that the conference aims to update health care personnel involved in women’s health on advances in obstetrics and gynaecology. “It seeks to provide a forum for interactive discussion between a panel of international experts and participants. This conference also aims to refine clinical skills at the point of delivery of care through workshops and clinical tips, to promote opportunities for research, and to encourage regional and international collaboration”, she said.

Dr. Maryam Al Shukri, Chair of the Scientific Committee, said that the format of the conference included pre-conference workshops, scientific sessions and poster sessions. “The scientific sessions were held with the following themes: general obstetrics and gynaecology; high-risk obstetrics and maternal foetal medicine; subspeciality gynaecology (gynaecological malignancies, reproductive endocrinology, and minimally invasive gyne-surgery); and medico-legal aspects in obstetrics and gynaecology in Oman. In addition to the scientific sessions, there was an exhibition featuring 44 scientific posters in different updates and research related to obstetrics and gynaecology filed”, she said.

Eleven international speakers shared their knowledge and experience in gynaecology and obstetrics during the event. As many as 300 participants Oman and abroad attended the event. At the opening ceremony, Prof. Neela Al Lamki, Designated Institutional Official Vice President for Academic Affairs, Oman Medical Speciality Board, delivered a talk on the generation gap in medical professionals and the residents of today.
Sultan Qaboos University (SQU) has had some notable achievements in International Rankings this year. The QS Rankings, which began in 2004, ranks universities for their reputation and academic activity.

In the QS World University rankings SQU has climbed from 601-650 in 2014 to 501-550 in 2015. Among the universities from the AGCC nations appearing in 2016, SQU was ranked at number 7. This improvement was partially due to SQU’s score in citations per faculty criteria, which is an indicator of research quality. This means that the number of citations that SQU’s research publications are getting has been improving. SQU took a number of steps in order to achieve in this criteria. In a campus wide campaign, staff members were encouraged to register in international research databases where their research would be more visible. A publication award system was introduced in SQU, where researchers were given monetary benefits if they published high quality research. Collectively, the whole institution was working towards improving the research quality, which has reflected in our ranking.

Times Higher Education (THE) is another highly reputed ranking system, which began in 2004. Similar to QS, THE also measures reputation and academic activity of universities but it does not stop there. It takes into account emphasis on postgraduate studies and the relations of the university with industry.

Methodology of the Times Higher Education (THE) World University Rankings In 2016, SQU was ranked in THE rankings for the very first time getting a position of 601-800. Times Higher Education also has more focused rankings like the ‘BRICS and Emerging Economies’ Rankings. BRICS stands for Brazil, Russia, India, China, and South Africa. These are considered as the major emerging economic giants. The ranking also includes countries that are classified as Emerging Economies by FTSE, which stands for Financial Times Stock Exchange group, specializes in finance and global financial outlook. Oman is considered as an Emerging or Frontier Market along with 24 other countries by FTSE. Combined with the BRICS nations the total countries involved in this ranking are 30. Again for the very first time SQU was ranked at a position of 109 in this ranking among the universities of these 30 nations. SQU also appeared on the 3rd position among universities of the GCC countries and also the Arab world appearing in this ranking.

Internationalization is considered as one of the most important aspect for the success of educational institutions. It is a factor that is considered in almost all reputable rankings. In January 2016, Times Higher Education published a new ranking called the ‘World Most International Universities’. This ranking looks at each institution’s proportion of international staff, proportion of international students, and proportion of research papers published with at least one co-author from another country. In this ranking, SQU was ranked 166 in the world.

Ranking is a process or system of classifying global higher education providers such as universities and research centres based on their performance in a combination of research and teaching activities. The total number of such organizations is difficult to determine but UNESCO provides a figure of about 16,000 globally. There are many rankings present internationally some reputable rankings are Times Higher Education (THE), QS, and the Academic Ranking of World Universities (ARWU). In general, all the rankings measure crucial aspects such the activity and impact of universities, or Higher Education Institutions (HEI) and research centres. However, the indicators that are used to measure activity and impact vary from one ranking system to another. For example, one ranking may give more importance to the quality of education while another may only look at research activity. Some ranking may be interested to see how much money you gained from industry and another ranking may be interested in how many international staff you have in your institution.

The ranking phenomenon has grasped the higher education world! Famous universities of the world and especially from the developed world have enjoyed an unchallenged reputation for a long time now. With the relative new shift in the international economic balance towards the east, countries there are investing heavily into universities to enhance education and research; this has led to the creation of very strong worldwide competition. Soon it became evident that reputation and history cannot be the basis for evaluating the quality of education that a university provides. This prompted the international community to rethink the factors that define an excellent university.

Rankings have their advantages and disadvantages. Universities can focus too much on getting a better ranking position and completely neglect their major objectives of giving and creating knowledge. Therefore, it is very important that a balanced strategy for rankings is adopted so that it helps the institution to improve but does not deviate it from its ultimate goal.

Sultan Qaboos University

Sultan Qaboos University (SQU) adopts a very balanced approach to rankings. It utilizes it for comparing its overall performance of an institution with respect to others around the world, and determining its strengths and weaknesses. Planning and policy making in the long term incorporate aspects of rankings, SQU believes that rankings add prestige to an institution, inculcate institution loyalty, installs national pride and is important in attracting high calibre staff and students. Overall, this helps in developing healthy competition between institutions both locally and internationally and helps institutions to improve.
Student-Centered Learning: EFL Students’ Perceptions

On-going research in education is focusing on exploring various approaches driven by a growing concern of ideal teaching and learning methods. Student-Centered Learning (SCL) is characterized by innovative methods of teaching and it has been promoted to support the rapidly changing education environment. Dr. Salma Al Humaidi from the Curriculum & Instruction Department of the College of Education conducted a study that investigated EFL (English as a Foreign Language) students’ perceptions of practicing SCL in the teaching and learning process at Sultan Qaboos University. Data was gathered through a survey from 57 EFL students studying at SQU. Results showed that the different dimensions of Student-Centered Learning are used to significantly varying degrees. The findings of this study were published in Macrothink Institute International Journal of Education, 2015, Vol. 7, No. 3.

Students of the 21st century are expected to have life and career skills, learning and innovation and information and communication technology skills. Consequently, the unwavering responsibility of educators is to ensure that these skills are promoted especially in higher education institutions. Teaching and learning methods, approaches and techniques are constantly evolving to meet these needs. Student-Centred Learning (henceforth SCL) has been promoted to support the rapidly changing education environment.

SCL is characterized by innovative methods of teaching which aim to promote learning and take students as active participants for their own learning. SCL is based on active learning and ongoing reflection, cooperation between students and instructors, higher-order thinking skills, students’ choices and control over their learning, students’ different experiences and background knowledge, and students’ diversity. Examples of teaching methods in SCL are: lecture with discussion, class discussion, online discussion, case studies, discovery learning, learning centers, simulations and role-plays. Students’ projects in SCL may include writing papers, essays and reports, individual and group projects, conducting research, answering open-ended questions and organizing events. There are differences between SCL and Teacher-Centered Learning (TCL).

Dr. Salma’s study aimed at investigating the practicing of SCL in the teaching and learning process at SQU as perceived by EFL students. Data was gathered through a survey administered to 47 undergraduate students in the third and fourth years of the English Language Teaching program in the College of Education at SQU. Results showed that some central aspects related to SCL received low and moderate mean values. This was especially true for students’ involvement in the educational process, teacher’s roles, assessment, some teaching methods, and goals and objectives.

The study showed that some crucial roles of teachers such as providing multiple means of accessing information, acting as facilitators, challenging and motivating students, being open and empathetic, using real-life problems and case studies to structure the subject matter, and helping students to use critical thinking skills- and some teaching methods were moderately practiced at SQU. This may indicate a need for teachers to help promote the facilitation of appropriate learning experiences for students in order to implement SCL more effectively.

Similar to teacher’s roles and teaching methods, assessment is another major issue in SCL that deserves more and careful attention. In the study, some crucial aspects in assessment received moderate mean values. Some researchers confirm that there is a possibility that the assessment method may not be in line with the teaching methods. In some contexts, even when SCL is incorporated, the assessment method remains 80% examination based.

Other aspects that needed more attention and found to be implemented at moderate and low levels at SQU, are students’ involvement in the educational process, and goals and objectives. This calls for more support of students’ involvement in the educational process at both course and program levels. However, when specifically asked about their perceptions of some aspects related to SCL in the dimension “learning outcomes”, the students reported positive perceptions. This finding contradicts the findings of another study (Emeanyeouno, O. C. (2012). Student-Centred Learning in Oman: Challenges and pitfalls. International Journal of Learning and Development, 2(5), 243-254.) that investigated SCL in one of the higher education institutions in Oman and found that students had poor perceptions of SCL. Due to this contradiction, further investigation is needed to help clearly understand this issue in the Omani context.

To conclude, at a university level, student-centered teaching and learning activities are usually followed at different degrees. This study revealed that there is some attempt to implement SCL at SQU; however, some important aspects related to SCL received moderate and low mean values. It may be that there are some contextual constraints that hinder more effective implementation of SCL confirm that there are interplay of factors such as learners’ perceptions, attitudes and their characteristics, length of time needed, the appropriate instruments to be used, how student-centered approaches are to be implemented, teacher professional capacity, available resources, and cultural factors. More studies are therefore required for better understanding of SCL at SQU.

Recommendations for further research may include: 1) a replication of this study using a bigger sample and different majors in the college of education and other colleges at SQU, 2) a study that examines the perceptions of teachers about their own teaching and SCL which would help reveal interesting findings that may support or contradict students’ perceptions, and 3) a study that uses various research instruments and tools, such as questionnaires, observation and other tools like document analyses to ensure more reliable findings.
SQU Receives Bethel University Delegation

A nursing faculty-student delegation from Bethel University, St. Paul, Minnesota, USA, visited Sultan Qaboos University, to explore academic and research ties between the two institutions in nursing and related disciplines. The delegation consisted of Bernita Missal, Professor of Nursing, and Dave Muhovich, Associate Professor of Nursing, and 11 nursing students.

The delegation was received by the officials from the International Relations Office at SQU and later by academics at the College of Nursing. The two sides discussed on strengthening the ties between the institutions through student and faculty exchange and by undertaking joint cross-cultural research in nursing. The US university delegation later visited SQU Cultural Centre. The visit of the delegation is also aimed at introducing the Omani culture to the nursing students at Bethel University. Bethel University is a top-ranked, evangelical Christian university based in St. Paul, Minnesota. The Department of Nursing at Bethel University enjoys state-of-the-art labs, cross-cultural service opportunities, and access to master’s degrees in nursing and nurse-midwifery, making it an exceptional school to prepare for a nursing career. The nursing program has strong relationships with over 30 clinical agencies, including all major health systems in the Minneapolis–Saint Paul Twin Cities area and more than seven public health departments.

SQU Holds Training Program

In collaboration with the Directorate General of Inquiries and Criminal Investigations of the Royal Oman Police, the College of Law and Community Service Center at Sultan Qaboos University organized a training program for the students of the college about the inquiries and criminal investigations, which lasted for one week at the college’s halls.

During the program, specialized police officers from the Directorate General of Inquiries and Criminal Investigations delivered lectures about the tasks of the Royal Oman Police to combat different type of crimes, the rights and guarantees of the accused during the evidence-gathering stage, scenes of the crime, duties and assignments of information management division, criminal analysis, lab management, and criminal evidence. The College of Law organizes specialized lectures and training programs of this kind on a regular basis, in coordination with the public institutions to improve students’ experiences and strengthen their legal knowledge.

ILC to Organize Series of Workshops

“The Pre-Innovators Incubator” is a service provided by the Independent Learning Centre at SQU to create needed environment for the students to flourish and bloom, by highlighting their track to the world of innovation and creativity. The Pre-Innovators Incubator was launched in summer 2015, offering the first summer activity at SQU in the framework of the Solar Energy Workshop delivered by Prof Wen Chang of the National Dong Hwa University Energy Technology Center in Taiwan.

The closing ceremony of the winter 2016 workshop on Renewable Energy (Photovoltaic System Design and simulation) organized by the Pre-Innovators Incubator at the Independent Learning Center in Sultan Qaboos University, was held on 19 Jan 2016 under the patronage of H.E. Dr. Hilal bin Ali Al Hinai, the Secretary General of the Research Council.

Speaking on the occasion, Dr. Magda Al Hinai, Director of the Independent Learning Centre, stated that the Centre runs the pre-innovators incubator on a themed basis, in an attempt to fulfil the needs of the job market and the development of our country. “The first theme for the pre-Innovators Incubator is Renewable Energy. Starting this spring, we are launching workshops on biofuels, another topic in renewable energy. The second theme for the pre-innovators Incubator, to start in spring 2016 is mining and minerals. Other themes like fisheries, agriculture, mining, tourism, banking, education, cloud computing, etc. are on our agenda”, she added.

“In view of the positive feedback for the pre-Innovators incubator workshops and owing to the high demand of these workshops, the Independent Learning Centre announced the launch of two new incubators. The first one is the education knowledge development incubator with its first theme “special needs education” for this spring semester to be followed by the second theme “early childhood education”. The second incubator is the IT incubator, which covers the recent advances in IT. During this spring the Centre would offer workshops on cloud computing and raspberry Pi”, Dr. Magda Al Hinai said.

Speaking on the occasion, Dr. Mohammed Al Badi, Assistant Professor in the College of Engineering, said that renewable energy should be an essential component of the national and global energy supply mix. “It can be used as a global strategic option for both extending the life of oil and gas reserves as well as reducing greenhouse gas emissions and thus combating climate change. In Oman, renewable energy is gaining a big momentum and we hope that this will continue. There are a lot of opportunities for innovation in this field”, he added.
The quest to construct a silicon-based artificial brain is as old as the humans’ desire to explore the planets beyond our earth in the solar system. In 1946, when a professor of mathematics at Princeton University (USA) named John von Neumann proposed “control-flow” model of computation (which dominates the architecture of today’s computing systems), he certainly had no idea that his model would remain in practice for the next 69 years. The computer since then has evolved from a mere calculating machine to a ubiquitous device found in every household and business establishment but the heart and organs pulsating in its body remain virtually the same as von Neumann had proposed several decades ago. This ancient model of computation is beset with limitations when it comes to exploiting parallelism to the utmost limit and has been a subject of debates among the computer architects. In 1966, Karp and Miller proposed an alternate parallel model of computation called data-flow and a few experimental computer systems based on this model were designed at MIT in the USA, University of Manchester in the UK, and the Elektrotechnical Laboratories in Japan. However, with billions of dollars already invested by large companies on manufacturing components for the von Neumann’s type computers, dataflow model of computation could not garner enough academic and financial support to survive and remained in experimental stage for a long time until it became a forgotten idea.

The ultimate achievement of the computer architects of tomorrow will be judged based on our success in building a system, which can mimic the best natural computing machine called the human brain. Despite having spent millions of dollars in USA and Europe on various projects aimed at developing computing systems (based on von Neumann’s model of computation) which will help us win the brain-imitation game, in the words of an IBM scientist, Dharmendra Modha, “There are no computers today that can even remotely approach the remarkable feats the mind performs.” In Switzerland, scientists working on the Blue Brain Project since 2005 to build the virtual brain, have so far succeeded in simulating, using IBM BlueGene/L supercomputer, only a rat’s brain, which is the size of a pinhead and has about 100,000 cortical columns, with each column having about 10,000 neurons. In comparison, human brain has two million cortical columns, each column with about 100,000 neurons. In my opinion, we’ll never be able to build a human-brain imitating machine with the tools and models which were developed almost 69 years ago based on the technology available at that time, and the key to solving this mystery lies in complete abandonment of the beliefs we were raised with as computer architects of the last century.

In 1995, another model of computation was proposed in the scientific literature based on the amalgam of data-flow model and the concept of content-addressability found in human brain. This visionary idea has prompted researchers to revisit and question the very foundation of modern computing, i.e., number system, computational model, and the storage technology used in today’s computers. Current binary representation of a number does not allow representation of a multi-dimensional entity as a single binary string so a new number system called complex binary number system has been proposed which can allow a two-dimensional number (complex number) to be represented as stored as single binary string of 0s and 1s.

The traditional sequential control-flow computational model is devoid of inherent parallelism, which is the fundamental characteristic of a human brain, and this is where the associative dataflow model appears which is based on content-addressability and the parallel nature of the dataflow model. A content-addressable memory, also called associative memory, incorporated within the computer system is more suited to play the imitation game than the random-access memory found in today’s computers. Research work is currently underway at Sultan Qaboos University, which is expected to leapfrog computing technology into a realm where the human thought can be processed in a silicon-based environment and the time will come when surgeons will be implanting silicon-based integrated-circuit chips within the human body.
Biochar has a Multitude of Benefits

Prof. Muhammad Arshad

Prof. Muhammad Arshad is the Dean of the Faculty of Agriculture at the University of Agriculture, Pakistan. He did his Ph.D. in Soil Microbiology and Biochemistry from the University of California, Riverside, USA. Dr. Arshad also served as Editor-in-Chief, Pakistan Journal of Soil Science and President Soil Science Society of Pakistan. He has been visiting scientist for four times at the Department of Environmental Sciences in the University of California, Riverside, USA. As Soil Microbiologist, his major focus of research is the development of biofertilizers for sustainable agricultural production. In recognition of outstanding performance in education and research, the President of Pakistan conferred Dr. Arshad with National Civil Award “Tamgha-i-Imtiaz 2005”. During his recent visit to SQU, Dr. Arshad gave three talks on composting and biochar at a workshop on this topic organized by the College of Agricultural & Marine Sciences.

Can you give an overview of your institution?

Prof. Arshad: The Faculty of Agriculture is the biggest faculty in the University of Agriculture, Faisalabad by both infrastructure and the students' strength. Academically it comprises six departments and two institutes, namely the Institute of Soil & Environmental Sciences and the Institute of Horticultural Sciences. The faculty enjoys a profound interaction with farmers and other stakeholders and with its alumni through Farmers Syndicate Hall. The faculty is the most sought after agricultural faculty in Pakistan. Apart from that, it has earned global reputation as an esteemed learning place for overseas students from all lingual and ethnic human groups. The faculty, over the time, has trained more than 11,000 undergraduate and 6000 postgraduate students in various disciplines of agriculture.

Can you explain the benefits of biochar and value-added compost in agriculture and its environmental benefits?

Prof. Arshad: Biochar, a valuable soil amendment, is produced by converting agricultural waste into a soil enhancer that can hold carbon, boost food security, increase soil biodiversity, and discourage deforestation. The process creates a fine-grained, highly porous charcoal that helps soils retain nutrients and water. Biochar will be effective in achieving food security and cropland diversity in arid areas like the Gulf region and areas with severely depleted soils, scarce organic resources, and inadequate water supplies. Biochar and bioenergy co-production can help combat global climate change by displacing fossil fuel use and by sequestering carbon in soil carbon pools. It may also reduce emissions of nitrous oxide (Green House Gases Emission). Compost is one of the oldest technology used by the farmers for keeping their soils healthy. Through the biological process, organic waste is transformed into useful soil amendments while improves soil health substantially. Recent advances in this field has led to formulation of effective nutrient, hormone, vitamins and beneficial bacteria enriched products for enhancing agricultural productivity. Such products are not only economically but also environmentally safe.

Do you think that this technology (Biochar and value added compost; organic fertilizer) will be appropriate for Oman?

Prof. Arshad: Biochar is made from biomass waste materials including crop residues such as coconut shells, fruit pits, as well as yard, food and forestry wastes, animal manures and sewage sludge. In Oman, date palm waste is abundant. The huge amounts of date palm wastes are usually buried in landfills or burned directly in open fields. This can cause serious threat to the environment and human health. If large amounts of agricultural biomass are burned or left to decompose, it results in release of CO2 and methane back into the atmosphere. They also can pollute local ground and surface waters. Using these materials to make biochar not only removes them from a pollution cycle, but biochar can be obtained as a by-product of producing energy from this biomass. Hence, if date palm waste is used for the production of biochar, it will be beneficial to the agriculture sector in the country and environment at large. Soil salinity and salt-water intrusion are major challenges for agricultural sector in Oman. However, the use of biochar improves water quality by helping to retain nutrients and agrochemicals in soils for use by plants and crops, resulting in less pollution. Similarly, the formulation of organic fertilizers from compost could be extremely useful for Omani soils while considering texture, structure and extreme climatic conditions of this region. Moreover, the environmental pollution caused by various types of organic waste could be minimized by the conversion in to effective and useful amendments. So, both the products, if used simultaneously, can give marvelous results in Omani soils.

What is the difference between biochar and compost?

Prof. Arshad: Biochar is produced when wood, leaves and other organic materials are heated with little or no air. This process is called pyrolysis. The material left over after this process is a charcoal and is referred to as biochar. Carbon is the main constituent of biochar. Compost is produced when bacteria, yeast and fungi breakdown organic materials by aerobic decomposition. Composting accelerates the natural biodegradation of organic materials, producing more stable forms of organic matter. These stable products contain carbon and nitrogen as well as many other nutrients. Compost is applied to plants and is relatively rich in nutrients as compared to biochar while the latter has greater potential to retaining nutrient microbial community and C-sequestration ability than former.